ISSN 1017 - 6187

AFRICAN HERP NEWS

NO. 20: DEC 1993

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AFRICAN HERP NEWS

HERPETOLOGICAL ASSOCIATION OF AFRICA NEWSLETTER

DECEMBER 1993 NO. 20

HERPETOLOGICAL ASSOCIATION OF AFRICA
MEMBERSHIP FEES AS AT 1 JANUARY 1994

AFRICAN MEMBERSHIP

ORDINARY MEMBERSHIP

1 year membership **R40.00.** Submit in Rand or equivalent U.S. Dollar plus 10%.
3 year membership **R110.00.** Submit in Rand or equivalent U.S. Dollar plus 10%.

SCHOLARS MEMBERSHIP

1 year membership **R30.00.** Submit in Rand or equivalent U.S. Dollar plus 10%.

OVERSEAS MEMBERSHIP

DOLLAR PAYMENTS

1 year membership **$25.00.** Submit in U.S. Dollars by personal cheque or money order.
3 year membership **$70.00.** Submit in U.S. Dollars by personal cheque or money order.

RAND PAYMENTS FROM OVERSEAS

1 year membership **R80.00.** Submit in ZAR or Rand by bankers draft or money order.
3 year membership **R220.00.** Submit in ZAR or Rand by bankers draft or money order.

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

THE SECRETARY/TREASURER
HERPETOLOGICAL ASSOCIATION OF AFRICA
P.O. BOX 20142
DURBAN NORTH
4016 REP. SOUTH AFRICA

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.

EDITORIAL

The *Third H.A.A. Symposium on African Herpetology*, held at the Transvaal Museum in Pretoria from 11-15 October 1993, was a great success. Fifty-four delegates attended and 43 papers, as well as several posters, slide shows, videos and a computer demonstration, were presented. The *FitzSimons Commemorative Symposium* took place on the second day, during which time presentations were made covering our current knowledge of taxonomic relationships of all southern African lizard and amphisbaenian families.

Two awards were presented at the Official Dinner, the first, namely the *Certificate of Loyal Service*, was presented to Dr W.R. Branch for 11 years service as Journal Editor, while the third *Exceptional Contribution to African Herpetology* award was presented, *in abstentia*, to Dr R.F. Laurent for over fifty years of contributions to the herpetology of Central Africa. With regard to this award, H.A.A. members are now invited to submit names of candidates they feel are deserving of this honour. The guidelines for the presentation of this award are published on pages 24-25.

The H.A.A. is grateful to Mr W.D. Haacke and his team of symposium co-ordinators for the splendid job they did in organizing the symposium. The proceedings of the symposium are presented on pages 4-20 of this newsletter.

The next H.A.A. symposium will probably be held in Durban or Pietermaritzburg in about two years time, but this has yet to be confirmed.

After 11 years of dedicated service as Journal Editor, Dr Bill Branch has decided to take a break. The H.A.A. Committee has co-opted Dr Le Fras Mouton onto the committee as Journal Editor. I am sure he will quickly adapt to his new post and make a significant contribution. As many of you already know, an Editorial Committee for the journal was recently formed. In association with Le Fras and the rest of the H.A.A. Committee, they have decided on a new editorial policy for the journal (see page 21). The emphasis is now on quality scientific articles with the aim of achieving accreditation status for the journal within a year or two. This means that, with immediate effect all contributions to the following sections of the journal should be submitted to *African Herp News*, and not the journal: Life History Notes, Geographical Distribution, Venoms and Snakebite, Herpetological Literature lists and *short* Book Reviews.

Please take note that this change does not mean that any short communications are no longer of value to the H.A.A., but simply means a change in the publication medium in which they will be published. Also, "Short Notes" may be published in the Journal if they are of the "type" published in other recognized journals (e.g. *S. Afr. J. Zool.*, *Copeia*, *Ostrich*). H.A.A. members (and non-members) are urged to put pen to paper and help play a role in making the Journal a more internationally recognized publication. Contributions to *African Herp News* are also eagerly awaited.

The General Meeting at the Pretoria symposium was poorly attended. Only 27 H.A.A. members were present, three less than the minimum of 30 required by the Constitution to represent a quorum. I therefore urge all members who were not able to attend the

meeting to respond to the voting request on page 18. We need at least three responses in order to make any proposals "legal".

As usual, I would like to end by thanking all contributors of articles and new items for this issue of *African Herp News.*

All the best for 1994.

Mike Bates
Chairman/Newsletter Editor

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HERP-INFO

Advertisement rates:

H.A.A. members:	No charge.
Non-members:	R7.50 per 50 words or part thereof. Over 50 words R4.00 per 15 words or part thereof. Any request for information regarding research and studies will be printed free of charge.

Advertisements with payments made payable to the Herpetological Association of Africa should be sent to: Rod Douglas, H.A.A. Herp-Info, National Museum, P.O. Box 266, Bloemfontein 9300.

The Editor retains the right to exclude any advertisement from publication. The Editor will presume that any persons placing advertisements and/or responding to advertisements shall be fully aware of any regulations and laws governing the sale of reptiles and amphibians in his/her area, and no correspondence will be entered into regarding these matters. Neither the Editor nor the H.A.A. shall be held responsible for any legalities or claims arising from advertisements. **Requests from foreign countries for African species will not be published.**

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WANTED

Back issues of the H.A.A. Journal. I require back issues of the H.A.A. Journal from no. 1 to no. 25. Please send list of issues available with prices to: **Mr F. J. Obst, Staatliches Museum vur Tierkunde, Augustus Strasse 2, D-01067 Dresden, Germany.**

Information on Rinkhals. I am at present involved with a breeding programme on banded Rinkhals (*Hemachatus haemachatus*). Anybody with any information on this species, particularly persons from the areas in which they occur, can please contact: **Mr T. Dillon, 30012 Hubert Jenkins Road, Bogalusa, L. A. 70427, U.S.A.**

Information on tortoises. I am at present busy with breeding programmes on *Homopus*, *Psammobates* and *Chersina*. Anybody with any information on these species can please contact: **Mr E. J. Akaba, 2554 Lincoln Boulevard #355, Venice, California 90291, U.S.A.**

Slides. Slides of six different sea snake species required, as well as one slide of a very large anaconda, ideally with person or persons in the shot to indicate the size of the snake. These slides are required for publication in a book on snakes. Contact: **Johan Marais, P.O. Box 5142, Halfway House 1685. Tel. (B) (011) 315-3633, Fax. (B) (011) 318-1411.**

FOR SALE

Black x Yellow Rat Snake X Black x Yellow R akes (F2) (*Elaphe obsoleta obsoleta x E. o. quadrivittata* X *E. o. obsole .. o. quadrivittata*) and Black X Black x yellow rat snake (*E. o. obsol E. o. obsoleta x E. o. quadrivittata*). Hardy and ideal for beginner ebruary/March 1994 hatchlings at only R70.00 each. Packaging and t cost extra if required. Contact: **Rod Douglas, P.O. Box 266, Bl tein 9300. Tel. (H) (051) 36-5052, (W) (051) 47-9609.** SOLD SOLD SOLD

Book. *Giant Lizards* by Sprackland, R. in mint condition. One copy only at R220.00. Contact: **Johan Marais, P.O. Box 5142, Halfway House 1685. Tel. (B) (011) 315-3633, Fax (B) (011) 318-1411.**

Book. *Conservation and utilization of the Nile crocodile - A handbook on Crocodile farming* by Smith, G.A. & Marais, J.J. Stock has just arrived at R110.00 inc. postage; overseas price $33.00 inc. surface mail. Cheques, postal orders and money orders made payable to: Crocodilian Study Group of Southern Africa. Orders to: **Prof. G.A. Smith, Department of Animal Science, Faculty of Agriculture, University of Pretoria 0002, South Africa.**

Books. Books on reptiles and amphibians for sale. For catalogue containing over 4000 titles please send $6.00 for air mail return postage to: **Herp Search Service & Exchange, 117 E Santa Barbara Road, Lindenhurst, N. Y. 11757, U.S.A.**

Corn snakes (*Elaphe guttata guttata*). Febr /March 1994 hatchlings at R90.00 each Packaging and freight cost extr required. Contact: **Rod Douglas, P.O. Box 266, 9300 Bloemfontein. (H) (051) 36-5052; (W) (051) 47-9609.** SOLD

Rock Pythons. Two medium size (over two meters) female *Python sebae natalensis* with permits. Contact: **Rod Douglas, P.O. Box 266, 9300 Bloemfontein. Tel. (H) (051) 36-5052; (W) (051) 47-9609.**

Snake tongs. Back on the market, snake tongs with wooden handles at R120.00 plus postage if applicable. For further information contact: **Leon Dedenczuk, 71 Strydpoort Street, Albertsal 1449. Tel. (B) (011) 636-7672, (H) (011) 900-1299.**

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THIRD H.A.A. SYMPOSIUM ON AFRICAN HERPETOLOGY

11 - 15 OCTOBER 1993

TRANSVAAL MUSEUM, PRETORIA SOUTH AFRICA

The *Third H.A.A. Symposium on African Herpetology* was held from 11-15 October 1993 at the Transvaal Museum in Pretoria. The symposium was attended by 54 delegates from five countries, namely South Africa, Swaziland, Zimbabwe, Germany and the United States. Forty-three papers, 20 posters, 4 slide shows, 3 videos and a computer demonstration were presented. Topics covered included taxonomy, phylogenetics, biogeography, behaviour, reproduction, ecology, conservation, reptile husbandry, snakebite and parasitology.

The *FitzSimons Commemorative Symposium* was held on the second day of the symposium. This involved various selected speakers presenting papers dealing with the taxonomic status of particular lizard families or genera, while the suborder Amphisbaenia was also discussed. The "Fitz" mini-symposium celebrated 50 years since the publication of V.F.M. FitzSimons' *Lizards of South Africa* in 1943.

Two awards were presented during the symposium. The H.A.A. *Certificate of Loyal Service* went to Dr W.R. Branch, journal editor, for over a decade of service to the H.A.A. The H.A.A. *Exceptional Contribution to African Herpetology* award was presented, *in abstentia*, to Dr R.F. Laurent for his many years of contributions to our knowledge of Central African herpetofauna.

The H.A.A. is grateful to the co-ordinating committee of the symposium, namely Mr. W.D. Haacke (Chairman), Dr. N.H.G. Jacobsen, Miss S. Ritter, Mrs. L. Brown and Mrs. G. Pieterse.

The following pages record the proceedings of the symposium, and should provide those members who were unable to attend with some idea of what they missed.

