

AFRICAN HERP NEWS

NO. 14 DEC 1990

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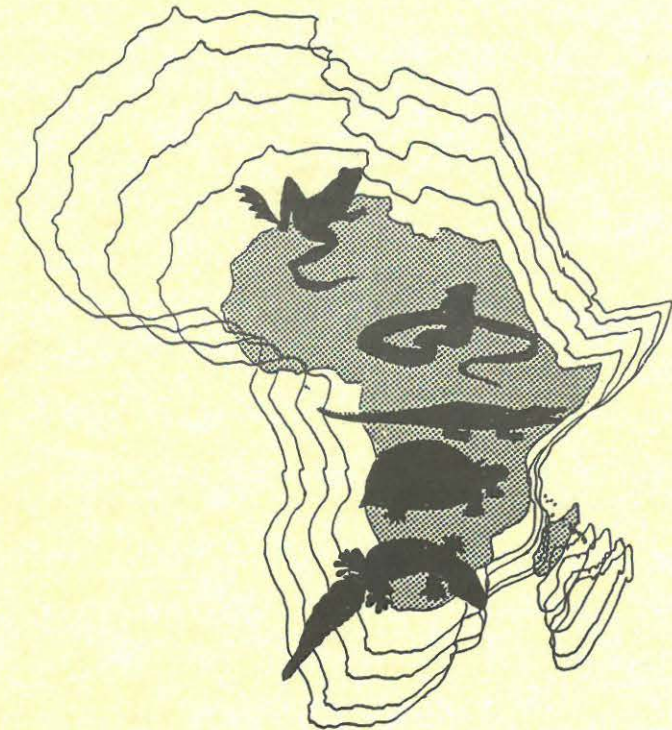
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AFRICAN HERP NEWS

HERPETOLOGICAL ASSOCIATION OF AFRICA

NEWSLETTER



DECEMBER 1990

NO. 14

HERPETOLOGICAL ASSOCIATION OF AFRICA

Founded 1965

The HAA is dedicated to the study and conservation of African reptiles and amphibians. Membership is open to anyone with an interest in the African herpetofauna. Members receive the *Journal of the Herpetological Association of Africa* (which publishes technical articles- subject to peer review, notes, book reviews and bibliographies) and *African Herp News* (HAA Newsletter), which includes news items, husbandry hints, announcements, etc).

COMMITTEE OF THE HERPETOLOGICAL ASSOCIATION OF AFRICA

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Honorary Life Members: Dr R. Laurent, Prof. J.C. Poynton, Dr Carl Gans, Dr D.G. Broadley.

EDITORIAL

As most of you probably know by now, the *Second H.A.A. Symposium on African Herpetology* will take place at the National Museum in Bloemfontein from 8-11 April 1991 (see announcement on page 2).

To date, titles have been received for 31 papers, 8 posters and 2 slide shows. It is quite surprising however, to note that only 8 papers deal with reptile husbandry. Surely there are more husbandrists around?

At this stage four Guest Speakers have been invited to the Symposium. They are Prof. J.C. Poynton (University of Natal), who is perhaps best known for *The Amphibia of southern Africa: a faunal study* and the four part series *Amphibia Zambesiaca* (with Dr D.G. Broadley as co-author); Mr. Bert Langewerf (Agama International Herpetocultural Institute, United States of America), who is currently building up the world's largest lizard breeding farm and who has, so far in 1990, bred 750 lizards; Dr. D.G. Broadley (Natural History Museum of Zimbabwe), who revised *FitzSimon's Snakes of southern Africa* and has reviewed and revised numerous African snake and lizard genera; and well-known herpetologist Prof. Aaron Bauer of Villanova University, United States of America. With Guest Speakers like these, how could anyone dare miss the Symposium?!

Regarding the H.A.A. General Meeting, to be held during the forthcoming Symposium, I would like to remind members that any amendments to the H.A.A. Constitution which they may want to discuss, must be submitted to the Secretary in writing by 8 February 1991 (see *African Herp News* 13: 5-14).

Finally, I would like to thank those persons who contributed articles and news items for this issue of *African Herp News*.

All the best for 1991.

Mike Bates
Chairman/Newsletter Editor



SECOND HAA SYMPOSIUM ON AFRICAN HERPETOLOGY

**NEW VENUE: NATIONAL MUSEUM, BLOEMFONTEIN
8-11 APRIL 1991**

You are cordially invited to attend the second major symposium of the *Herpetological Association of Africa*, to be held at the National Museum in Bloemfontein.

Due to the slow response to Intention Forms sent out in August 1990, and in order to keep the registration fees below R250-00 the venue of the symposium has been changed from the University of the Orange Free State to the National Museum.

If you have returned a previous Intention Form it is not necessary to return the enclosed Intention Form. However, please note the change in venue and accommodation arrangements. Please return the enclosed Intention Form by 15 January 1991.

Members not returning an Intention Form will not receive further notifications.

REGISTRATION FEES

H.A.A. Members (fully paid up 1990)	R150-00
Non-members	R180-00
Daily tariff (members and non-members)	R 60-00

Registration forms will be sent out in January 1991. Payment by postal order or cheque to be made out to HAA Second Symposium and posted to H.A.A. Secretary/Treasurer, P.O. Box 266, Bloemfontein, 9300, R.S.A.

ACCOMMODATION

Accommodation will no longer be available at the University of the Orange Free State hostels. Delegates should organize their own accommodation. A map of Bloemfontein will be sent out

at a later date. The following is a list of hotels/overnight accommodation within walking distance from the Symposium venue:

Hotels and ratings	Approximate Tariffs
BLOEMFONTEIN SUN **** East Burger Street (051) 301911	Single 155.00 bed only Double 103.00 p.p. bed only
HOLIDAY INN *** Union Avenue (051) 301111	Single R155.00 bed only Double R100.00 p.p. bed only
HALEVY HOUSE *** Markgraaf Street (051) 480271	Single R85.00 bed only Double R105.00 bed only Breakfast R7.50 - R12.50
STANVILLE THE INN ** (Self-contained) Zastron Street (051) 477471	Single R55.00 bed only Double R34.50 p.p. bed only Breakfast R12.50
DIE HERBERG ** (self-contained) Barnes Street (051) 307500	Single R45.00 bed only Double R65.00 bed only Tea and Toast R3-00 Light breakfast R7-00 Full breakfast R10-00
CECIL HOTEL ** St. Andrew Street (051) 481155	Single R55.00 b + b Double R32.00 p.p. b + b
FONTEIN HOTEL * Zastron Street (051) 484791	Single R45.00 bed only Double R29.00 p.p. bed only Breakfast R7.91

N.B.: Tariffs expected to increase by 7,5-10% before April 1991. All tariffs excluding GST.

PAPERS, POSTERS AND SLIDE SHOWS

You are invited to present a paper, poster and/or slide show. Please indicate your preference and supply a provisional title on the Intention Form. Papers and/or abstracts (including those of posters) will be published in a future *H.A.A. Journal* if so desired by the author/s.

GUEST SPEAKERS

Prof. J.C. Poynton (University of Natal)

Provisional title: *Amphibian diversity and species turnover in southern Africa.*

Burt Langewerf (Agama Institute, United States of America)

Provisional title: *The maintenance and care of lizards in captivity.*

Dr. D.G. Broadley (Natural History Museum of Zimbabwe)

Dr. Broadley's attendance at the Symposium still to be confirmed.

Prof. Aaron M. Bauer (Villanova University, United States of America)

Provisional title: Still to be submitted.

IMPORTANT DATES

Final announcement and registration form to be sent out - January 1991.

Final date for return of abstracts - 15 February 1991.

Final date for registration - 30 February 1991.

**ENQUIRIES AND ADDRESS FOR INTENTION
FORMS**

Mike Bates

HAA Symposium Organizer

National Museum

P.O. Box 266

Bloemfontein, 9300

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Tel. (051) 479609

HAA Symposium Committee:

Mike Bates, Rod Douglas and

Alex Flemming

National Museum

P.O. Box 266

Bloemfontein, 9300

PAPERS

Baard, E.H.W. Dynamics of a Geometric tortoise population in the southwestern Cape Province.

Baard, E.H.W. Estimating the size of terrestrial tortoise populations: two case studies.

Bates, M.F. The herpetofauna of the Orange Free State.

Bauer, A.M. & Branch, W.R. The status of *Phyllodactylus peringueyi* (Reptilia: Gekkonidae).

Bodhijl, T. Research on the Gaboon Adder, *Bitis g. gabonica* in Zululand.

Branch, W.R. *Homopus* "bergeri"- a new land tortoise from the rocky mountains of southern Namibia.

Burger, M. Tortoise mortalities along electric fence on Thomas Baines Nature Reserve.

Channing, A. The "oh, ah" effect: Zoogeography of the Kassiniinae.

Douglas, R.M. The genus *Bradypodion* in the Orange Free State.

Flemming, A.F. The reproductive cycle of the viviparous lizard *Pseudocordylus m. melanotus* (Sauria: Cordylidae) in the Orange Free State.

Haacke, W.D. Topic: systematic zoogeography.

Haagner, G.V. Notes on the captive propagation of the Rough-scaled plated lizard, *Gerrhosaurus major*.

Haagner, G.V. & Morgan, D.R. Captive propagation of the Intermediate shield-nose snake (*Aspidelaps scutatus intermedius*) with notes on reproductive behaviour and growth.

Haagner, G.V., Patterson, R.W. & Morgan, D.R. Captive propagation of the South African rock python, *Python sebae natalensis* in South Africa.

Herselman, Yolande M., Mouton, P. le F.N. & Van Wyk, J.H. The genera of the family Cordylidae as paraphyletic taxa.

Jacobsen, N.H.G. Transvaal *Afroedura*.