REPORT OF THE CHAIRMAN

M.F. Bates

Department of Herpetology, National Museum
P.O. Box 266, Bloemfontein 9300, South Africa

It has been two-and-a-half years since our last symposium in Bloemfontein during April 1991. Much has happened since then, including the election of a new H.A.A. committee in November 1992. Personally, it has been an honour for me to have served on the H.A.A. committee, and I have greatly appreciated the input of fellow committee members.

The H.A.A. and its committee function according to the Association's constitution, and a set of resolutions and by-laws drawn up after a special H.A.A. committee meeting held in Bloemfontein on the 4th of April 1990. Communication between myself and other committee members is conducted by means of letters, faxes and telephone calls. Once every two months I send a letter to all committee members providing them with the latest information pertaining to the H.A.A. as a whole. Committee members are asked for their opinions on various matters, and are then requested to complete a voting form. Decisions are taken on the basis of a majority vote.

Two important matters were finalized by the present committee:

i. The first was the compilation of a set of guidelines to be used when evaluating candidates for the *Exceptional Contribution to African Herpetology* award (presented for the first time at the Bloemfontein symposium). A notice will be placed in the next newsletter explaining how any paid-up member of the H.A.A. can nominate a person for this award. In accordance with the guidelines, the H.A.A. committee decided that Dr Raymond Laurent should receive this year's award.

ii. The second important matter finalized by the committee was the establishment of an Editorial Committee for the H.A.A. Journal. This will be discussed in more detail by Dr Branch in his report.

On behalf of all H.A.A. members I would like to thank Mr Frank Farquharson for his tireless and seemingly thankless work as Secretary/Treasurer. Few of us realize how much time is involved in performing the duties of both Secretary and Treasurer. The responsibility of Journal Editor requires as much hard work and dedication, and we should all be particularly thankful to Dr Bill Branch, who has been at it for over a decade. Bill, we can only hope that the *Certificate of Loyal Service*, presented to you at the Official H.A.A. Dinner on Tuesday night, will represent our combined appreciation for eleven years of dedication. I would also like to thank Gerald Haagner and Richard Boycott who have so enthusiastically assisted Bill as sub-editors of the Journal. Last but not least, I thank all Additional Committee Members for responding so timeously to my lengthy letters, and also for contributing material for the newsletter. A special word of thanks to Prof. John Poynton, who, despite being far away in England, has made as meaningful a contribution as our local Additional Committee Members.

On behalf of the H.A.A., I would like to thank Mr Wulf Haacke and his very worthy team of symposium organizers (including Dr Niels Jacobsen, Miss Stephanie Ritter,

Mrs Lomi Brown and Mrs Geraldine Pieterse) for a splendid and very worthwhile symposium. Thanks also to the Transvaal Museum for the facilities provided and for sponsoring the FitzSimons Commemorative Symposium and Official Dinner, and ESKOM for the *Cordylus* outing, folders and key holders. Mr Pieter Bos is also acknowledged for his contribution towards the cost of the key holders.

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REPORT OF THE NEWSLETTER EDITOR

M.F. Bates

Department of Herpetology, National Museum
P.O. Box 266, Bloemfontein 9300, South Africa

In my capacity as Newsletter Editor I would like to take this opportunity to thank all contributors of articles and news items for recent issues of *African Herp News*, including Orty Bourquin for his excellent series about herpetofauna on postage stamps, Bill Branch for his enlightening Book Reviews and Rod Douglas for the useful Bibliographic index to Journals no. 1 to 38. It is good to know that the newsletter is so well supported by local and overseas H.A.A. members.

Some changes have been made to the format of *African Herp News*, but the general format used since I first began editing the newsletter, in other words since no. 13, is still being adhered to. Subsequent to my report at the Bloemfontein Symposium, five newsletters have been produced. This is an average of two, fairly thick newsletters per year. Although it was announced at that time that three newsletters would be published each year, the high costs involved have made this unfeasible. The cost of one copy of the last newsletter was about R7-40, excluding postage and envelopes. All factors considered, the newsletter is produced at a very reasonable cost. Members should also be aware of the fact that printing costs increase by about 15% per year.

It has been possible to keep the production costs of *African Herp News* down for the following reasons:

i. The National Museum provides free typing services and lazer-printing facilities to the H.A.A.
ii. Proof reading of articles, as well as production of paste-ups, are done by myself, and
iii. We have managed to acquire the services of a printer (publisher) for exceptionally low cost to the H.A.A.

In conclusion, I am pleased to say that all is well with the Association.

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REPORT OF THE JOURNAL EDITOR

W.R. Branch

Department of Herpetology, Port Elizabeth Museum
P.O. Box 13147, Humewood 6013, South Africa

This is my last report as Journal Editor. I have served for 11 years as editor, during which period 14 issues of the Journal have appeared. This is considerably less than the ideal of two issues per year that I had hoped to attain. However, the journal can only appear when it has sufficient written support from its members, and this has not always been forthcoming, particularly in the early years. I have often been forced to present my own work in the journal, even though I knew it could appear in more 'prestigious', accredited outlets and I would therefore be affecting my chances for local, grant-aided research support by publishing in a non-accredited outlet. The lack of support is a continuing problem that I bequeath to my successor. May he have better support from his scientific colleages.

My period of office, however, has not been noted only for the tardy appearance of the journal. There has been some marked improvement in the appearance and content of the journal. My first issue, which appeared ten years ago this month, saw an improved hard cover, the regular appearance of a photograph on the cover, and centre-folded, stapled binding. Subsequently the cover has become glossy, and has included colour photographs on three occasions. Early issues contained 20-30 pages, but all recent journals have contained at least 48-60 pages, whilst the two conference proceedings (vols. 36 and 40) contained 80 and 108 pages, respectively. Although articles in early issues were subject only to editorial review, for the last three years articles have been subject to peer review. This is a double-edged sword, and although the quality of articles has improved, it has also meant that some articles are now rejected.

The quality of scientific papers appearing in the journal has continually improved, and the latest issue sees the first description of a new species within the pages of the journal. It should be noted that this contribution, which would have been accepted in any herpetological journal worldwide, is by an Egyptian author, indicating again the wide support that the journal is gaining.

The early period saw joint production of the journal with the National Museum, Bloemfontein (1983-1987), but postal difficulties and escalating costs of printing caused complications. To buffer the H.A.A. from these costs I initiated computerized desk-top publishing techniques in 1988, and all subsequent issues have been prepared camera-ready for off-set litho printing in Port Elizabeth. This constitutes a tremendous saving for the H.A.A., with the last issue costing only R2813,20 for 450 copies. All ancillary computer costs and laser printing of galleys, etc. have been carried either by the Port Elizabeth Museum or by my core grant support. During the last four years I have received editorial support from Richard Boycott for the onerous task of proof-reading. For the last two years Gerald H.A.A.gner has also been of considerable editorial assistance, and I take this opportunity to thank them both publicly and profusely for their help.

Editorship of a journal is a delicate compromise supplying material that will be of interest to the broad membership of the H.A.A. To attempt a balance between these different audiences I first initiated a 'Newsletter' in 1983. First simply xeroxed and popular, it was later taken over by Mike Bates and his colleagues in Bloemfontein, where it has grown considerably. I also copied successful themes from *Herpetological Review*, the news outlet for the S.S.A.R., including 'Life History Notes' and 'Geographical Distribution'. I furthered this in later issues by introducing a section on 'Venoms and Snakebite'. This was not designed as a regular column for Gerald, but rather to serve as a useful and important outlet for unusual snakebite cases that would not be published elsewhere. It has been very successful, and has the support of the medical profession.

In recent years I have utilized the journal as a vehicle for publication of the papers presented at H.A.A. symposia. In some cases this allowed contributors to publish papers that would have had difficulty finding an outlet in the conventional scientific literature. In addition, by initiating 'extended abstracts' and by begging, I also managed to get some support from my scientific colleagues who presented papers, but were reluctant to publish within the journal.

In all I have found my spell as editor of the H.A.A. Journal very rewarding. I have learnt a considerable amount, not only about herpetology. I leave now with regrets, but with confidence that the new Editorial Committee will continue to lead the journal down the road to fuller acceptance in the herpetological and wider scientific community. It will be a pleasure to open an envelope with a NEW journal in it, and read something that I haven't spent the last six months bringing to fruition!

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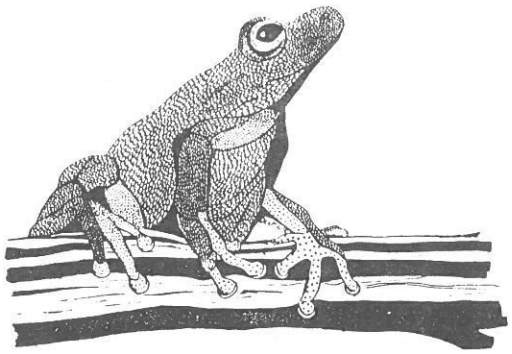

REPORT OF THE SECRETARY/TREASURER

F.L. Farquharson

University of Durban-Westville, South Africa

In the African category we have 178 members (as at 1993/02/28), the majority of whom live in South Africa, although Botswana, Malawi, Namibia, Swaziland, Uganda, Zambia, Ethiopia and Zimbabwe are also represented. Postal deliveries to Ethiopia, Kenya and Tanzania seem erratic and members have been temporarily suspended - letters appear to get through but Journals and Newsletters go astray? Included in the African Category are four copyright libraries and seven life members.

In the overseas category we have 146 members of which the majority are in the U.S.A. (64). The remainder are as follows:

Germany	29
UK	18
Australia	7
Netherlands	4
Belgium	4
Switzerland	4
Canada	4
Sweden	3
Denmark	3
France	2
Italy	2

Poland, India, Austria, Argentina, Brazil, Spain, Japan, New Zealand and Hong Kong are each represented by one member. The overseas category includes 8 exchange members, 3 life members and 1 index journal. With the removal of sanctions against South Africa I confidently expect a substantial increase in overseas membership next year in spite of the financial recession.

Regrettably some people join only for a year and others are remiss (or tardy) in paying their fees, with the result that I have to send reminders with a warning of suspension (fees fall due on 1 January every year). These seem to be taken in good spirit and a fair percentage pay up. Where membership has lapsed, several individuals felt our Association sufficiently worthwhile to pay the outstanding amounts as well as a rejoining fee. Nonetheless, 25 memberships were suspended this year.

To bring you further up to date - we have had another 19 African and 13 Overseas Members join so far this year, so as at 1 October 1993 our total membership stands at 332.

Now wearing my Treasurer's hat, I will briefly comment on the H.A.A.'s finances: you will have seen the audited reports for the years 1991/92 and 1992/93 published in *African Herp News* #17 and #19 respectively, and also comments in regard to the increase in fees for 1994 (*African Herp News* #19).

Since taking over from Rod Douglas, the auditing procedures have changed somewhat from a "receipts and payments" system to the modern "cash flow" system. I believe this gives the best possible view of the H.A.A.'s business. There are however, some anomalies, as our membership year runs 1 January to 31 December while our financial year runs 1 March to end of February. To confuse the issue further - our journal can be dated one month, issued in another and paid for in the next year.

The cost of the Journal remains our biggest item of expenditure, and while we produce a volume at approximately nine-month intervals, it is obvious that the cost of two issues of the journal will appear in some financial years, with only one in the others, which makes for somewhat erratic fluctuations in the H.A.A.'s balances. In this regard I voice the H.A.A.'s most grateful thanks to the anonymous donor for paying the major cost of printing Journal #40. This very generous donation enabled us to post a moderate surplus into the coming year's accounts and allowed us to print Journal #41 without digging into our reserves.

We have 24 non-contributing members (exchange, copyright, life, etc.), which is 7,2% of all members. I feel this is not excessive. While the Dollar/Rand exchange rate has continued to rise, this has been very much in our favour. However, if it really reached 1:4 then the cost of clearing Dollar cheques rises substantially with consequent reduction in overseas income.

I would like to take this opportunity to thank my fellow Committee Members, particularly the editors of the Journal and Newsletter, for their continued assistance in keeping down all our expenses. Currently, and I believe for 1994 also, the H.A.A.'s finances are in a healthy state.

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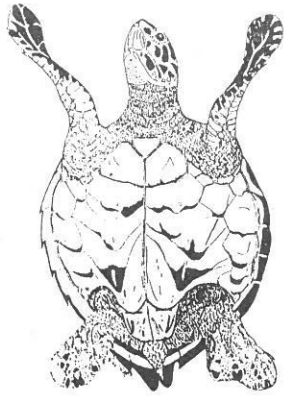


OFFICIAL DINNER AND AWARD CEREMONY

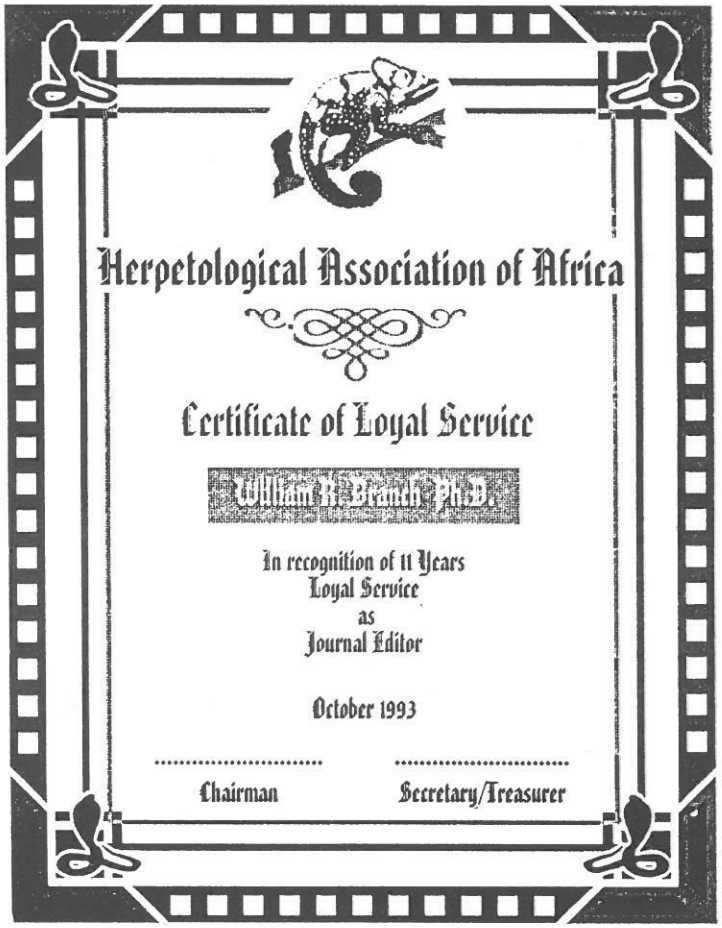
Introduced by Mike Bates
National Museum, P.O. Box 266, Bloemfontein 9300, South Africa

Ladies and gentlemen, may I start by welcoming you all here tonight, after what has been a splendid beginning to what I am sure will prove to be an unforgetable symposium. 1993 is a particularly significant year for southern African herpetology in that it marks the fiftieth year since the publication of the first Memoir of the Transvaal Museum, on *The lizards of South Africa*, by the legendary Vivian FitzSimons. It is my conviction that today's FitzSimons Commemorative Session was a most suitable way of paying tribute to the work of a great scientist, who's numerous publications are still of immense importance to this day. 1993 is also the centenary year of the Transvaal Museum, which adds additional historical significance to this the *Third H.A.A. Symposium on African Herpetology.*

A great many people were involved in organizing and convening this symposium, but I have been asked at this time to make reference to only some of these worthy individuals. Firstly, on behalf of all delegates present here today, may I express my sincere thanks and appreciation to the Director of the Transvaal Museum, Dr Naas Rautenbach, for making available these premises to the H.A.A., and also for sponsoring the Official Dinner. We are also most grateful to Mr Roger Dickson, Director of the Geological Museum, for the use of the Auditorium. The H.A.A. is also particularly grateful to Eskom who will be sponsoring the *Cordylus giganteus* outing as well as the folder and key ring on Thursday. Mr Pieter Bos very kindly contributed financially to the production of the key ring. On behalf of all of us here tonight, I would like to thank Mr Wulf Haacke and his very capable team of symposium organizers for their hard work in organizing this event. Last, but not least, thanks go to Ms Leda McLoud and her assistants for catering for tonight's function.

The H.A.A. will be making two award presentations tonight. Both go to individuals of high standing in the herpetological community. The first of these awards goes to Dr Bill Branch, editor of the H.A.A. Journal for the past 11 years. As some of you already know, Bill will no longer be editing the journal. Bill's hard work and scientific skills have resulted in a rapid evolution of the journal from a bulletin type publication to a very well formatted scientific journal which, it is hoped, may soon acquire accreditation status. Bill's name has been synonymous with the H.A.A. ever since I can remember, **and it is therefore with great pleasure that I now ask Bill to come up and receive the first H.A.A. Certificate of Loyal Service.**

At the Official Dinner of the H.A.A. Symposium in Bloemfontein in April 1991, the first two *Exceptional Contribution to African Herpetology* awards were presented, to Prof. John Poynton and Dr Donald Broadley, both legends in their own time. The award was initiated with the purpose of honouring those who have been truly exceptional in the field of African herpetology. For that reason, the H.A.A. Committee decided that it was time to honour another great name in African herpetology. Unfortunately the recipient of this year's award, Dr Raymond Laurent, was unable to attend the symposium despite his initial desire to do so, but he was most grateful and felt particularly honoured when first informed of our intention to honour him in this



way. He nevertheless prepared a paper on the frog genus *Ptychadena* in Africa, which Mr Frank Farquharson has kindly agreed to present at this symposium. **It is with great pleasure that I now ask Dr Donald Broadley to come up and discuss the achievements of the recipient of the third** *Exceptional Contribution to African Herpetology* **award.**

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EXCEPTIONAL CONTRIBUTION TO AFRICAN HERPETOLOGY AWARD

Presented by Donald G. Broadley
Natural History Museum, P.O. Box 240 Bulawayo, Zimbabwe

RAYMOND FERDINAND LOUIS PHILIPPE LAURENT
(Born 16 May 1917 in Wasmes, Belgium)

I consider it an honour to be asked to present the background to the third *Exceptional Contribution to African Herpetology* award to a man who has for fifty years made major contributions to our knowledge of the amphibians and reptiles of Central Africa, Dr Raymond Laurent.

RAYMOND FERDINAND LOUIS PHILIPPE LAURENT was born at Wasmes, Belgium on 16th May 1917. His university education was at the Université Libre de Bruxelles, culminating in his D.Sc. in 1940, with a thesis on the osteology and systematics of African Ranidae and Rhacophoridae. His first papers, on African amphibians, were published in the *Revue Zoologique et Botanique Africaine* in 1940 and during 1941-43 he concentrated on elucidation of the *Hyperolius* radiation through the osteology and ontogenesis of the colour pattern. His first papers on African reptiles appeared from 1942, mostly in collaboration with Gaston de Witte. A most notable publication during World War II was his "Contribution á la connaissance du genre *Atractaspis*" in 1945. This was followed by an important paper in collaboration with Gaston de Witte in 1947, "Revision d'un groupe de Colubridae africains: genres *Calamelaps, Miodon, Aparallactus* et formes affines". Laurent held an appointment at the Tervuren Museum from 1948 to 1961, but spent the years 1951, 1955 and 1956 at the Institut pour la Recherche Scientifique en Afrique Centrale (IRSAC) in Uvira and from 1957 to 1960 as a Professor at the University in Elizabethville. In 1950 there appeared the first of the series of lavishly illustrated volumes on the herpetofauna of the National Parks of the Belgian Congo, Laurent's first contribution covered the genera *Afrixalus* and *Hyperolius* in the Parc National Albert. A revision of the genus *Atractaspis* appeared in the same year, when he concluded that the genus did not belong in the family Viperidae.

In 1956 Raymond published a large volume entitled "Contribution á l'Herpetologie de la Région des Grands Lacs de l'Afrique Centrale", which covered the chelonians and snakes, including many descriptions of new forms. A supplementary volume appeared in 1960.

I first made contact with Raymond early in 1961, when he was at the Université de l'Etat in Elizabethville, Katanga. Soon afterwards, when the Congo sank into anarchy, Laurent moved to the Museum of Comparative Zoology at Harvard, where his work was funded by the National Science Foundation until 1964. During this period he published his third (and largest) contribution on the reptiles and amphibians of Angola in the Diamond Company series, in addition to revisionary studies on the races of *Kinixys belliana*, the genus *Hemisus*, the *punctatus* group of African *Typhlops* and geographical variation in *Hyperolius marmoratus*.