- Lambiris, A.J.L.** A re-assessment of frog taxonomy in South Africa.
- Langewerf, B.** The maintenance and care of lizards in captivity.
- Marais, J.J. & Smith, G.A.** Topic: crocodiles.
- Morgan, D.R. & Haagner G.V.** The captive propagation of the Lowland viper (*Atheris superciliaris*).
- Morgan, D.R. & Haagner, G.V.** The Manyeleti Reptile Centre - a different approach to reptile husbandry and research.
- Mouton, P. le F.N. & Van Wyk, J.H.** Evolutionary tendencies in the function of colour in the lizard family Cordylidae.
- Passmore, N.** Male calling behaviour in *Hyperolius marmoratus*.
- Patterson, R.** Reproduction and husbandry of *Python sebae natalensis*.
- Poynton, J.C.** Amphibian diversity and species turnover in southern Africa.
- Smith, G.N.** Season of calling and associated control factors of a northern Transvaal anuran population.
- Spawls, S.** Activity patterns in nocturnal West African savanna snakes.
- Tomsett, G.** Checklist of the reptiles of the West Coast National Park.
- Van Heerden, A.J., Mouton, P. le F.N. & Van Wyk, J.H.** Description of a contact zone between the lizard species *Cordylus cordylus* and *Cordylus niger*.
- Visser, J.** Sperm of some South African frogs.
- Visser, J.** The "large-eyed" *Lamprophis fuliginosus* from the arid areas of the Cape Province and Namibia.

POSTERS

- Badenhorst, N.C., Mouton, P. le F.N. & Van Wyk, J.H.** Climates associated with the occurrence of melanistic cordylid populations in the southwestern Cape.
- Boeyens, L.S., Van Wyk, J.H. & Mouton, P. le F.N.** The involvement of cordylid femoral glands in reproduction.
- Herselman, Yolande M., Mouton, P. le F.N. & Van Wyk, J.H.** The status of the races of the graceful crag lizard *Pseudocordylus capensis*.
- Jacobs, S., Van Wyk, J.H. & Mouton, P. le F.N.** Geographical patterns in the incidence of glandular epidermal structures in cordylid lizards.
- Lambiris, A.J.L.** Surgical repair of chelonian shell defects.
- Van Wyk, J.H.** Synchrony of male and female reproductive cycles in *Cordylus giganteus*.
- Van Wyk, J.H.** The frequency of reproduction in females of *Cordylus giganteus*.
- Van Wyk, J.H. & Mouton, P. le F.N.** Glandular epidermal structures of cordylid lizards.

SLIDE SHOW

- Spawls, S.** Slides of African reptiles and amphibians.

Channing, A. Some little known tropical frogs.

NAME (and title)

.....

POSTAL ADDRESS:

.....

POSTAL CODE:

Tel (H) (W).....

I am interested in attending the following days of the Symposium and would like to receive further information.

8	9	10	11	12
Apr	Apr	Apr	Apr	Apr

INSTITUTIONAL NEWS

CURRENT HERPETOLOGICAL RESEARCH AND RELATED ACTIVITIES IN NAMIBIA

Namibia has a wide diversity of landscape and a broad herpetofaunal diversity to match. At last count, 52 species of frogs and 222 species of reptiles occur or are expected to occur here. The greatest diversity of frogs and amphibious reptiles are found in the Caprivi strip as one would expect, and the Namib Desert hosts the largest diversity of endemic and near-endemic reptiles; fully 90% of Namibia's endemic herpetofauna (mainly Gekkonidae) are from the Namib, pro-Namib and adjacent areas.

Past workers have had a great interest in the Namib Desert, more so than any other area in Namibia, and this in-part led to the establishment of the Namib Desert Research Station at Gobabeb in 1963. The presence of this station has ensured that the momentum created by earlier researchers would be sustained. The station has been involved with studies which have led to approximately 40 papers on Namib Desert herpetology, about 8% of the station's entire output.

The State Museum of Namibia houses the national collection, and very occasionally houses a national herpetologist as well. During the past 20 years, herpetologists have been in residence for a total of only four years. Consequently, most recent work has been done by visiting foreign scientists. This historical situation is also reflected in the paucity of type material lodged in the museum; of Namibia's 27 species of endemic herpetofauna, only 6 species are represented by holotype or paratype material. The State Museum currently houses 7 500 reptile specimens and 850 amphibian specimens, and is being curated by R.E. Griffin (Curator of Arachnids, Myriapods and Lower Vertebrates).

Current activities involving Namibian reptiles and amphibians can be split into three broad categories: 1) Research conducted by the Ministry of Wildlife, Conservation and Tourism, this being conservation orientated, 2) commercial enterprises (three crocodile farms are active in Namibia, and one reptile park is now under construction), and 3) research conducted by local and foreign visiting scientists, which is usually academic in nature. Below is a list of active programmes in the latter category.

Comparative Reproductive Biology and Behavioural Ecology of *Agama aculeata* and *Agama planiceps* in the Windhoek area, N. Heideman (University of Namibia). A long-term programme.

Ecological Physiology of the Savannah Monitor, *Varanus albigularis*, J.A. Phillips (Center for Reproduction of Endangered Species, Zoological Society of San Diego). An 18-month study centered in the Etosha National Park.

Ecophysiology and Biology of *Angolosaurus skoogi* in the Northern Namib Dunes, M.K. Seely (Desert Ecological Research Unit, Gobabeb). A broad spectrum and ever-evolving long-term programme, involving a number of specialist visiting scientists, in particular D. Mitchell (University of the Witwatersrand) and B. Clark (University of

Cape Town) who is now conducting full-time lab and field work on the physiology of this lizard toward a PhD degree.

Herpetology of the Namib Desert west of the 100 mm Isohyet, W.D. Haacke (Transvaal Museum). A long-term opportunistic and comprehensive study started in 1963.

Two new projects have recently been registered, but as yet are still in the infant stages (in Namibia at least): Communication and Social Behaviour in Barking Geckos (*Ptenopus*), S. Telford (University of Cape Town), and Evolution of the Bufonidae in Southern Africa, M. Cherry (South African Museum).

Several other herpetologists visit Namibia irregularly and opportunistically: A.M. Bauer (Villanova University), Investigation of the Phylogenetics, Systematics, Historical Biogeography, and Evolutionary Morphology of the Herpetofauna of Southern Africa, with special reference to the family Gekkonidae; A. Channing (University of the Western Cape), Biogeography and Systematics of Southern African Anura; K. Nagy (University of California, Los Angeles), Ecophysiology of Desert Reptiles; P. Freed (Houston Zoo) Parasitology, and Husbandry of Southern African Reptiles. In addition, several local Southern African herpetologists are working on Namibian fauna as part of their broader-based surveys, i.e., D.G. Broadley & J.C. Poynton in their Amphibia Zambesiaca; D.G. Broadley in his various revisions of Southern African genera, and as reviser of "FitzSimons Snakes", as well as including the Caprivi Strip in his Herpetologica Zambesiaca; and W.D. Haacke, and W.R. Branch, in their broad Southern African surveys.

Herpetological research in the Ministry of Wildlife, Conservation and Tourism (formerly the Department of Agriculture and Nature Conservation) is conducted by myself, the Small Animal Biologist. This is not a full-time assignment though, as I also have 140 species of small mammals and approximately 250,000 species of invertebrates to look after. The main thrust of our research is to define the "conservation status" of all these species, and to monitor species of conservation concern. Since the taxonomic status/systematic placement of a taxon is the first point in defining a species' conservation status, considerable effort is now being put into this aspect. Detailed taxonomic and/or biogeographical studies are currently underway with *Aporosaura*, *Meroles* and *Pedioplanis* (with D. Gordon, formerly of the Transvaal Museum), *Homopus bergeri*, *Python sebae* and *Python anchietae* (with W.R. Branch), Namibian *Cordylus* species (with P. Le F. Mouton), and Namibian frogs (with A. Channing). Red Data Books are now in preparation and will define the conservation status of every species of Namibian reptile and amphibian.

Surveys of reptiles and amphibians are being conducted in all Namibian Conservation areas, with the aim of producing guide books for each area. Each guide book will be detailed enough to be of use to local conservation staff and visiting scientists, and general enough to be of interest to tourists as well. An additional long-term project is to produce a monograph on Namibian lizards.

The problem of the Eastern National Water Carrier (canal) was reported on earlier (see *J. Herp. Assoc. Afr.* 36: 36-37). The problem still exists as no practical method has

yet been found to exclude local wildlife from the canal. We are currently testing a number of structures, several of which show promise. Mortality rates are intensively measured twice a year, during winter and summer.

We are also engaged in a *Python anchietae* captive-breeding programme, which is a joint venture with the Transvaal Snake Park. Our involvement revolves around our desire to make captive-bred specimens available to foreign research and educational institutions, and to supply specimens to known (legitimate) breeding programmes to ensure genetic diversity of these captive populations. A spin-off of this programme may be a reduced demand for wild-caught specimens.

The latest addition to our programme is a capture-mark-release programme on the Green Turtles which aggregate at the mouth of the Kunene River. The disjunct population of Nile Soft-Shelled Turtles which also occur there, are also opportunistically marked.

Lastly, another aspect of the conservation side of Namibian herpetology deals with the illegal trade in local reptiles. This is a South African-based market, centering around Johannesburg and Cape Town. Animals are illegally collected and exported from Namibia, illegally imported into the Republic of South Africa, and supplied to local and overseas collectors, foreign markets and museums (as preserved specimens). To our knowledge, this activity has not yet caused any serious conservation problems. The majority of Namibian species of conservation concern are protected by their habitat and habits. The habitats of some rupicolous species are, however, limited in extent and may be destroyed by unscrupulous collectors. Stricter border control, since Namibian independence, and increased fines (up to R20 000 for some reptile species) may discourage some collectors.

Submitted by: Mike Griffin, Biologist - Small Terrestrial Animals, Ministry of Wildlife, Conservation and Tourism, P.O. Box 13306, Windhoek, Namibia, 9000.

TRANSVAAL DIVISION OF NATURE CONSERVATION

A final report on the project "The distribution and status of reptiles and amphibians in the Transvaal" was submitted during 1990. Altogether, 212 reptile and 53 amphibian taxa were recorded from the province, of which four were described during the study. Another 15 incorporated in the species accounts remain to be formally described, while new taxa exist in the complex genera *Lygodactylus*, *Bradypodion* and *Pedioplanis*.