From 1964-1967 Laurent held a post at the Fundacion - Instituto Miguel Lillo in San Miguel dē Tucuman, Argentina. Consequently many of his later publications dealt with the amphibians and reptiles of South America, but he also continued to make significant contributions to the herpetology of Africa. These included an important review of the genus *Pelusios*, notes on the amphibians and reptiles of Somalia (partly in association with Carl Gans), both in 1965; a review of the genus *Lycophidion* (1967), a revision of the genus *Hemisus* (1972), a report on the amphibians of the Parc National Virunga (1972) and review of the genus *Leptopelis* in Zaire (1973). Most of Raymond Laurent's recent papers on the African herpetofauna have dealt with the amphibians. Exceptions include a chapter on herpetofaunal relationships between Africa and South America (1979) and a chapter on the herpetofauna of central African montane forests (1983). His major recent amphibian papers have dealt with the genera *Cryptothylax*, *Phlyctimantis* and *Kassina* in central Africa (1976), the superspecies *Hyperolius viridiflavus* (1976, 1983), *Arthroleptis*, *Schoutedenella*, Hemisidae and Hyperoliidae in *Amphibian Species of the World* (1985) and the systematic position of the genus *Afrixalus* (1987).

Raymond Laurent has published over 200 scientific papers (including a few on arachnids), of which 108 deal with the African herpetofauna.

Raymond Laurent was awarded the Lamarck prize of the Royal Academy of Belgium in 1943 and 1979. In 1977 he was given the Diploma de Honor al Merito by the Faculty of Sciences and Museum of La Plata. In 1989 he was President of the *Symposium on Evolution and Phylogeny of Frogs* at the First World Congress of Herpetology at Canterbury, when I met him for the first time.

Unfortunately Raymond Laurent could not be with us here tonight, but we take pleasure in awarding to him *in absentia* the H.A.A. *Exceptional Contribution to African Herpetology* award as a small token of our esteem.

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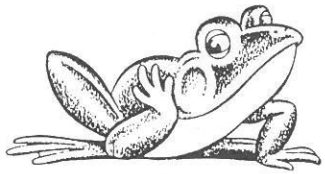

MINUTES OF THE GENERAL MEETING HELD ON FRIDAY 15 OCTOBER 1993 AT THE TRANSVAAL MUSEUM

1. APOLOGIES
   Dr O. Bourquin
   Dr P. le F.N. Mouton
   Mr R.C. Boycott
   Mr R.J. Hall
   Mr R.M. Douglas
   Dr Branch requested that the lack of support from members be minuted as very few apologies were given.

2. MINUTES OF PREVIOUS GENERAL MEETING HELD IN BLOEMFONTEIN ON 11 APRIL 1991
   No minutes were kept of the General Meeting held in Bloemfontein on 11 April 1991.

3. MATTERS ARISING FROM PREVIOUS COMMITTEE MEETING
   Dr C. Tilbury suggested that the General Meeting rather be held during the next symposium and not on the last day. Attendance at the past two General Meetings had been very disappointing.

4. REPORT OF THE CHAIRMAN

5. REPORT OF THE NEWSLETTER EDITOR

6. REPORT OF THE JOURNAL EDITOR

7. REPORT OF THE SECRETARY/TREASURER

8. H.A.A. MEMBERSHIP
   As indicated in Newsletter #19, the annual increase in Membership subs for African Members will be from R30,00 to R40,00, while Overseas Membership will increase from $20 to $25.

9. H.A.A. INVOLVEMENT WITH NATURE CONSERVATION DEPARTMENTS

   Dr O. Bourquin sent a note to the H.A.A. requesting its involvement with conservation bodies. Dr Bauer mentioned that H.A.A. policy will not necessarily reflect the members' views and support should occur on local level. Dr Branch reported that the Port Elizabeth Herp Club helps Cape Nature Conservation and the Port Elizabeth Museum at local level, often making significant contributions to science. Dr Baard proposed that the following statement be accepted as the H.A.A.'s stance in this matter: "The H.A.A. strongly support and encourage local involvement in Nature Conservation issues and collaboration with Conservation bodies." Proposal seconded by Dr's N.H.G. Jacobsen and W.R. Branch.

10. EDITORIAL COMMITTEE FOR THE H.A.A. JOURNAL

The Editorial Committee was requested to publish its review policy in a future newsletter or journal. Dr Baard wanted an indication as to what current abstracting scientific journals the H.A.A. Journal is listed in. Dr Branch will circulate a draft editorial policy to the Editorial Committee.

11. ACCREDITATION OF THE H.A.A. JOURNAL

Dr Branch suggested that H.A.A. members vote on whether the Journal should apply for accreditation or not. Only 27 H.A.A. members were present and as the constitution requires a quorum of 30 members, a vote could not be taken. Dr Bauer pointed out that the Journal had become more and more internationally accepted as was shown by the fact that only one of the major papers in Journal #42 was written by a South African author. Mr Haagner mentioned that all nine papers rejected over the past year were from local contributors, and several of these were subsequently published in *African Herp News*. Dr Baard mentioned that the Cape Nature Conservation journal, *Bontebok*, is available as a possible outlet for non-scientific papers. Mr Raw wanted to know whether taxonomic papers are considered as scientific publications. Dr Branch indicated that they are but this is to be decided by the Editorial Committee. Mr Farquharson explained that universities would benefit most from supporting the Journal if it was a recognized scientific publication. Mr Bates suggested that the Journal continue as it is with the Editorial Committee working towards accreditation. He asked for the members present to give an indication of how they felt about the accreditation status. Votes counted for 26, against 1. Mr Boycott suggested that husbandry papers be excluded from the Journal. Dr Branch pointed out that this would be discussed by the Editorial Committee, and that the Newsletter may serve as an alternative outlet.

12. GENERAL

12.1 NEXT H.A.A. SYMPOSIUM

Mr Blake suggested that Natal was the only province which has not yet hosted H.A.A. symposia and could possibly do so. Mr Bates offered to contact Dr Bourquin in this regard. Mr Raw suggested that it be moved to earlier in the year as October was a very difficult time for H.A.A. university members. Mr Haagner suggested that it be held in the first three months of the year, as was the first symposium in Stellenbosch. Mr Boycott wanted to know why it could not be held outside South African borders. Dr Broadley replied that he would need the support of local H.A.A. members to organize a symposium in Zimbabwe. Dr Branch offered to approach the Port Elizabeth Museum if Dr Bourquin was unable to organize a venue in Natal.

12.2 AFRICAN HERPETOFAUNAL BIODIVERSITY PROGRAMME

Mr Raw reported on the above programme of the Institute of Natural Resources at the University of Natal.

The goals are as follows:

i. To ascertain the taxonomic diversity of African reptiles and amphibians, their habitats, geographical limits and distributions, uses and conservation status.
ii. To promote an awareness of the value of these animals and their conservation.
iii. To assist in conservation research and management.
iv. To integrate conservation initiatives with sustainable development of the effected resources.
v. To promote local, national and international co-operation in the fields of research, conservation, education and sustainable utilization.

The objectives are as follows:

i. To establish a network of collaborating organizations and individuals.
ii. To co-ordinate research, management and development initiatives between collaborators.
iii. To facilitate fund-raising and allocation through a single, unified body.
iv. To establish centralized and regional information centres to enable sharing of resources and information between collaborators.
v. To provide an holistic approach to African herpetofaunal conservation research, planning and management.

Mr Raw said that he would send out a circular informing institutional members and selected herpetologists about the above programme. The meeting noted that interested individuals could contact Mr Raw to learn more about this development.

Minutes prepared by Mr G.V. Haagner, Department of Herpetology, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013, South Africa.

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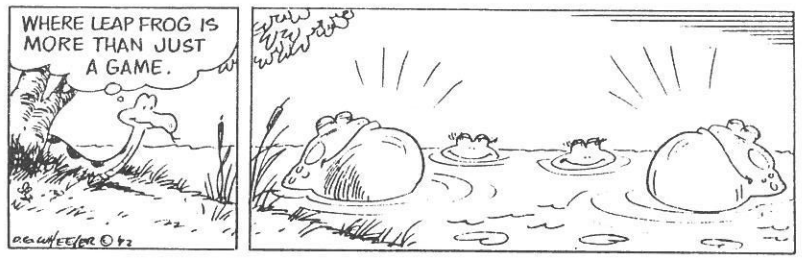
THE ADVENTURES OF SPOT



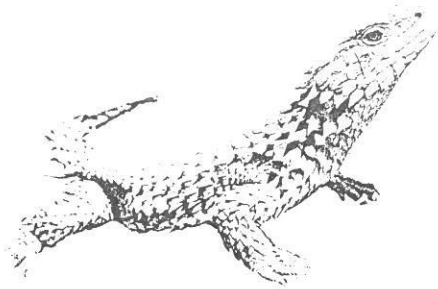
IMPORTANT NOTE TO H.A.A. MEMBERS

At the General Meeting during the *Third H.A.A. Symposium on African Herpetology*, held at the Transvaal Museum on 15 October 1993, only 27 H.A.A. members were present. This is three less than the quorum of 30 required by the H.A.A. Constitution in order to constitute an official gathering, especially in regard to voting on particular issues. The meeting was nevertheless still held, mostly for the purpose of discussing various matters important to the H.A.A. members present.

I hereby appeal to all H.A.A. members who did not attend the symposium to respond to the following two questions so that a quorum can be constituted (i.e. three more persons required to vote), even at this late stage. This is the only way the H.A.A. Committee felt it possible to resolve the matter. The second question is mainly to gauge the feeling of members regarding the accreditation issue, as the H.A.A. Committee may proceed with the matter if it feels that this is in the interest of the Association.

1. Do you agree that the following statement be accepted as the H.A.A.'s stance towards nature conservation organizations:
"The H.A.A. strongly supports and encourages local involvement in nature conservation issues and collaboration with conservation bodies."?.
Yes: ..... No: .....

2. Do you feel that it is worthwhile and in the interests of the H.A.A. journal to apply for accreditation status (listing by S.A. Department of National Education) as an approved research journal)?
Yes: ..... No: .....



MINUTES OF THE COMMITTEE MEETING HELD ON FRIDAY 15 OCTOBER 1993 AT THE TRANSVAAL MUSEUM

1. APOLOGIES
Dr O. Bourquin
Dr N.H.G. Jacobsen
Dr P. le F.N. Mouton
Mr R.C. Boycott

2. MINUTES OF PREVIOUS MEETING HELD IN BLOEMFONTEIN ON 11 APRIL 1991
The minutes were proposed by Dr E.H.W. Baard and seconded by Dr W.R. Branch.

3. MATTERS ARISING FROM PREVIOUS COMMITTEE MEETING
The only matter arising was the accreditation of the Journal.

4. JOURNAL
Mr Bates congratulated Dr Branch on the production of the Journal over the past 11 years. The possibility of Dr Mouton taking over as editor was discussed. Dr Baard reported that Dr Mouton was not negative about it and accepted the Journal as it stands, but felt that the scientific standard should be raised. Dr Branch replied that no scientific articles would be rejected out of hand and if the standard were to be raised, then he needed more quality scientific papers for publication. Mr Haacke (invited to attend the meeting) felt that a "catch 22" situation existed because of stiff competition for research funding.

Mr Bates suggested that Dr Branch contact the herpetological scientific community for quality papers in an attempt to upgrade the standard. Dr Branch suggested that the Editorial Committee look into steps to promote the acceptability of the Journal. Mr Haacke supported this proposal. Dr Baard then formally proposed Dr Mouton as the next Journal Editor. All present supported the proposal. Dr Branch said that he would send out a draft editorial policy proposal, and that the Editor would be restricted by policy. Mr Haagner suggested that the Husbandry, Venom and African Literature sections be moved to the Newsletter. The committee decided that an attempt should be made to produce at least one journal and two Newsletters per year. Dr Branch commented that sub-editors should be co-opted by the Editor who will submit suggestions to the Editorial Committee.

Mr Haagner offered to continue with the correspondence in regard to the publication of the proceedings. Dr Branch pointed out that the proceedings can only be printed once a sponsor has been found. Mr Haacke offered to approach ESCOM for possible sponsorship of the proceedings. Dr Branch pointed out that the proceedings can no longer be published as an issue of the Journal as it would not conform with the Editorial Policy applicable to regular issues of the Journal.

5. NEWSLETTER
Mr Bates was congratulated on the quality of *African Herp News* which has evolved nicely along the lines of *Herpetological Review*. Mr Haacke expressed his surprise at the quality of the Newsletter. Mr Haagner explained that several papers which were rejected from the Journal had subsequently been printed in the Newsletter.

6. MEMBERSHIP
Mr Farquharson explained that bank charges are very high (R15 per cheque) for foreign currency cheques and ideally a central co-ordinating person would be ideal for the United States of America.

7. EDITORIAL COMMITTEE
Dr Branch referred to his report during the General Meeting.

8. ACCREDITATION STATUS FOR THE H.A.A. JOURNAL
Dr Branch once again referred to his report indicating that it was up to the newly-established Editorial Committee to pursue this avenue.

9. GENERAL
Mr Haacke would send out letters thanking all the people involved in organizing the symposium.

Meeting closed at 17h23.

Minutes prepared by Mr G.V. Haagner, Department of Herpetology, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013, South Africa.

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NEW EDITORIAL POLICY FOR THE H.A.A. JOURNAL

With the appointment of an Editorial Committee, the untimely resignation of Dr Bill Branch as Journal Editor, and the decision by the H.A.A. Committee that the Journal should apply for accreditation, the format of the Journal, as well as its editorial policy, will have to change considerably.

To obtain accreditation, i.e. to be listed by the South African Department of National Education as an approved research journal, the Journal will have to meet the highest scientific standards as far as content is concerned. This will mean that a more rigorous refereeing procedure will have to be followed. In the future, referees will be selected with great care and the Editorial Committee will continuously monitor the standard of articles accepted for publication. Prospective contributors are therefore requested to take great care in preparing their manuscripts and to closely adhere to the guidelines for authors as set out below.

Henceforth all Life History notes, Geographical Distribution notes, Venoms and Snakebite notes and Herpetological Literature lists will no longer be published in the H.A.A. Journal, but rather in *African Herp News*. Short communications on any of the above topics can, however, still be submitted for publication, but will then be treated as standard articles, must meet the requirements for manuscripts as set out below, and will be sent for peer review.

By imposing higher standards, the intention is not to make the Journal inaccessible to members of the H.A.A., but to make it a more attractive scientific outlet to a broader spectrum of scientists. As it is, many South African herpetologists do not publish in the Journal because, not being accredited, research articles published here will not be considered part of the research output of the institution to which the author is affiliated. The institution, and in most cases indirectly also the researcher, is subsidized by the Department of National Education on the basis of research output. Some overseas herpetologists, on the other hand, do not consider the H.A.A. Journal a viable outlet because its international standing has yet to be established.

In the future the Journal will be published in June and December, even if this means that issues may at times be lean. The Editorial Committee feels that a more regular journal will make it even more attractive as a scientific outlet, and therefore invites all members, as well as non-members involved in herpetological research, to seriously consider the H.A.A. Journal as an outlet for their research results.

INSTRUCTIONS TO AUTHORS

General information: The *Journal of the Herpetological Association of Africa* publishes articles dealing with reptile and amphibian biology. In addition to original research papers, which form the core of the Journal, the Journal also publishes review papers, short communications, book and software reviews and meeting reports. Faunistic lists and results of general surveys are not considered unless they include a biogeographical interpretation of the data and the conclusions are of broad zoological interest.

The *Journal of the Herpetological Association of Africa* is published biannually. Contributors need not be members of the Association. There are no page fees, but authors having access to funds for payment of printing costs are encouraged to contribute to publication costs. Only English language manuscripts will be considered. All manuscripts will be reviewed by at least two referees. After acceptance of final manuscripts for publication, authors will be requested to submit their articles as ASCI files on 3.5" or 5.25" computer discs if possible. Ten offprints will be distributed free to the senior author. Additional offprints can be supplied at cost. Requests for extra offprints are to be directed to the editor when returning the corrected proof. Proofs will be sent to authors for checking of printer's errors and corrections should be limited to typographical errors.

Submission of a manuscript implies that the work has not been published before, that it is not under consideration for publication elsewhere and that its publication has been approved by all co-authors, if any.

The manuscript: Manuscripts should be submitted to the Journal Editor in triplicate. They should be typewritten, double-spaced, with wide margins on A4 paper. Words should not be divided at the right-hand margin. Genus and species names should be underlined. No footnotes are allowed. The International System of Units should be used and the use of the decimal point above the comma is requested.

Where applicable, manuscripts (including short communications) should be arranged in the following order: Abstract, main body of text, Acknowledgements, References, Appendixes, Tables, Legends to figures, Figures. The **Abstract** should not exceed 250 words. Themain body of text should consist of the following sections: Introduction, Materials and Methods, Results, and Discussion. The **Introduction** should be concise and define the scope of the study in relation to other work done in the same field, but should not give an exhaustive review of the literature. **Materials and Methods** should provide enough information to allow the study to be repeated. **Results** should be presented with clarity and precision. The **Discussion** should deal with the interpretation of the results and should not recapitulate them. It may often be advantageous to combine **Results** and **Discussion** in one section.

References should be listed in alphabetical order and should refer only to publications cited in the text. References should be in the following format:

SCHALL, J.T., AND P.R. HOULE. 1992. Malarial parasitism and home range and social status of male western fence lizards, *Sceloporus occidentalis*. J. Herpetol. 26: 74-76.

HOFF, G.L., F.L. FRYE, AND E.R. JACOBSEN. 1984. Diseases of Amphibians and Reptiles. Planum Press, New York.

BURGHARDT, G.M. 1970. Chemical perception in reptiles. Pp. 241-308. In J.W. Johnston, D.G. Moulton, and A. Turk (Eds.), Communication by Chemical Signals. Appleton-Century-Crafts, New York.

Literature citations should be in chronological order: (Jacobs 1952; Edwards & Holmes 1965; Rosen et al. 1990). When a paper with more than two authors is cited, only the

first is named in the text (Taylor et al. 1993). Cite unpublished data as e.g. Thomas (in press), which then appears in the list of references, or as H. Thomas (pers. comm.), in which case H. Thomas' name and institutional affiliation should appear under Acknowledgements.

Each table should be double-spaced and on a separate page with a legend at the top. Figures must be restricted to the minimum needed to clarify the text. Colour photographs will only be accepted if authors bear the costs. The same data should not be presented in both graph and table form. All figures and tables must be mentioned in the text. All figures are to be numbered consecutively and submitted separately. Figure legends should be listed on a separate page. The number of each figure should be marked lightly on the back in soft pencil. The figures should either match the size of the column width (8 cm) or the printing area (17 cm).

Please send manuscripts to:

The Editor: J. Herp. Assoc. Afr.
Dr P. le F.N. Mouton
J. Ellerman Museum
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University of Stellenbosch
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GUIDELINES FOR THE EVALUATION OF CANDIDATES FOR THE HERPETOLOGICAL ASSOCIATION OF AFRICA'S *EXCEPTIONAL CONTRIBUTION TO AFRICAN HERPETOLOGY* AWARD

The present Committee of the Herpetological Association of Africa has agreed upon the following guidelines for the evaluation of candidates nominated for the H.A.A. *Exceptional Contribution to African Herpetology* award. It was also agreed that these guidelines will be accepted as the standard in this regard for this and future H.A.A. Committees until such time that a Committee deems it necessary to have them altered. The emphasis is on African herpetology, and workers stationed outside of Africa should also be considered for the award. It has been decided that the award will not be presented posthumously.

1. Any number of candidates from any country may be nominated by any fully paid-up H.A.A. member by means of a written proposal accompanied by a brief motivation submitted to the Chairman of the H.A.A. Proposals to reach the Chairman at least six months in advance of an advertised symposium date.

2. The H.A.A. Chairman will then send copies of all written proposals to all Committee Members.

3. It is recommended that academic qualifications are not to be taken into account during the evaluation of candidates.

4. If in his/her or the Committee's opinion, more information is required about any particular candidate, the H.A.A. Chairman may solicit additional information from co-workers or other peer reviewers.

5. After evaluating all relevant information about the nominees, the Committee will then select by majority vote a "winner", who, as long as he/she receives more than half the Committee's votes (e.g. $^{4}/_{7}$), will then be informed formally by the H.A.A. Chairman. If there is no candidate with more than half the Committee's votes, the award will not be presented. Committee Members are not obliged to vote for any candidate if they are of the opinion that none deserve the award.

6. The H.A.A. *Exceptional Contribution to African Herpetology* award will then be conferred upon the selected candidate at an appropriate venue, which may take the form of a special ceremony during an official H.A.A. gathering (general meeting, symposium, conference or workshop).

7. Conferment of the Award is no pre-requisite for official H.A.A. gatherings such as general meetings, symposia, conferences or workshops. Therefore, if no nominations are received by the H.A.A. Chairman, an award will be made at a future venue once a candidate has been elected. It is not a necessity to present the award at any particular H.A.A. gathering.