The report also proposes several nomenclatural changes, including the elevation to species status of *Afroedura multiporis* with *A. m. haackei* closely related. The *Pachydactylus capensis* complex has been split into three species, including *P. c. capensis*, *P. affinis* and *P. vansonii*. However, additional work needs to be conducted on these sibling species as the formulation of a workable key is of prime concern and needs to be addressed further.

Although there is some difference of opinion as to the validity of *Agama aculeata armata*, in the Transvaal, this taxon as described by Peters (1882) occurs only to the north of the Soutpansberg and is recognisable by the total reticulate nature of the gular. Its apparent geographical isolation in the Transvaal leads me to accept it as a valid taxon. *Nucras taenioata ornata* has been split into *N. holubi* which is characterised by a series of alternating light and dark dorsal stripes while *N. ornata* is a large eastern species which may have a vertebral stripe. *Cordylus vandami* has been re-elevated to species status, while changes to the genus *Platysaurus* have already been published elsewhere (*J. Herp. Ass. Afr.* 36:51-63).

The report incorporates many range extensions, a few of which have been published in the *Journal of the Herpetological Association of Africa* 34:50 and summarizes much existing biological knowledge, including observations made during the survey.

The Transvaal roughly incorporates 50% of the species and subspecies of herpetofauna found in South Africa. Of the 265 taxa found in the province, 225 are to be found in one or more conservation area. This means that 40 species have not been recorded from any formal conservation area to date. However, as surveys of such areas are still incomplete, it is possible that some of these species will indeed be found in reserves. During this survey, six species which had previously been recorded from the province were not found. These include an endemic species, *Tetradactylus eastwoodae* from the Woodbush area, a species which may be extinct as a result of afforestation. These species will now be the target of more in-depth surveys, hopefully with positive results. Such surveys will be initiated during the coming summer months.

At this stage, research is focussed on sorting out the genus *Lygodactylus*, which will hopefully be completed soon. The publication of my final report will also receive high priority in order to make it available to interest parties, a feature which I am unable to do at present owing to the voluminous document.

Submitted by: N.H.G. Jacobsen, Directorate: Nature and Environmental Conservation, P. Bag X209, Pretoria, 0001.

SHORT COMMUNICATIONS

NOTES ON THE CAPTURE AND HANDLING OF VENOMOUS SNAKES AND THE ABUSE OF TONGS

G.S.A. Rasmussen

Chipangali Wildlife Trust, P.O.Box 1057, Bulawayo, Zimbabwe

Having watched over the years the emergence of tongs into the field of herpetology, it has come to my notice with some distress that they seem not only to be regarded as an aid to handling venomous snakes, but also as a 'cure all' to avoid getting bitten. Often I might add, at the expense of the very snakes we are aiming to protect. Tongs appear to have emerged in the United States of America after the idea of venomoids was rejected (venomoids are snakes whose venom glands were surgically removed) and have become regarded as the next best thing.

All good collectors are now aware that minimal stress during capture and in captivity results in healthier snakes far more likely to breed. Tongs, I thus personally fear, can be totally counter-productive for the following reasons:

- i) Even in the most careful hands there is little possibility of having much sense of feel, and even with the best will in the world, if a snake such as a large mamba starts struggling, one's own instinct will tend to tighten the grip to a point that could be detrimental to the snake concerned.
- ii) They are used as a short-cut to handling venomous snakes by personnel neither ready nor responsible enough to be capturing them (it is not as though we are short of harmless species!).
- iii) The injuries they do cause are generally serious, often long-term, lingering and in many cases fatal.

Just recently I had the misfortune to witness and receive first-hand, reliable accounts of snakes damaged by tongs. This sickened me so much that I was prompted to submit this report, hopefully to the benefit of all - in particular the snakes.

Case 1 Gaboon Viper male sent out on breeding loan was returned listless and died some months later. An X-ray and post-mortem showed several cracked ribs and internal bleeding. It was subsequently found that tongs were used at the establishment without any attendant awareness as to their dangers.

Case 2 A Green Mamba in a captive collection suffered paralysis for a section of apr. 30 cm due to one of the back vertebrae being misaligned and trapping a nerve.

Furthermore, it is a well-known fact that a large percentage of snakes captured by Ionides were damaged through the use of tongs, and subsequently died.

Personally, I do not use tongs to handle snakes in any circumstances and know a lot of collectors who manage their collections quite well without them. This I thus feel indicates that in any collection their use should certainly be minimal rather than *ad libitum* (if at all!).

The piece of equipment I have found totally satisfactory for nearly all applications is nothing other than a hook/press stick combined. A few sizes are generally desirable to be compatible with the different cage sizes and obviously the snakes themselves. For field work I generally prefer the larger size which is more of an all-purpose tool, and is more suited to the larger species.

In the case of captive handling, I recommend the following procedure, and suggest that collectors bear in mind that snakes do not thrive on excessive handling, and this should be kept to an absolute minimum. When simply needing snakes out of the way for cleaning purposes, possibly the easiest is the use of a catch-box and slide which evokes no stress on behalf of the snake. For mambas and cobras, which are more often than not particularly keen to use such a facility, I feel this system cannot be bettered.

Large, heavy-bodied snakes such as Puffadders and Gaboon Vipers on the other hand, often cannot be bothered to move and the easiest and gentlest method is to simply use a pair of hook sticks to support the body and lift them into a nearby tank.

Large cobras and Boomslangs are often moved simply by supporting the body with a hookstick and holding the tail. It is felt salient to point out that the internal angle of the crook should be correct to both minimize the movement of the snake in question and at the same time support it. With smaller snakes it is simply easier to hook them out. I strongly recommend that lethal snakes are well out of the way when attending to cages for cleaning or to adjust cage furniture. It is all too common to see handlers trying to fish faeces out from some awkward spot in a cage in a hurried manner with half an eye fixed on the occupant. Generally the end result is half a job done. Thorough and proper cleaning cannot truthfully be carried out with poisonous occupants inside.

Obviously from time to time it will be both expedient and necessary to handle one's charges, and here my standard press stick with a 25 cm splay on the head serves as an excellent tool. The wide splay facilitates speedier pinning down, particularly when catching snakes for the first time. In the case of mambas and cobras it also serves as an excellent device for slowing them down in the field. Under controlled conditions it is often a good idea to place a sack down on which to pin the head. This lessens the risk of canker and reduces the likelihood of damage. Well-managed and properly handled snakes are without doubt far less aggressive.

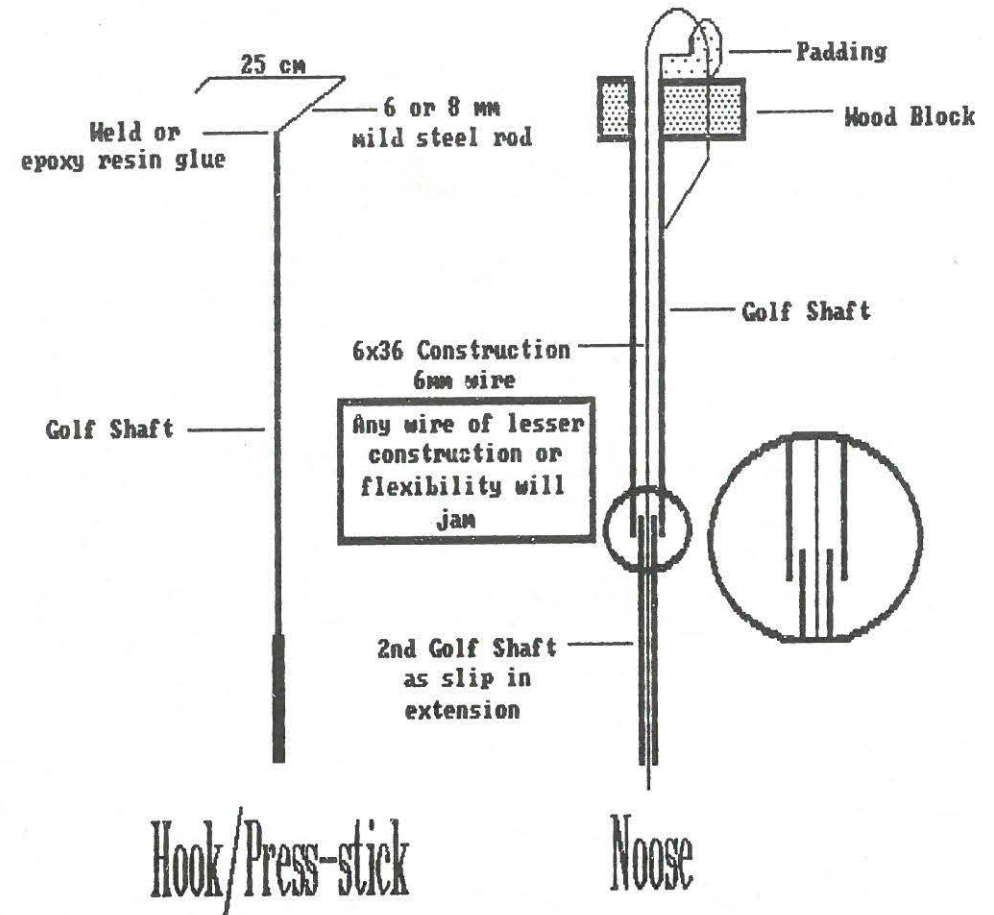
With regard to field capture, I still maintain the use of the press-stick so described and do not recommend the use of make-shift sticks and bags, for they only increase the risk of damage to the snake and of the catcher getting bitten. If suitable equipment is not to

hand and capture cannot be executed without risk to either snake or handler, exercise restraint and let it be the snake's lucky day for a change.

As far as the capture of Boomsnags, large mambas and cobras are concerned, it is the only case I would sanction the use of a mechanical tool for initial capture. Solely for the reason that the former are generally too long to be safely held by the tail away from the body, and the latter are inaccessible on the terminal twigs of trees. In such cases I definitely prefer a noose in preference to tongs. My reasoning for this is that a splayed noose moulds to the body of the snake rather than crushing it. Furthermore it can be used to simply bring the first third of the body into the open where the head can be pinned down in the usual manner. I do not attempt to noose the head due to the complicated structure of bones in that region, some of which are very fragile. Ideally, 30-40 cm away from the head is best. A noose also has the major advantage of being easily controlled. Once it is at minimum pressure, the line can be folded back and there is no risk of 'heat of the moment' accidental tightening. I must stress however, that I only use a noose when it is definitely warranted and not as routine. It is felt salient to point out at this stage that on one's return with specimens from the field, it is always advisable to ensure that their mouths are clean. Often grit or dirt can enter the mouth during capture, thus causing the risk of canker or mouth rot.

With respect to bagging, the use of a bag inverted and puppet fashion is often the safest. Do however ensure that the bag is securely tied before letting go! Furthermore, check all bags thoroughly before use. Many accidents have happened as a result of negligence in this department. When using sacks however, as any form of feeling is limited, the safest way is to drop/toss the head in with a flick and have the sack closed simultaneously with a noose. The reason for using a noose is that due to the thickness of the cloth, it is not easy to secure the neck properly prior to tying. Highly venomous snakes should be at the very least double-bagged, but ideally should be placed in a bag within a box. Many handlers, and even worse, unsuspecting personnel, have been bitten as a direct result of simply failing to follow the latter procedure. Analysis of the prelude to case histories often serves to highlight areas where more care can be taken and hopefully save oneself from the same trauma.

On a final note, beware of 'flying puffadders' and relegate your tongs to what is perhaps their best use: 'feeding mice to mambas'.



THE "ENDANGERED" ONES

Ernst Baard

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Most people who are up to date with reptile and amphibian conservation in southern Africa will know that there are four amphibians, one chameleon and one tortoise which are at present considered "Endangered" species (Branch, 1988). These six species, namely the Cape Platanna (*Xenopus gilli*), the Table Mountain Ghost Frog (*Heleophryne rosei*), Hewitt's Ghost Frog (*Heleophryne hewitti*), the Micro Frog (*Microbatrachella capensis*), Smith's Dwarf Chameleon (*Bradypodion taeniabronchum*) and the Geometric Tortoise (*Psammobates geometricus*) all have two things in common. Firstly, all of them are endemic to the fynbos biome - the floral "kingdom" of the south-western and southern Cape, and secondly, man has played a major role in the deterioration and destruction of large parts of their natural habitats.

The Cape Platanna and Micro Frog, largely sympatric at most localities where they are to be found, have been subjected to severe pressure throughout their distribution ranges. The natural waterbodies and surrounding habitat in which these frogs previously occurred have been converted to either horticultural land (e.g. the Cape Flats and greater Cape Town metropolitan area) or new residential areas, or have been infested by almost impenetrable thickets of Australian acacias, port jackson (*Acacia saligna*) and rooikrans (*Acacia cyclops*) (Baard, 1989). Presently these two species are known from only a handful of localities in the south-western Cape (Picker & De Villiers, 1988; De Villiers, 1988).

The Cape Platanna further suffers from cross-breeding with its cousin, the Common Platanna (*Xenopus laevis*), and concern among interested herpetologists has led to the founding of the Cape Platanna Conservation Committee (CPCC). The CPCC has as one of its main objectives the conservation of genetically pure *X. gilli* breeding stock in the wild.

The Table Mountain Ghost Frog and Hewitt's Ghost Frog are the two South African frogs with possibly the smallest distribution ranges. *H. rosei* is known from only nine localities on the eastern slopes of the mountain (Boycott, 1988a). Not only does this have severe implications for the conservation of this species (Boycott & De Villiers, 1986), but man-made constructions (reservoirs, weirs, etc.) and unwise forestry management may exterminate it on the eastern side of Table Mountain.

Hewitt's Ghost Frog has not done much better. Known from only four streams in the Loerie and Otterford Forest Reserves in the Elandsberg Mountains of the eastern Cape, this species is threatened by habitat loss due to the over-utilization of its habitat for forestry practices (Boycott, 1988b). Forest fires also pose a threat.

Smith's Dwarf Chameleon has a very restricted distribution range and is currently known from a single population, occupying an area of approximately 20 km² in the Van Stadensberg, Port Elizabeth district (Branch, 1988). These small chameleons inhabit mountain fynbos and retreat into dead flower heads of protea stands in windy and cold weather. Pine plantations and the encroachment of alien vegetation threaten the survival of the species (Branch, 1988).

The distribution range of the Geometric Tortoise in the south-western Cape is characterized by severely fragmented and isolated remnants of renosterveld vegetation usually found between vast stretches of wheatlands and vineyards. The species is confined to this vegetation type in the Cape lowlands and the Worcester and Ceres valleys. The Geometric Tortoise is severely threatened by habitat destruction, alien vegetation infestation, too frequent and uncontrolled fires, and possibly pesticide drift from adjacent cultivated lands (Baard, 1988; Baard, 1989). Its ultimate survival depends on the acquisition of more land for habitat protection, correct management of currently reserved areas and the attitudes of landowners towards its plight.

Mitigating steps to alleviate pressure on these species have already been taken and the Chief Directorate: Nature and Environmental Conservation, Cape Province, has played a big part in securing habitat for some of them. It does, however, become more and more difficult to secure habitat, due to the ever-rising cost of purchasing land for conservation. Populations of all six species are presently protected in either private or provincial nature reserves, forest reserves, local authority reserves or other protected areas such as the Table Mountain Nature Area.

In reality, however, the conservation status of the above-mentioned reptiles and amphibians is critical. It may not be inconceivable to predict that we may lose at least one of these six species before the end of this century. Although the mere thought of this is saddening, we can in the meantime create an awareness of these special animals, pass our concern about them on to others and above all, teach our children to appreciate nature as we are undeniably part of it.

References

- Baard, E.H.W. 1988. *Psammobates geometricus*: species account. pp. 39-42. In: *South African Red Data Book - Reptiles and Amphibians*. W.R. Branch (ed.), S. Afr. Nat. Sci. Prog. Rpt. 151.
- Baard, E.H.W. 1989. The status of some rare and endangered endemic reptiles and amphibians of the Southwestern Cape Province, South Africa. *Biol. Conserv.* 49:161-168.
- Boycott, R.C. 1988a. *Heleophryne rosei*: species account. pp. 36-38. In: *South African Red Data Book - Reptiles and Amphibians*. W.R. Branch (ed.). S. Afr. Nat. Sci. Prog. Rpt. 151.
- Boycott, R.C. 1988b. *Heleophryne hewitti*: species account. pp. 33-35. In: *South African Red Data Book - Reptiles and Amphibians*. W.R. Branch (ed.), S. Afr. Nat. Sci. Prog. Rpt. 151.

- Boycott, R.C. & De Villiers, A.L. 1986. The status of *Heleophryne rosei* (Anura: Leptodactylidae) on Table Mountain and recommendations for its conservation. *S. Afr. J. Wildl. Res.* 16(4):129-134.
- Branch, W.R. (Ed.) 1988. *South African Red Data Book - Reptiles and Amphibians*. S. Afr. Nat. Sci. Prog. Rpt. 151, iv, 242pp.
- De Villiers, A.L. 1988. *Microbatrachella capensis*: species account. pp. 29-32. In: *South African Red Data Book - Reptiles and Amphibians*. W.R. Branch (ed.), S. Afr. Nat. Sci. Prog. Rpt. 151.
- Picker, M.D. & De Villiers, A.L. 1988. *Xenopus gilli*: species account. pp. 25-28. In: *South African Red Data Book - Reptiles and Amphibians*. W.R. Branch (ed.), S. Afr. Nat. Sci. Prog. Rpt. 151.



Frances loved her little pets, and dressed them differently every day.

BIFID, TRIFID AND BRANCHED TAILS IN LIZARDS

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It is a well-known fact that many lizard species are able to shed their tails when attacked by a predator, and subsequently grow a new tail similar in shape and size to the original (Arnold, 1988). However, if the tail is broken on one side only but not shed, a new growth may occur on the ruptured side resulting in a forked or bifurcated tail (Das, 1932; Rose, 1950; Jacobsen, 1985). The tail can also be injured on opposite sides or at various points and result in a trifurcated or "branched" appearance (Das, 1932).

From laboratory experiments on *Gecko verticillatus* Laurenti, Das (1932) found that when only the muscular coating of original and regenerated tails was severed, a lateral outgrowth or accessory tail lacking a supporting skeletal structure was usually produced. He regarded such outgrowths as merely elongated fleshy lobes. However, when the wound was deep enough to affect the vertebral column of the original tail or central cartilaginous tube of the regenerated tail, an accessory cartilaginous tube developed from the point of injury and extended as a supporting structure inside the accessory regenerated tail (Das, 1932). The above findings are contrary to Rose's (1950) statement that "any mutilation of the regrown portion (of the tail) will be followed by healing of the wound only".

Bifid and trifid tails have been recorded in a large number of lizard species representing many families (for references see Sood, 1939). More recent reports include those for Gekkonidae (Haacke, 1975, 1976 a-b; Bates, 1989), Scincidae (Broadley, 1977: 65), Gerrhosauridae (Jacobsen, 1985:61) and Agamidae (Baig, 1988).

Das (1932) stated that "the production of double or triple tails in lizards is by no means an uncommon phenomenon under natural conditions", while FitzSimons (1943) and Rose (1950) state that bifurcation or even trifurcation of the regrown portion of the tails of geckos is not infrequent. However, Bates (1989: 231) found only three bifurcate and one trifurcate tails in a sample of 170 regenerate-tailed *Pachydactylus c. capensis* from the Orange Free State, while all 40 such specimens from another sample (Pretoria area) had normal regenerates.

To determine the frequency in occurrence of bifid and trifid tails in scincid lizards, specimens of 7 species of *Mabuya* in the wet collection of the National Museum were examined (Table 1). Broken tails showing no signs of regeneration were not included in sample sizes. Four specimens of the gecko *P.c. capensis* with bifid (3) and trifid (1) tails (see Bates 1989), housed at the National Museum, were also examined. The above specimens were X-rayed to determine the skeletal structure of the tail.