Finally, the H.A.A. Committee expresses its hope that future committees will take cognisance of the exceptional achievements of the original recipients of this Award, and not devalue the conferment of the Award.

Compiled by: E.H.W. Baard, Additional Committee Member, H.A.A. Committee.
29 January 1992.

Amended by: M.F. Bates, Chairman, H.A.A. Committee.
30 March 1993.
19 May 1993.

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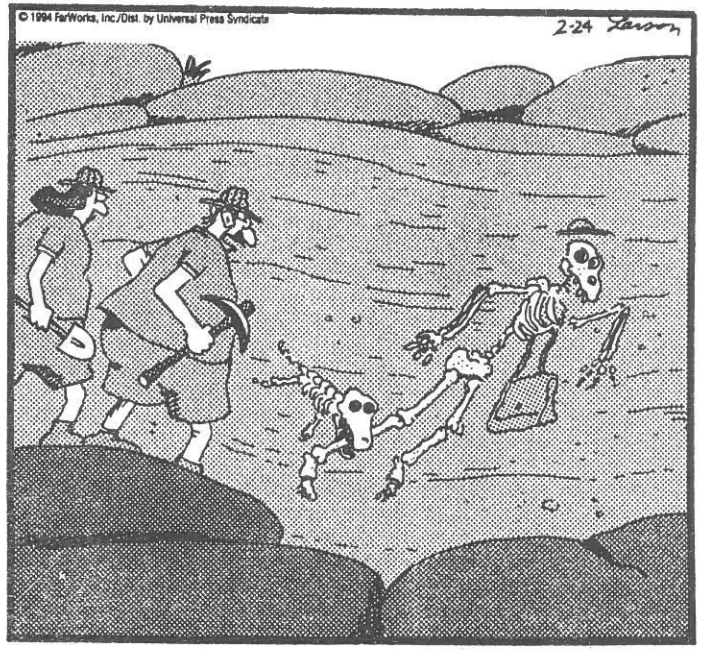

"What a find! It's mailman all right. And this specimen has his *canus nipponicus* still attached."

GROWTH OF CAPTIVE-BORN PUFF ADDERS (*BITIS ARIETANS*) DURING THEIR FIRST YEAR OF LIFE

H.M. Jauch

Zoology Department, University of Namibia
Private Bag 13301, Windhoek, Namibia

INTRODUCTION

This note deals with the growth of five captive-born *Bitis arietans*, as well as the effect of seasonal temperature differences on growth. Results will be compared with those of Coulson & Riddell (1988), who studied the growth of a Puff Adder in captivity during its first year of life.

MATERIALS AND METHODS

The study was conducted with two males and three females housed individually in small terraria (25 x 35 x 38 cm). No artificial light or heat was provided. House mice (*Mus musculus*) were offered every 2-3 weeks, their mass being determined before being fed to the snakes. Weekly surface temperature readings were taken within the terraria. Snakes were measured and weighed at ten week intervals over a period of one year (1 April 1992 - 1 April 1993).

RESULTS AND DISCUSSION

For every 10 g of food consumed, the average increase in body mass was 5,78 g (range: 5,4-6,9 g) and the average increase in length was 22,1 mm (range: 19,5-25,0 mm). Mass and length did not increase proportionately (Table 1). One male increased in mass by 142,79 g and in length by 220 mm, while the other increased by only 115,51 g and 250 mm. The female with the greatest mass increase (120,27 g) showed the smallest increase in length (i.e. 195 mm compared to 220 mm for the other two females). The latter two females increased in mass by 114,43 g and 107,91 g respectively. The relationship between mass and length increase is reflected in Fig. 1.

Temperature in terraria varied from 16-30°C during the year. Comparison of growth between the hottest (December, January: 26-30°C) and coldest (June, July: 16-20°C) months indicates a small difference in mass increase. During the hottest months the snakes increased in mass by an average of 5,58 g (range: 4,4-6,1 g) for every 10 g of food consumed compared to an average of 5,92 g (range: 3,8-8,5 g) in the coldest months. However, there was a more dramatic seasonal difference in length increase. During the hottest months the snakes grew by an average of 11,55 mm (range: 9,73-13,56 mm) for every 10 g of food consumed, compared to an average of 5,34 mm (range: 2,43 - 7,32 mm) during the coldest months.

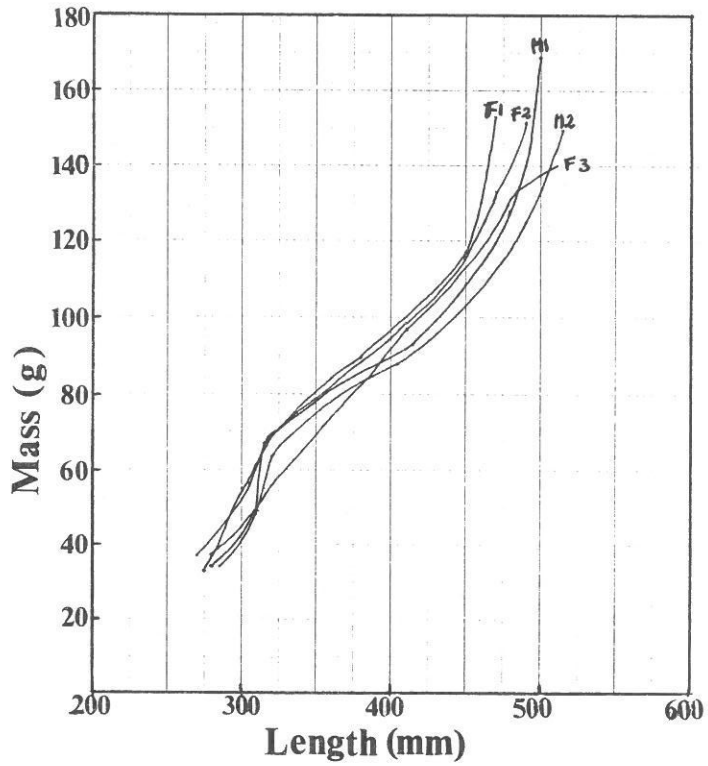

Figure 1: Correlation between mass and length increase in captive *Bitis arietans* during their first year of life (M1 = Male 1, M2 = Male 2, F1 = Female 1, F2 = Female 2, F3 = Female 3).

Table 1: Size and mass increments of new-born *Bitis arietans* over a period of one year (1 April 1992 - 30 March 1993).

SEX	INITIAL MASS AND LENGTH	TOTAL CONSUMP-TION	INCREASE IN MASS AND LENGTH	
Male 1	34,9 g 280 mm	206,87 g	142,79 g	220 mm
Male 2	34,1 g 285 mm	213,67 g	115,51 g	250 mm
Female 1	32,6 g 275 mm	206,16 g	120,27 g	195 mm
Female 2	37 g 270 mm	210,30 g	114,43 g	220 mm
Female 3	32,1 g 280 mm	198,79 g	107,91 g	220 mm

Table 2: Relationship between daily consumption rate and daily growth rate of new-born *Bitis arietans* over a period of one year (1 April 1992 - 30 March 1993).

SEX	CONSUMPTION (g/day)	GROWTH RATE	
		Mass (g/day)	Length (mm/day)
Male 1	0,57	0,39	0,60
Male 2	0,58	0,32	0,68
Female 1	0,56	0,33	0,53
Female 2	0,58	0,31	0,60
Female 3	0,54	0,29	0,60

A comparison between the daily consumption rate and the daily growth rate over the period of the study indicates considerable consistency in growth rate (Table 2). The ratio between daily consumption and increase in length was as follows:

Male 1 : 1,05
Male 2 : 1,17
Female 1 : 0,95
Female 2 : 1,03
Female 3 : 1,11

This means that for every gram of food consumed, M1 (Male 1) increased its length by 1,05 mm, M2 by 1,17 mm, etc. These results are similar to those of Coulson & Riddell (1988). Their Puff Adder showed a ratio of 1,0, increasing in length by 1 mm for every gram of food consumed.

Coulson & Riddell (1988) also reported that their Puff Adder sloughed every time its weight was doubled during its first year of life. The specimens in the present study did not, however, conform to this pattern. M1, M2, F2 and F3 sloughed three times, while F1, which exhibited the slightest increase in length (195 mm), sloughed only twice.

CONCLUSION

As shown in previous studies (Jacobsen, 1986; Coulson & Riddell, 1988), Puff Adders grow rapidly in their first year of life. The five specimens used in the present study showed considerable consistency in growth rate, confirming the ratio between daily consumption and growth rate as established by Coulson & Riddell (1988).

The present study also indicates that seasonal temperature differences in the range of 16-30°C have little effect on mass increase. These seasonal differences did, however, have a dramatic effect on the snakes' increase in length.

ACKNOWLEDGEMENTS

I wish to thank Dr Neil Heideman for assistance in the drafting of this paper. I am also grateful to the Ministry of Wildlife, Conservation and Tourism for granting the necessary permit.

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RESEARCH ON SNAKEBITE AT THE SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH

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The South African Institute for Medical Research (SAIMR) has for the past 50 years produced refined horse antiserum (immunoglobulins) to neutralize scorpion, spider and snake venoms, as well as diphtheria and tetanus toxins.

Horses follow an intensive immunization schedule and the antiserum is processed and purified. Throughout the antiserum processing, quality control tests are carried out on the antiserum. These tests, known as immunodiffusion and immunobinding assays, test the quality and quantity of antivenom antibodies in equine antiserum.

The Research and Development (R&D) department of the SAIMR Serum and Vaccine unit are conducting a research project to identify the type of snake involved in a snakebite case. Immunodiffusion and immunobinding assays have been adapted to test the victim's serum for the presence of antibodies to snake venom. These tests, however, can only be carried out on a patient's serum after at least 14 to 21 days, which is the time the body takes to produce anti-venom antibodies. Several cases have already been studied, and antivenom antibodies have been identified from one month to eight months after the snakebite occurred.

A second project carried out by the R&D department is to identify circulating snake venom in a snakebite victim's blood. A sample of the patient's blood taken soon after the bite may contain venom which can then be identified with specific antibodies. Monovalent antibodies are being produced against a cobra species, mamba species, adder species and the rinkals. Similar research has been successful in Australia.