The tail of a *Mabuya occidentalis* (National Museum, Bloemfontein catalogue number: NMB R5699) from Montrose farm, Kalahari Gemsbok National Park, had a branched appearance (Fig. 1). The skink had a snout-vent length of 83,0 mm, a greatest tail

length of 110,5 mm and apr. 50,4 mm of the original tail still remained. Examination of radiographs showed that cartilaginous rods were present in all branches of the regenerated tail (see *a* and *b* in Fig. 1).

Two specimens of *M. striata punctatissima* had bifurcate tails. Although unclear, radiographs of the tail of NMB R1312 suggest that the tail had regenerated from just anterior to the branching, and that both branches contained a cartilaginous rod. The tail of NMB R4334 was similar, but one branch had no distinct cartilaginous rod and would appear to represent a fleshy lobe (cf. Das, 1932). The tail of one *M. s. sulcata* was distinctly bifurcated (NMB R6310).

The tail of one *Pachydactylus c. capensis* (NMB R1599) was trifurcate. The regenerated portion of the tail represented about 60% of the total tail length, and there were two accessory regenerated tails without cartilaginous rods ("fleshy lobes") on opposite sides near the terminal end of the tail (Fig. 2).

Three other *P.c. capensis* had tails bifurcated near their terminal end. The tail of NMB R4183, measuring apr. 35,4 mm, was regenerated from near the base and has an accessory regenerated tail measuring 2,4 mm at its terminal end which grew back towards the body at an angle of apr. 45° to the tail. Both the central regenerated tail and the branch contained a cartilaginous rod. The tail of NMB R4033 is similar, but the tail branches grow away from the tail. Specimen NMB R2106 was not X-rayed, but the regenerated tail has an indication of a bifurcated terminal tail tip.

Although bifid and trifid tails are produced under natural conditions, following injuries caused accidentally or by predatory attacks (Das, 1932), their occurrence in *Mabuya* and *Pachydactylus c. capensis* (Bates, 1989) is apparently infrequent (Table 1).

It would be interesting to contemplate the affect a bifid or trifid tail has on a predator, bearing in mind that to be effective as a deterrent, the tail of a lizard must visually distract its predator by its size and movement. A branched tail is probably more conspicuous to potential predators than an original or "normal" regenerate, but the mobility and running speed of the lizard might well be reduced due to the tail being unbalanced and possibly getting stuck between rocks and/or vegetation. It should be remembered, however, that many lizards experience tail loss more than once during a lifetime, and a "branched" tail may be only a temporary condition.

Table 1: Number of bifid and branched tails in samples of ten species and sub-species of *Mabuya*.

Species	No. of bifid* and branched** tails	Sample size
<i>M. homalocephala smithii</i>	0	2
<i>M. capensis</i>	0	252
<i>M. occidentalis</i>	1**	11
<i>M. varia</i>	0	92
<i>M. s. sulcata</i>	1*	86
<i>M. v. variegata</i>	0	8
<i>M. v. punctulata</i>	0	33
<i>M. s. striata</i>	0	5
<i>M. s. sparsa</i>	0	6
<i>M. s. punctatissima</i>	2*	215

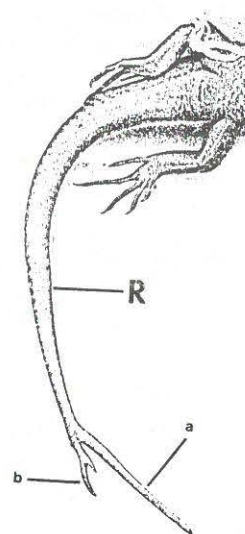


Figure 1: *Mabuya occidentalis* (NMB R5699) with "branched" tail. The origin of the regenerated tail is indicated by an R, whereas the accessory branches are indicated by a and b.



Figure 2: Trifurcate tail of a *Pachydactylus c. capensis* (NMB R1599). The accessory tails (a and b) represent "fleshy lobes".

Acknowledgements

I would like to thank Mr. Gerald Haagner for donating a branch-tailed *Mabuya occidentalis* to the National Museum.

References

- Arnold, E.N. 1988. Caudal autotomy as a defense, pp. 235-273. In: *Biology of the Reptilia* 16, Ecology B. Gans & Huey (Eds.). New York: Alan R. Liss, Inc.
- Bates, M.F. 1989. Tail-break frequency, tail size and the extent of caudal autotomy in the Cape thick-toed gecko, *Pachydactylus capensis capensis* (Sauria: Gekkonidae). *Navors. nas. Mus., Bloemfontein* 6(7): 223-242.
- Baig, K.J. 1988. An unusual tail regeneration in *Agama*. *Pakistan J. Sci. Ind. Res.* 31(10): 731-732.
- Broadley, D.G. 1977. A review of the *Mabuya striata* complex in South-East Africa (Sauria: Scincidae). *Occ. Pap. natn. Mus. Rhod.* 6(2): 45-79.
- Das, G.M. 1932. Observations on the trifid tails in two specimens of *Hemidactylus flaviviridis*, Rüppel, with a note on the artificial regeneration of double and triple tails of the "Tokhok" lizard, *Gecko verticillatus*, Laurenti. *J. Bombay Nat. Hist. Soc.* 35: 656-662.
- FitzSimons, V.F.M. 1943. The Lizards of South Africa. *Transvaal Museum Mem.* 1: 1-528.
- Haacke, W.D. 1975. The burrowing geckos of Southern Africa, 1 (Reptilia: Gekkonidae). *Ann. Transv. Mus.* 29: 197-243.
- Haacke, W.D. 1976a. The burrowing geckos of Southern Africa, 2 (Reptilia: Gekkonidae). *Ann. Transv. Mus.* 30: 13-28.
- Haacke, W.D. 1976b. The burrowing geckos of Southern Africa, 3 (Reptilia: Gekkonidae). *Ann. Transv. Mus.* 30: 29-39.
- Jacobsen, N.H.G. 1985. *Ons reptiele*. Cum-boeke. Roodepoort.
- Rose, W. 1950. *The Reptiles and Amphibians of Southern Africa*. Maskew Miller, Cape Town.
- Sood, M.S. 1939. A peculiar case of caudal abnormality in *Hemidactylus flaviviridis*. Rüppel. *Proc. Ind. Acad. Sci.* B 9: 316-322.

TO BOAST OR NOT TO BOAST?

(with apologies to William Shakespeare)

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The following quote from the book "GOGGA BROWN The life-story of Alfred Brown, South Africa's Hermit-Naturalist" by M.R. Drennan (undated), Maskew Miller, Cape Town, is taken from a herpetological novel by Angus Bellairs. This novel was published recently by the Durrell Institute of Conservation and Ecology, University of Kent at Canterbury, UK, on the occasion of the First World Congress of Herpetology (September 1989). The book review by Sherman A. Minton, Indiana University School of Medicine, Indianapolis, USA [*Herp Review* 20(4), 1989: 100] hails this as an entertaining story with a herpetological theme and a must for any herpetologist.

At the first attempt, reading the quote from "GOGGA BROWN" makes one feel uneasy about this boastful passage, but in retrospect one realizes that it is spiced with all the obvious characteristics of many a herpetologist who has suffered long, hot hours under the glaring sun at temperatures well into the forties, waiting or searching for that elusive lizard or snake (after missing it about an hour ago!). Well, eat your hearts out!

"Yet the real truth is that this low Order [the Reptiles] of the Animal Kingdom has a strange fascination for a rare intellect here and there. Moreover, it is usually to an exalted type of mind that these despised creatures make their appeal, for it is only a character combining nobility and humility of soul that is prepared to understand and to learn from the meanest things in Creation. In short it would appear that, whilst any one of us might become a naturalist in the realm of flowers or birds or even insects, it is only he who is ordained by God himself who is qualified to minister in that rejected Kingdom of creeping things."

REPRINTS

Article reprinted with permission from *Mirafra* 7(2):49 [1990].

RINKHALS AND BOKMAKIERIE ENCOUNTER

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I was interested to read of the encounter with a Rinkhals by Redknobbed Coots 228 *Fulica cristata* (Vickery 1989, *Mirafra* 6(4): 103). The other morning while having breakfast my wife and I noticed a Bokmakierie 746 *Telophorus zeylonus* busy with something under the grape-vine. When I fetched my binoculars I was surprised to see that it was a Rinkhals *Hemachatus haemachatus* of about 10 inches long. He was trying to wedge it in a fork of the vine and after a number of attempts he succeeded and started tearing it to bits and eating it. While he was busy a Whitebrowed Sparrowweaver 799 *Plocepasser mahali* wanted to join in the feast but the Bokmakierie grabbed the tail section of the snake and ran off with it. The head and about an inch and a half of the snake remained behind and I was able to see that it was a Rinkhals. I would very much have liked to see how he managed to catch and kill the rinkhals.

I see in *Roberts Birds of Southern Africa* that snakes are listed on the Bokmakierie's menu. It is the first time I have seen one eating a snake.

Article reprinted with permission from *Witwatersrand Bird Club News* no. 149:19, June 1990.

DIET

When we were at Sun City last year we spent quite a long time watching a Lilacbreasted Roller with what appeared to be a long, thin snake. The bird kept on working the snake back and forth through his beak, first having most of the snake hanging out on one side, then rapidly working it back so that most of it was hanging out on the other side. It seemed as though the bird was "softening" the snake, unless it was his method of killing it, but it didn't appear to be writhing. When the bird was satisfied it started at one end of the snake and gradually gulped it down. We wondered what the reason really was for the rapid working back and forth through the beak.

Bill and Elaine Mortimer

It seems most likely that the roller was getting the snake into a more digestible state. If any readers have any other ideas I would be pleased to hear them - ed. WBCN.

FROM THE PRESS

The Citizen, 15 June 1990.

BLACK MAMBA FOUND IN JHB MARKET

A Black Mamba was delivered to the Transvaal Snake Park in Halfway House yesterday after two security guards found the snake slithering around Johannesburg's City Deep fruit and vegetable market.

The curator of the Transvaal Snake Park, Mr Scott Gillespie said black mambas were not indigenous to the area and he believed the snake had probably been lying in a consignment of bananas when the fruit was brought to the market from the Northern Transvaal.

The large, grey, highly venomous snake was first spotted on Sunday by a farmer who had taken a consignment of beans to the market.

However, when he reported the matter to the Transvaal Snake Park he omitted to mention which market and as a result the incident could not be investigated further.

When the snake reared its head again yesterday, two quick thinking security guards caught it with a noose, bundled it into a 44 litre drum and, not sure whether it was dangerous or not, carted it off to the snake park.

When officials there gingerly opened the container they were confronted by a "fairly indignant", two-and-a-half metre, 10 to 15 year-old male black mamba, Mr Gillespie said.

He said the snake had since been quarantined in a terrarium until it could be safely returned to a suitable place in the wild.

Submitted by: Mrs Rose Bates, 548 Boeing Street, Elardus Park, Pretoria, 0181.

Pretoria News, 9 Oct 1990

ZOO A 1,2 m LEGUAAN RICHER

by Eric Janssen, Staff Reporter

Some people despise insects in their garden. Others hate snakes. But just about all think twice when they notice a 1,2 m leguaan in their yard.

Although Brett Gow and his wife thought nothing of a "mating call" and odd "tapping noises" outside their Flowers Street home, Capital Park, domestic Betty Sibanyoni proved them wrong.

A frantic call to Mr Gow, mentioning something "looking like a snake", convinced him to phone the zoo.

Mr Gow and a friend caught the leguaan and then Rina van Vuuren of the zoo grabbed the hissing 6 kg monster and carted it off.

Submitted by: Mrs Rose Bates, 548 Boeing Street, Elardus Park, Pretoria, 0181.

TURTLES RETURN TO 'BIRTH BEACH' TO LAY THEIR EGGS

The following is an interesting article which appeared in *New Scientist*, 23 June 1990, No. 1722:

"Female Green Turtles (*Chelonia mydas*) are remarkably faithful creatures, travelling thousands of kilometres from feeding grounds to return to the same beach each year to lay their eggs. But zoologists have long debated how the animals first decide where to nest. Do young females return to their natal beaches, or follow experienced females from their feeding grounds? Genetic analysis of several populations of marine turtles in the Caribbean Sea and the Atlantic Ocean suggests that turtles favour their place of birth (*Science*, vol. 248, p. 724).

Anne Meyland of the American Museum of Natural History in New York and her colleagues at the University of Georgia in Athens analysed the mitochondrial DNA of turtles on four different nesting beaches, or rookeries. This DNA is passed from mother to offspring in the cytoplasm of the egg. So if female turtles return faithfully to their natal beaches, turtles in different colonies should have evolved distinctive mitochondrial DNA. But if young females follow experienced breeders, maternal lineages would tend to be mixed together in any one colony.

The genetic analyses favour the natal homing theory. Three of the four rookeries studied had distinct mitochondrial DNA.

The fidelity to birthplace must occasionally break down, because green turtles have colonised oceanic islands and mainland coasts throughout the tropics. But the finding that most rookeries are genetically distinct has important implications for conservation. Protecting one colony will probably do little to safeguard others, the researchers conclude. Conservationists must intervene anew to save each one."

Submitted by: Ernst Baard, Jonkershoek Nature Conservation Station, P. Bag 5014, Stellenbosch, 7600.

Cape Times, 1 August 1990.

ADDER LITTLE SPICE TO YOUR DIET

by Dale Granger

Puffadder pie is the latest culinary offering to emerge from the ovens of a Hout Bay baker who tickles his clients' tastebuds with crocodile pie, elephant pie, ostrich pie, porcupine pie and shark pie.

According to Austrian chef Mr Robert Bruckner, his puffadder pie, which he started making only recently, is a world first.

"It's delicious and there's nothing wrong with it," he said. "People eat snails and frogs, and boy scouts are taught to survive on snake food.

"At the moment the snakes are hibernating and my clients have to be patient. People phone me saying they would like to try it, and I tell them to leave their number and I phone them back when one comes in," he said.

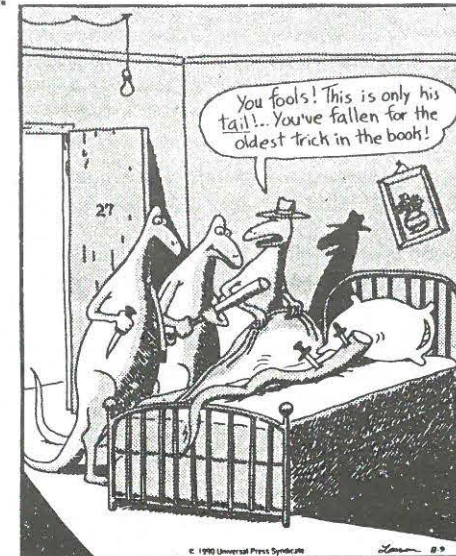
One puffadder makes about 15 pies, he said.

Mr Bruckner added that python pie would be "ideal, but they are a protected species".

He recommends that snakes be bred for food and their skins.

In future Mr Bruckner is hoping to whet appetites with baboon pie.

Submitted by: Ernst Baard, Jonkershoek Nature Conservation Station, P. Bag 5014, Stellenbosch, 7600.



Lizard thugs

Sunday Star Review, 26 August 1990, page 4

A HUNDRED SPECIES ARE DISAPPEARING A DAY

Wildlife: James Clarke

Twenty years ago it was thought there were about three million kinds of plants and animals on Earth. Ten years ago they were talking of five million.

Today it is thought there may be 30 million, of which 20 million are in the Amazon Forest alone. But only 1,4 million have been properly described by scientists.

Brian Huntley, editor of an important new book, *Biotic Diversity in Southern Africa*, edited by B J Huntley (Oxford University Press at R45), says the numbers may not be important: what is important is how to slow the rate of extinction going on around us.

Worldwide, possibly as many as 100 species of creatures and plants are disappearing - a day. This loss undermines the very foundation of ecological stability - the variety factor.

The greater the variety of living things, the greater the stability of an ecosystem. The Amazon forest is one of the world's most stable ecosystems because of this.

Reading the umpteen collected papers in this 400-page book, it becomes clear that the present rate of loss is unsustainable. The Earth is being mindlessly and irresponsibly altered.

Huntley, who expresses something akin to alarm about South Africa's own situation, says that not since the great asteroid shower of 65 million years ago, which may have wiped out the dinosaurs and the Age of Reptiles, has Earth experienced such an accelerated rate of extinctions.

One of Huntley's authors, Ian Macdonald of UCT, sees Southern Africa as one of the most man-altered regions on earth.

MacDonald gives a useful overview of the impact of agriculture, and of forestry. He includes such detail as the death of large trees in South Africa's most protected area - Kruger Park - about 30 years ago.

It is true that elephants were largely to blame, but the elephants could not have demolished all those big, centuries-old leadwoods which, to this day, stand like grotesque monuments clawing at the sky. What killed them all so suddenly?

The only plausible explanation is that it was because boreholes, which were being sunk for new water holes at the time, lowered the water table.

Roy Siegfried's paper reveals some new, or at least refined statistics: there are 20 300 vascular plant species in South Africa - a surprising number for so small a region.

More interestingly "an extraordinarily high proportion of southern Africa's terrestrial vertebrate fauna, and possibly 74 percent of its vascular plant species, are represented by breeding populations in the region's nature reserves." It is remarkable, he says, because only six percent of the region is under reserves.

The book is a mixture of good and bad news and gives an overall impression of a country which is stumbling into the future and whose people do not really appreciate that survival lies in the soil, nowhere else.

Huntley, formerly of the CSIR and now head of Kirstenbosch, has done a great job pulling together a coherent set of thought-provoking papers written by top scientists: Mike Mentis on the economics of conservation; Tony Hall on the status of the fynbos region; Tony Farrer on the role of the CSIR's Red Data Book series; Jay O'Keefe on rivers; Alan Heydorn on marine life; Roelf Botha on national policy and dozens more.

One certainly gets one's money's worth because this all adds up to a valuable reference work.

Many of the papers are original and some are "recycled" but have been updated.

It is a pity that some of the papers are not addressed to the man-in-the-street and to politicians; a lot of jargon has crept in and a lot of pompous scientific faddishness.

Even Huntley himself (he is normally very aware of the need to be understood at all times by the widest possible audience) lapses with: "a global total of the general order of 10 to the power of 7" when what he means is that "there's about 100 million worldwide".

The book is well indexed and the bibliographies are valuable. A library without this book would not be worth tuppence.

Submitted by: Mrs Rose Bates, 548 Boeing Street, Elardus Park, Pretoria, 0181.

IGUANAS - REALLY EXOTIC

The following is an interesting article which appeared in *Effective Farming*, October 1990:

"Small farmers in Central America are raising green iguanas in the same manner in which they grow free range chickens. In that part of the world iguanas have been eaten both as a delicacy and as a staple food for over 7 000 years. They are fairly adaptable creatures, being farmed from Mexico to Brazil.

Green iguanas, when full grown, are about two metres long and weigh six kilograms. They are cold blooded animals and therefore need sunshine to maintain their metabolism. Their food requirements are cheap and simple, including leaves, flowers and fruits, which can be second grade, and a protein supplement. In Central America they are kept in forests with widely spaced trees, and produce about 300 kg of meat a year per hectare.