The aim of these research projects is to assist in the clinical diagnosis and treatment of snakebite victims, but to further these studies, more serum samples are required. **Dr. Southern and Miss L. Spenceley of the SAIMR would appreciate any interest in this research.**

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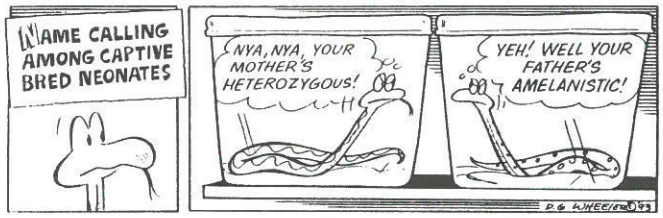
THE ADVENTURES OF SPOT



DIAPHRAGMATIC HERNIA IN A NILE CROCODILE HATCHLING

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While crocodiles do not have a diaphragm in the sense of mammalian anatomy, their peritoneal cavity is separated from the two pleural cavities by a complete post-hepatic transverse membrane and an incomplete pre-hepatic transverse membrane, both of which are connected to the ventral *musculus diaphragmaticus* by which means they play a role in respiration similar to the mammalian diaphragm. Their presence also prevents the mixing of abdominal and thoracic organs.

A dead 3-months-old Nile Crocodile (*Crocodylus niloticus*) hatchling was submitted by a crocodile farmer. At post mortem examination it was found to have a large white mass apically in the right thoracic cavity compressing the right lung and shifting the heart somewhat to the left side (Fig. 1). On dissection this was found to be a large, inflamed, non-absorbed yolk sac attached to the intestine at the duodeno-jejunal junction, its normal place of attachment. Histopathological examination confirmed the structure to be the yolk sac, to which compressed lung tissue remained attached (Fig. 2).

On the farm in question there was a high incidence of inflamed non-resorbed yolk sacs either due to navel infection at hatching or to infection via the intestine. It is most likely that an attendant inadvertently stepped on this crocodile while cleaning the dimly lit rearing house. This would have caused an increase in abdominal pressure leading to the rupture of both transverse membranes on the right side, the left side being blocked by the stomach. From there, yolk sac and intestine were propelled into the right pleural cavity. Even the fat body was drawn forward in the process and came to lie between the right lobe of the liver and the body wall (Fig. 1).

The non-muscular nature of the ruptured membranes would have prevented the strangulating effect commonly seen in mammalian diaphragmatic hernias. The animal is presumed to have died from the combined effects of respiratory inhibition and toxins generated by the chronic infection of the yolk sac.

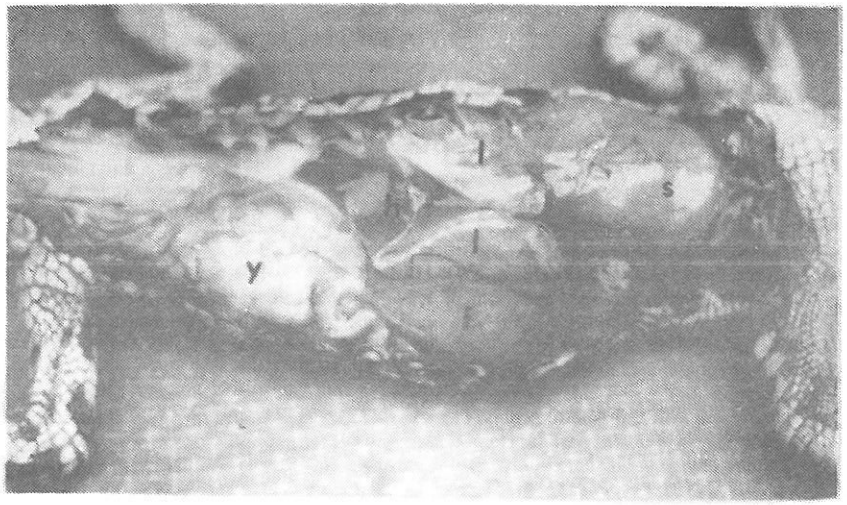

Figure 1: Diaphragmatic hernia in a Nile Crocodile hatchling (internal anatomy - y: yolk sac; l: liver; h: heart; s: stomach; f: fat body).

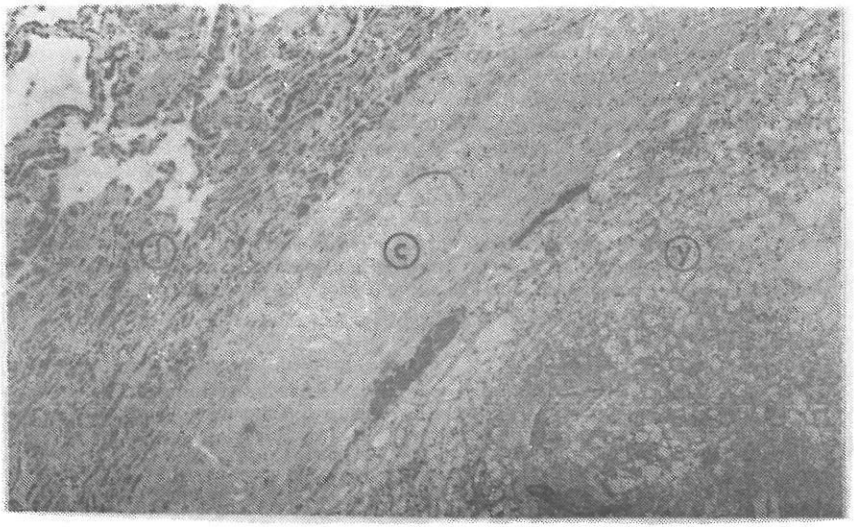

Figure 2: Diaphragmatic hernia in a Nile Crocodile hatchling (histopathology - l: compressed lung tissue; c: thickened yolk sac capsule; y: inflamed yolk sac tissue).

IDENTIFICATION KEY TO THE FROGS OF THE ORANGE FREE STATE

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The status and distribution of amphibians in the Orange Free State (O.F.S.) was studied by De Waal (1980) who recorded 22 species and subspecies from the province. Since then additional collecting has been conducted and three additional taxa have been recorded from the region, namely *Heleophryne natalensis*, *Breviceps maculatus* and *Tomopterna natalensis* (Bates, 1992). Lambiris' (1991) record of *Pyxicephalus adspersus edulis* from Bloemfontein is dubious and probably referable to the nominate subspecies, but *edulis* has been included in the key for the purposes of inclusivenous. Identifying characters for *edulis* were taken from Poynton & Broadley (1985) and Lambiris (1989).

While updating distribution records for the O.F.S., Bates (1992) examined virtually all preserved O.F.S. amphibians in southern African museum collections. This made it possible to compile a diagnostic key for the identification of post-metamorphic amphibians known to occur in the O.F.S. The key is based on the criteria used by Poynton (1964), Passmore & Carruthers (1979) and Lambiris (1989) for distinguishing between the different taxa. The number of specimens of each taxon examined is indicated in parenthesis in the key. Features of the tongue and teeth were examined from some, but not all, specimens. Head width/snout-urostyle length ratios for *Pyxicephalus adspersus* were taken from Poynton & Broadley (1985), while head width/tibia length ratios for *Rana angolensis* and *R. fuscigula* are from Lambiris (1989).

1a. Tongue absent; inner three toes with black claws (n = 161) ..... **Xenopus laevis laevis**
b. Tongue present; toes without claws 2

2a. Tongue discoidal, not free behind; tips of fingers and toes expanded and spatulate (n = 3) ..... **Heleophryne natalensis**
b. Tongue not discoidal, free behind; tips of fingers and toes not expanded 3

3a. Tibia length less than half the length from snout-to-vent 4
b. Tibia length greater than half the length from snout-to-vent 8

4a. Inner metatarsal tubercle massive and flanged; snout short with small, down-turned mouth 5
b. Inner metatarsal tubercle poorly developed: snout regular with wide, horizontal mouth 7

5a. 5th toe extending well beyond basal tubercle of 4th toe; a broad, pale median band present on back (n = 1) ..... **Breviceps maculatus**

b. 5th toe minute, not reaching basal tubercle of 4th toe; pale paravertebral blotches on back present or absent 6

6a. Chest and abdomen usually immaculate white to cream; max. snout-vent length in O.F.S. = 44 mm (n = 8) ..... **Breviceps adspersus adspersus**
b. Chest and abdomen usually with dark flecks; max. snout-vent length in O.F.S. = 23 mm (n = 1) ..... **Breviceps adspersus pentheri**

7a. Dorsal pattern of three dark longitudinal stripes, the dorso-lateral ones often broken, on a yellow to tan background; gular disc in male is longitudinally oval (n = 236) ..... **Kassina senegalensis**
b. Dorsal pattern of three dark longitudinal stripes, usually divided longitudinally with the dorso-lateral stripes not broken and diverging posteriorly, on a tan background; gular disc in male is transversely oval (n = 96) ..... **Semnodactylus wealii**

8a. Lower jaw with three conspicuous bony cusps, the outer two being distinctly longer than wide and very prominent in large specimens 9
b. Lower jaw without conspicuous bony cusps, although there may be minute serrations or a small median projection 10

9a. Dorsal surface uniformly olive-green in adults (ill-defined patches present in juveniles); no inter-orbital bar present; no clear pattern on upper jaw, or if present, blurred by light stippling; head width usually more than 49% snout-urostyle length (n = 1021) ..... **Pyxicephalus adspersus adspersus**
b. Dorsal surface mottled or blotched; inter-orbital bar represented by light cross and/or dark inter-orbital bar posteriorly; a series of 2-3 dark marks on upper jaw alternating with light areas, both of which may border the eye; head width usually 41-49% snout-urostyle length ..... **Pyxicephalus adspersus edulis**

10a. Toes without webbing 11
b. Toes webbed (at least at the base) 13

11a. Ventral pattern of diffuse dark mottles or stipples (n = 4) ..... **Arthroleptella hewitti**
b. Ventral pattern of dark spots or patches 12

12a. Palmar tubercles smaller than tubercles of fingers; variable number of dark spots or patches scattered over chest and abdomen (occasionally absent, especially in froglets); usually few or no markings on throat (n = 1190) ..... **Cacosternum boettgeri**
b. Palmer tubercles larger than tubercles of fingers; dark markings concentrated on chest and throat, often absent on belly (n = 3) ..... **Cacosternum nanum**

13a. Skin on belly granular; dorsal skin rough and dry in appearance with numerous elevations 14
b. Skin on belly smooth 19

14a. Parotid glands suppressed, not visible externally; tarsal fold present or absent 15
b. Parotid glands conspicuous; tarsal fold present 16