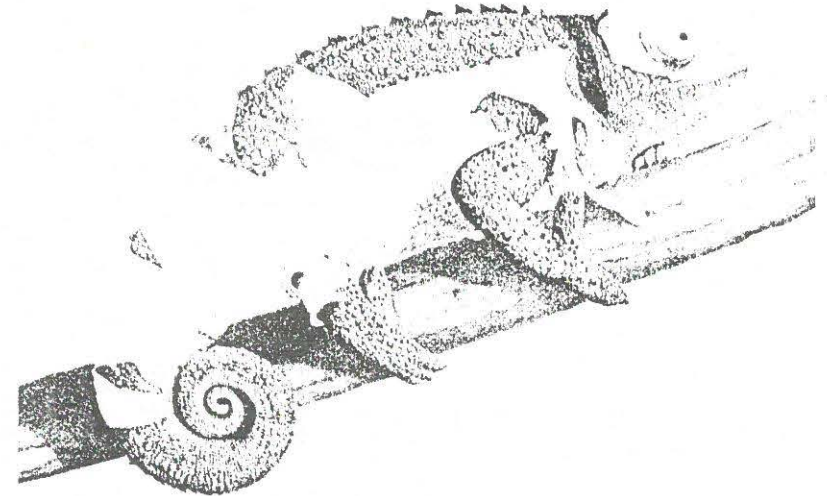
Female iguanas are persuaded to lay their eggs in artificial egg-laying sites instead of in deep nests. The eggs are incubated in small cylinders made of screening that lie on top of the ground. As they hatch, the young iguanas, which are about five centimetres long, are protected by palm fronds or similar vegetation. Nearly 100 per cent survive in captivity, whereas in the natural state 95 per cent fall prey to predators.

The animals become sexually mature in two years, far more rapidly than in the wild, and also grow twice as quickly. Iguanas are being grown commercially in Panama, Costa Rica, Honduras and Guatemala already, and the programme is planned to spread shortly to El Salvador, Venezuela, Colombia and Nicaragua."

Submitted by: Barry Porter, Game Valley Estates, P.O. Box 70, Richmond, 3780.

TOPIC TODAY

Biology — 6



A reptile's outer skin is clear and has no colour, and the skin is shed several times a year. When a chameleon is ready to shed its skin it looks white and the skin sloughs (pronounced sluffs) off in pieces. Once the old skin is shed the new colours are brighter. Picture: The Life of Reptiles and Amphibians (Macdonald Educational, Introduction to Nature).

Little lions of the reptile world

by PENNY HOWCROFT

Chameleons (pronounced kuh-mee'-lee-yuns) are small dragon-like lizards which make up the family Chamaeleonidae. Though most live in trees and bushes, some are ground-dwellers.

They range from Africa and the Malagasy Republic to southern Spain, India and Sri Lanka.

Colour changes

The chameleon is greatly feared by Africans, and it figures in many African legends as a creature which brings bad luck. It is easy to believe that chameleons possess some kind of magical power for this fearsome-looking little dragon has the astonishing ability of being able to change colour. One minute it may be green, then its colour may change to yellowish-green, brownish, brownish-black, to blotched.

These colour changes occur, however, in response to variations in light or temperature, or as a result of a fright, or some other reaction. It is the magic of body chemicals called hormones that controls the colour changes affecting pigments of the skin, enabling them to blend with their surroundings.

Because they are very slow-moving reptiles without teeth or claws, other

hungry creatures could easily snap them up, so this ability to camouflage themselves is a protection mechanism.

Identification

The body of a chameleon is short and flat and almost leaf-shaped when viewed sideways on; and, with its tail attached like a stem to a branch, it is very easy to miss. Its size ranges in length from less than 7.5 cm for Brookesia to over 60 cm for some species of Chamaeleon. The bulging eyes of a chameleon are almost completely covered with scaly eyelids. The eyes are able to move easily and each eye can move independently of the other so that the reptile can look forward and backward at the same time.

The fingers and toes of the chameleon are specially adapted for grasping branches, being arranged in two and three digits each. Its long curling tail is also especially adapted for grasping twigs.

Habits

Most chameleons feed on insects, but a few of the larger species have been known to snare small mice and birds. Its unusually long sticky tongue is used to capture prey by means of a suction

cup at its tip. This is the only thing about a chameleon that moves fast. It shoots its tongue out at its prey with lightning speed, and enjoys another meal.

Chameleons rarely fight each other. They defend their territories by puffing themselves up in an attempt to scare away intruders. The males, in particular, often have horns or crests or flaps on their heads to make them look even more frightening.

An alarmed or angry chameleon opens its vivid red mouth and hisses loudly while crouching in a menacing position, but it is really quite harmless.

Female chameleons are mostly oviparous; that is, they lay eggs which hatch outside their bodies. A few species are ovoviviparous; that is, they produce living young within the body. In South Africa, the small *Microsaura* (or *Bradypodion*) are live-bearing, whereas the Flap-necked or East African chameleon (*Chamaeleo dilepis*), and the ground dwelling Namaqua chameleon (*Chamaeleo namaquensis*) are egg-laying.

Bibliography

Cowden, Jeanne, *Chameleons: The Little Lions of the Reptile World* (1977); Roberts, Mervin F., *All about Chameleons and Anoles* (1977).

London Bureau

VIPER VENOM IN STROKE RESEARCH

Venom from a vicious snake called the Malaysian pit viper is being injected into the veins of people who have suffered strokes in the hope of curing them.

'We have early indications that this venom-drug works, but it will be more than a year before it is sufficiently tested for it to go on the market,' said Mrs Carla Sherman, a nurse at the Health Science Centre at the University of Texas at San Antonio.

It is hoped that the drug will cure the 85% of stroke sufferers who get blood clots in the brain. This is because the Malaysian pit viper is one of the few species of snake whose venom kills its victims by causing internal bleeding. It contains an enzyme which breaks down and prevents blood clots.

The pit vipers are so named because they have a sensitive pit between each nostril and eye that enables them to aim their strikes at warm-blooded prey.

'We are carrying out our experiments with a drug company that owns a snake farm,' said Mrs Sherman. 'Every two weeks they "milk" their 400 snakes. Wearing protective gloves, they hold their heads over a bowl and force out the venom.

'We then do "double blind" tests on people who have suffered strokes within the past six hours. After that period, any brain damage suffered is believed to be irreparable. Half the patients get intravenous injections with a dilution of the venom, and half receive a dummy drug.

'Neither patient, doctor nor nurse knows at the time which patient is receiving the real drug and which the dummy. We thus test the efficiency of the drug by having a dummy to compare its effects with.

'It is too early to be sure yet whether the viper's venom is going to cure strokes. But four out of six patients who had one side of their bodies paralysed were able to walk after it'.

Submitted by: Johan Marais, Assagay Safari Park, Botha's Hill, 3660.

HERPETOLOGY 1989/90

RECENT HERPETOLOGICAL PUBLICATIONS

- ERNST, C.H. & McDONALD, B.S. Jr. 1989. Preliminary report on enhanced growth and early maturity in a Maryland population of Painted turtles, *Chrysemys picta*. *Bull. Maryland Herp. Soc.* 25(4): 135-142.
- BELL, E.L. 1989. Unique feeding habit of captive Black rat snake, *Elaphe o. obsoleta*. *Bull. Maryland Herp. Soc.* 25(4): 155-156.
- SMITH, H.M., WILLIAMS, K.L., WALLACH, V. & CHISZAR, D. 1990. The nomenclatural status of *Pelamis* Daudin, 1803 (Reptilia: Serpentes). *Bull. Maryland Herp. Soc.* 26(2): 55-59.
- TRAUTH, S.E. 1990. Flooding as a factor in the decimation of a population of Green water snakes (*Nerodia cyclopion cyclopion*) from Arkansas. *Bull. Chi. Herp. Soc.* 25(1): 1-3.
- FREED, P.S. 1990. A note on unusual behaviour in the Namib sand gecko (*Chondrodactylus angulifer*). *Bull. Chi. Herp. Soc.* 25(1): 7.
- MITCHELL, I.A. 1990. Reproduction of Gould's monitors (*Varanus gouldii*) at the Dallas Zoo. *Bull. Chi. Herp. Soc.* 25(1): 8-9.
- PETERSON, K.H. & ORR, R. 1990. An unusual mite infestation at the Houston Zoo. *Bull. Chi. Herp. Soc.* 25(1): 10.
- JANZEN, F.J. & O'STEEN, S. 1990. An instance of male combat in the Common snapping turtle (*Chelydra serpentina*). *Bull. Chi. Herp. Soc.* 25(1): 11.
- HENDERSON, R.W. 1990. Tree boas on Grenada: The colorful puzzle. *Bull. Chi. Herp. Soc.* 25(2): 21-24.
- PETERSON, K.H. 1990. Conspecific and self-envenomation in snakes. *Bull. Chi. Herp. Soc.* 25(2): 26-28.
- OLSON, R.E. 1990. Anuran populations in an environmentally ravaged land. *Bull. Chi. Herp. Soc.* 25(2): 32.
- TRYON, B.W. 1990. Bog turtles (*Clemmys muhlenbergii*) in the south - A question of survival. *Bull. Chi. Herp. Soc.* 25(4): 57-66.
- GEHRMANN, W.H. 1990. Variation in the periodicity of defecation and ecdysis in a group of sibling Emerald tree boas, *Corallus caninus*. *Bull. Chi. Herp. Soc.* 25(4): 67-69.
- SOMMA, L.A. 1990. Observations on the nesting ecology of the Prairie skink (*Eumeces septentrionalis*) in Nebraska. *Bull. Chi. Herp. Soc.* 25(5): 77-80.

VERKERK, J.W. 1990. De verzorging en kweek van de luipaardgekko (*Eublepharis macularius*) in het terrarium. *Lacerta* 48(5): 135-141.

WENZEL, D.E. 1990. Observations of captive breeding behaviour, matings and oviposition in the Eastern hognose snake (*Heterodon platirhinos*). *Bull. Chi. Herp. Soc.* 25(5): 86.

Editor: Copies of these articles can be ordered from the Secr./Treas. at 20 cents per page plus 30 cents for postage.

ABSTRACT

Chifundera, K. 1990. Snakes of Zaire and their bites. *African Study Monographs* 10(3): 137-157. The ophiological survey made in Zaire revealed the presence of 152 species of snakes included in 60 genera and in 8 families. The family Colubridae contains the largest number of genera (45) and species (97). Their geographical distribution shows that the eastern part of Kivu region contains a wide variety of species (90 species). The density of Zairean snakes has not yet been known. But in some localities like Kamanyola in the Kivu province, the density is as high as 80 individuals per square kilometer for the vipers. Other areas like Kinsuka in the vicinity of Kinshasa has as many as 10 species within the same area. Snakes are found in the forest, the savanna and in the aquatic milieu. Some species are arboreal and others live in the mountain regions. Evolutionary considerations based on the anatomical observations indicate that the equatorial forest of the Northern Zaire contains some of the most ancient and conservative forms of snakes. Some are considered to be the most evolved and specialized form of snakes in the world.

The frequencies of the snake bites at the sanitary sectors are surveyed. According to the epidemiological data on snake bites, envenomations constitute a serious problem for the public health. Mortality is 6 to 14.3% (mean 8%) of the total snake bites from 1979 to 1986. Bites are most frequent during the agricultural activities. In the savanna of Kivu, which shows the tropical climate, the bites are recorded in the rainy season. The dangerous snakes have been identified: 79 species (51%) are venomous, including vipers, elapids and opisthoglyphous colubrids which are the most dangerous. The treatment of snake bites to reduce mortality and morbidity is applied according to the principles of modern medicine (using antivenom sera) and of the traditional methods (using traditional drugs). The phytotherapy against envenomation is known in Zaire and in many other countries of Africa. Phytochemical screening of these plant drugs is being made for testing their biological activities, and the pharmacological analysis is being carried out for the confirmation of the presence of any antivenomous substance.

Key Words: Zaire; Snakes; Snake bites; Treatment; Antivenomous plants.

NO MORE FEAR, VENOMOID SNAKES ARE FINALLY HERE!!

Have you ever dreamed of keeping venomous snakes but avoided doing so, because of the ever present danger to self, family, pets, friends and community??

Now your dreams can come true, thanks to the latest technology in venomoid surgery. You would be surprised how easy it is to handle and take care of your venomoid snakes. After frequent handling the snakes become very tame. Only you and us will know this great secret.

The most important advantage of the venom glands surgery compared to milking snakes, is that when you milk a snake, the venom regenerates immediately. However this surgery prevents the process.

What is venomoid surgery?

There are two types of operations:

- (1) **The ordinary conventional way:** Only the venom duct is separated and sealed, preventing the venom from flowing into the fangs. This method was very acceptable until now, however the duct can regenerate naturally. Sometimes, due to increasing pressure in the sealed glands, the seal can re-open and the venom can flow out into the hollow fangs. This can occur suddenly, like a time bomb and then you're in serious danger!
- (2) **Our special method:** The duct with the whole venom glands are taken out with no harm done to the muscles, blood vessels and nerve connections which are inside and surround them. This surgery is unnoticeable. Because the whole venom system has been removed, it can never be operational again as can occur with duct ligation.

This method had been examined on hundreds of different specimens of all ages (including hatchlings and newborn). Evaluation after several years revealed muscles and facial tissue had filled in the former venom glands space.

Another very conspicuous advantage is that the venomoid snakes behave normally and feed immediately (large prey must be killed). Unlike duct ligation method, which can result in high pressure in the sealed venom glands disturbing these snakes and may decrease their desire to breed or eat.

Why should your pet be venomoid:

- (1) Complete safety while handling your snake: about 620 snake lovers are bitten severely every year. All of them were sure: "It will never happen to me."
- (2) Total security for your family, friends, and the community (if your pet accidentally escapes).

- (3) To totally eliminate venom gland infections.
- (4) To avoid the necessity and heavy expense of storing antivenins - especially for rare species. Remember they must be replaced regularly to keep them fresh.

Venomoid surgery is not recommended for other than healthy snakes and snakes that are not going to be released back in the wild.

VENOMOID SURGERY - PRICE LIST

	Your snake (\$)	Our snake (\$)
Pigmy rattlesnake	60	95
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Green Bamboo Viper	75	187
Palestinian viper	87	187
Sawscaled Viper	87	150
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For each snake that undergoes venomoid surgery, the owner will receive a written guarantee that his/hers animal has been rendered harmless, accompanied by the whole venom glands system, mounted on a card with fully labeled anatomy.

Any other snake can be ordered even if it's not on the list.

All orders must be given 2-3 weeks before.

We give reductions for large orders.

As a final note, **caution:** (1) Similar care should be exercised with venomoid snakes as with other snakes, such as Boas and Pythons. Beware especially of the Crotalids and Viperids as they have long fangs, and are capable of inflicting a painful bite.

(2) Remember if you breed your venomoid snakes, the babies are still venomous, so don't forget us next time!!

For further details we're looking forward to hear from you.

Yours sincerely

Yaacov Pesach
Devenopet Laboratories
P.O. Box 11, Stone Ridge N.Y. 1248

SYMPOSIA

THE WORLD CONGRESS OF HERPETOLOGY ANNOUNCES

THE SECOND WORLD CONGRESS OF HERPETOLOGY

December 29, 1993 - January 5, 1994

at the University of Adelaide, Adelaide, South Australia

The Executive committee of WCH has considered the venues proposed during FWCH in Canterbury and after voting decided on Adelaide as the venue for the SWCH. This international congress is the second of a series that started in 1989 in Canterbury. This meeting will enable all persons interested in herpetology to meet and exchange information to promote the advance of knowledge and the conservation of the world's amphibians and reptiles. The congress will consist of topical symposia, plenary speakers, poster sessions, workshops, displays, excursions, and meetings of ancillary groups. Subjects and moderators will be announced well in advance so that potential participants can volunteer. The meeting will be open to all persons. Registration will begin 1 January 1992.

Further announcements about registration, travelling arrangements, accommodation and program will be made in herpetological journals as soon as available.

The congress will offer you the opportunity to get acquainted with the unique and diverse Australian herpetofauna.

For further details and mail listing, write: Dr. M.J. Tyler, The University of Adelaide, Dept. Zoology, Box 498, G.P.O. Adelaide, South Australia 5001, Australia.

Sponsoring organizations and individuals are welcome. For further details write: Dr. R.L. Carroll, Treasurer WCH, Department of Biology, McGill University, 1205 Docteur Penfield Avenue, Montreal, PQ, Canada H3A 1B1.

APPEALS AND REQUESTS

**APPEAL FOR INFORMATION
CROCODILE ATTACKS ON HUMANS**

I have been researching the incidence of crocodile attacks on humans over a number of years for a book to be published on this subject. Before completing this manuscript I am appealing for additional information, in particular, eye-witness accounts or details of attacks, such as locality, date, sex, age, race, actions of the victim when attacked, the nature of injuries inflicted, how the victim managed to escape death, or if attack proved fatal, whether the body was recovered, etc.

Of particular value would be photographs or colour transparencies of wounds or corpses, and details of medical treatment to wounds of survivors. Obviously all information of relevance will be acknowledged and included in the text.

Please write to me at the following address:

Tony Pooley
P.O. Box 295
Scottburgh
4180
Natal
South Africa

REQUEST FOR VARANID GUT CONTENTS AND GONADS

As part of an on-going study of the ecology of southern African varanids, we are making an appeal to southern African herpetologists for assistance in obtaining gut contents and gonads from monitor lizards (leguaans). Varanids are protected species and we ask only that material be collected from natural casualties (eg. road kills, problem animals, etc.) or expelled food (eg. faeces or regurgitations). Specimens should not be killed intentionally.

Material should be preserved in buffered 10% formalin (particularly gonads) or 75% alcohol and tightly sealed in robust bottles, with a collection card listing: species, locality, date, sex, collector and approximate snout-vent length of the specimen. If the specimen remains sufficiently intact for deposition in a museum collection, its location and catalogue number is also helpful. Specimens can be sent (COD if necessary) to Dr W.R. Branch (Port Elizabeth Museum, P.O. Box 13147, Humewood 6013, South Africa).

We will acknowledge fully all assistance in the resultant publication(s).

**Bill Branch (Port Elizabeth Museum) and
Andy Phillips (Etosha Ecology Institute)**

APPEAL FOR INFORMATION

I would like to hear from anyone with information and/or literature references on reproduction in *Mabuya homalocephala* and/or *Chamaesaura macrolepis*.

Johan Marais, Assagay Safari Park, Botha's Hill, 3660. Tel. no. (031) 7771205.

HELP REQUIRED

I am looking for:

- i) any information on reproduction in southern African snakes,
- ii) rare and unusual live snakes for photographic purposes and
- iii) colour slides of southern African snakes

for use in the second edition of my book *Snake vs Man*, which will be a comprehensive field guide to the snakes of southern Africa. All assistance will be acknowledged.

Johan Marais, Assagay Safari Park, Botha's Hill, 3660. Tel. no. (031) 7771205.

AMPHIBIA ZAMBESIACA

I am looking for an original set of the four part series *Amphibia Zambesiaca*, by J.C. Poynton and D.G. Broadley, published in the *Annals of the Natal Museum*.

Johan Marais, Assagay Safari Park, Botha's Hill, 3660. Tel. no. (031) 7771205.

OTHER SOCIETIES

The goal of Varanix, the Varanid Information Exchange, is to serve the interests of Varanids and Varanid-keepers throughout the world. A primary function of the Exchange is to build and maintain a knowledge base that will help improve the standard of living of these magnificent creatures in the captive world.

VaraNews is the newsletter of Varanix.

All inquiries about Varanix can be directed to:

Greg Naclerio
8726D S. Sepulveda Bl. #243
Los Angeles, CA 90045

Attn: Varanix

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Owing to numerous problems, members are kindly requested **not** to submit payments directly to any Building Society or Bank account. all payments must be submitted to:

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PLEASE STATE IN WHICH YEAR YOU REQUIRE MEMBERSHIP TO BEGIN. MEMBERSHIP RUNS FROM 1 JANUARY TO 31 DECEMBER OF ANY YEAR. SHOULD MEMBERSHIP BE TAKEN OUT IN THE LATTER PART OF THE YEAR, YOU WILL RECEIVE ALL JOURNALS AND NEWSLETTERS PERTAINING TO THAT YEAR.