15a. Tarsal fold present; a pair of dark spots in the sacral region on a reddish-brown back; a conspicuous glandular line runs dorso-laterally; numerous grey flecks on belly (n = 21) ..... **Schismaderma carens**
b. Tarsal fold absent; dorsum with large dark markings usually symmetrical about the midline; several clear black spots on belly (n = 41) ..... **Bufo vertebralis**

16a. Dorsum with assymetrical dark patches on a tan ground colour; belly of young specimens with numerous black spots (n = 206) ..... **Bufo gariepensis gariepensis**
b. Dorsum with fewer dark markings, usually arranged roughly symmetrically about the midline; belly without dark markings 17

17a. Light cross on top of head formed between a pair of dark patches on the snout and a dark inter-ocular bar which is interrupted medially (n = 26) ..... **Bufo gutturalis**
b. No light cross on top of head; a single dark asymmetrical dot may be present at the tip of the snout 18

18a. Dark inter-ocular bar completely divided medially; red to scarlet infusions present on upper part of thigh; inter-digital webbing scanty (n = 28) ..... **Bufo poweri**
b. Dark inter-ocular bar usually undivided (but medially constricted or narrowly divided in about 30% of specimens); no red or scarlet infusions on thigh; inter-digital webbing conspicuous (n = 251) ..... **Bufo rangeri**

19a. Inner metatarsal tubercle large and flanged 20
b. Inner metatarsal tubercle not flanged and usually small 21

20a. Not more than 2 phalanges of 3rd toe, and not more than 3½ phalanges of 4th toe, free of webbing; a pale vertebral stripe, or vertebral and dorso-lateral stripes, and light occipital patch, often present; no small black inguinal patches (n = 497) ..... **Tomopterna cryptotis**
b. 2 to $2^3/4$ phalanges of 3rd toe and 3½ to $3^3/4$ phalanges of 4th toe free of webbing; no pale vertebral or dorso-lateral stripes present; a few small black inguinal patches always present (n = 8) ..... **Tomopterna natalensis**

21a. A white tubercle present about midway on tarsus; inner and often outer metatarsal tubercles also present; vomerine teeth absent; a small papilla present on middle of tongue (n = 16) ..... **Phrynobatrachus natalensis**
b. No tubercle midway on tarsus; only one metatarsal tubercle present (either inner or outer); vomerine teeth present; no median papilla on tongue 24

22a. 1-3 phalanges of 4th toe free of webbing 23
b. 3-4 phalanges of 4th toe free of webbing 25

23a. Dorsum olive-brown to green with rather regularly-arranged dark spots about the size of the eye; pale vertebral stripe often present; usually 1-2 phalanges of 4th toe free of webbing 24

b. Dorsum brown to grey with less regular, rather marbled, dark patches; no pale vertebral stripe; 2-3 phalanges of 4th toe free of webbing (n = 20)..... ..... **Strongylopus hymenopus**

24a. Usually 1 phalanx of 4th toe free of webbing; width of head 66-85% tibia length; throat and belly often extensively mottled, especially in large specimens (n = 184) ..... **Rana fuscigula**

b. Usually 1½-2 phalanges of 4th toe free of web; width of head 42-62% tibia length; throat, and more usually belly, often without markings or less extensively marked than in 24a (n = 148) ..... **Rana angolensis**

25a. Dorsum yellow to buff with dark paravertebral stripes and dark oblique dorso-lateral stripes; lower leg striped longitudinally; 3½ phalanges of 4th toe free of webbing (n = 6) ..... **Strongylopus fasciatus fasciatus**

b. Dorsum grey with dark spots and blotches; a thin, pale vertebral stripe usually present; lower leg barred; 3^3/4-4 phalanges of 4th toe free of webbing (n = 26) ..... **Strongylopus grayii grayii**

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REPRINTS

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WORM SNAKES FOUND IN COW DUNG

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The snake family Leptotyphlopidae contains the genera *Leptotyphlops* (about 60 species) and *Rhinoleptus* (1 species), commonly known as worm or thread snakes. These small snakes are blackish in colour, smooth-scaled and rather worm-like in appearance. They are elusive and fossorial, and usually seen above ground only after heavy rains flood them from their burrows or retreats. The typical microhabitat of southern African forms is under stones or rotting logs, in grass roots or in disused termite mounts (De Waal 1978; Broadley 1983). In these situations, termites and other small insects are often found, some of which form part of the diet of these snakes (Broadley 1983).

On the 16th April 1984, while collecting insects in an open grassland area on the farm Frazer Spruit in the Harrismith district, northeastern Orange Free State (2829AC), five specimens of Peters' Worm Snake *Leptotyphlops s. scutifrons* (Peters) were collected. These specimens were collected by J.H. van Wyk and R.M. Douglas, and are preserved in the collection of the National Museum, Bloemfontein (NMB R5245-5249). One was found under a stone, whereas the other four were found inside moist, partly-decomposed cow dung. To the author's knowledge, this is the first record of a snake species actively utilizing mammal faeces as part of its habitat.

Although the snakes may have utilized the dung as a temporary shelter only, as it is warm with a fairly stable miroclimate (before disintegration), this is unlikely in view of the dense population of actively moving dung fauna. The snakes may well have been attracted by the proliferation of dung fauna (including potential prey) evident in such faeces. Because dung hardens and disintegrates with time as a result of evaporation and decomposition, or is fragmented due to removal of material by dung beetles, this microhabitat could represent only a temporary food niche. The high densities of detritivorous and other invertebrates in decomposing dung may represent a food source opportunistically utilized by local worm snakes.

The extent to which worm snakes are associated with mammal faeces (e.g. elephant dung) would make for an interesting study.

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WORM LIZARD INSIDE COW?

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Shortly after reading Bates' (1990, *Mirafra* 7(3): 68-69) note on some Peter's Worm Snakes *Leptotyphlops s. scutifrons* found in cow dung in the Harrismith District, I came across the following account by R. Bigalke (1920, *South African Journal of Natural History* 2(2): 284) of a rather more bizarre reptile-cow interaction:

"On June 4th, 1920, Mr J. Forsyth of the Experimental Farm, Glen [now Glen Agricultural College, Bloemfontein District], brought me a specimen of what appeared to be a blind snake, and stated that he was present and actually saw the animal being voided with the excretement of the pedigree South Devon Cow D O A 48. The specimen was sent to the Museum at Kimberley, where Mr J.H. Power kindly identified it and declared it to be *Monopeltis capensis*, a legless lizard of the family Amphisbaenidae. Except for the head, which was damaged, the animal was intact. How it came into the digestive system of the cow can only be surmised, especially since the lizard lives underground, and it seems remarkable that the animal should have travelled the whole length of the cow's intestines (which according to Hering are about 150 feet long) without having been injured more than was actually the case."

M. capensis, or the Cape Spade-snouted Worm Lizard, is "very common in suitable habitat. It burrows in red soils and feeds on termites, beetle larvae, etc." (Branch 1988, *Bill Branch's field guide to the snakes and other reptiles of southern Africa*). I leave readers to decide on how a cow could have ingested one of these lizards, and then void it undigested, with an observer present to witness the final act. (It has been suggested to me that the lizard may have gained entry from the other end, when the cow was lying down!)

Editor's note: Perhaps some of our readers have observations to offer regarding reptiles utilizing animal dung as microhabitat, or how the amphisbaenian managed its feat with the cow!?

In the Annual Report on the Herpetological Collection of A.J.L. Lambiris (1988) (*Ann. Rep. Lambiris Herp. Coll.* 8(1): 23; 1988) the author notes that a puddle frog *Phrynobatrachus mababiensis*, collected at the edge of a small, dry pan along the Zambezi River in Zimbabwe, was found "in an elephant scat, dry on the outside but moist inside".

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FROM THE PRESS:

BOER TREK POFADDER UIT SEE, WORD IN TOON GEPIK

(*Die Volksblad*, 29 December 1993)

KAAPSTAD. - 'n Pofadder het 'n boer in die Kerstyd by Uilenskraalmond aan die toon gebyt terwyl hy in die branders harders uitgetrek het.
Mnr. Kobus de Wet van die plaas Modderlaagte by Uilenskraalmond het gister vertel van sy noue ontkoming toe die pofadder - "so lank soos my arm en so worm-lizard dik soos my voorarm"- net vóór die Kersfees in sy net beland het.
Hulle het omtrent heuphoogte in die branders naby die mond gestaan toe hy "'n lang ding" in die net sien lê.
Hy het hom nie veel daaraan gesteur nie en die net strand toe getrek.
"Toe ons klaar net oopgegooi en die harders uitgelê het, het ek iets in die sand sien lê wat gelyk het soos 'n paar harders langs mekaar."
Uit nuuskierigheid het hy met sy voet daarna geskop.
"Dis toe wat ta reguit trek en blaas. Ek het vinnig die net se een stok kaalgemaak en hom 'n paar lekker houe gegee. 'n Mens verwag mos nou nie só iets wanneer jy vistrek nie."
Eers toe hy by die huis kom en 'n klein gaatjie naby sy toonnael gewaar, het hy besef hy is raak gepik. Hy vermoed dat hy moontlik die slang se tand raakgeskop het.
Hoewel hy doktersbehandeling ontvang het, het hy eers die volgende oggend duiselig geraak en ligte simptome van vergiftiging ervaar. Die dokter het ook die slang as 'n pofadder geëien.
Hoewel hy al 25 jaar vistrek en "al palings en mensvreterhaaitjies gevang het, het hy nog nooit vantevore só iets teëgekom nie".
Volgens mnr. Brian Vorster, 'n slangkenner van Kaapstad, het hy nog nooit gehoor van 'n pofadder wat in die see swem nie. Pofadders blaas hulle gewoonlik soos 'n ballon op en dryf op die water.
Dié tyd van die jaar kry 'n mens egter seeslange wat weens die warmte met die Mosambiekstroom afgespoel word. Hulle is swart met geel pense en plat soos palings. Die publiek verwar hulle dikwels met palings, wat tot ernstige gevolge kan lei.

Submitted by: Ms L. de Villiers, Librarian, National Museum, P.O. Box 266, Bloemfontein 9300, South Africa.

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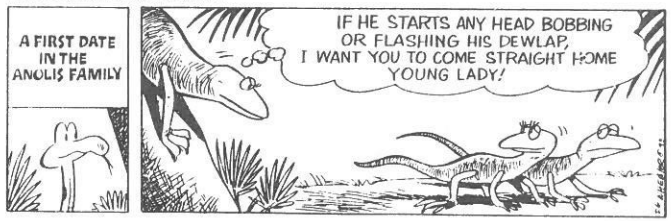

VROU LAAT SLANG 'WELKOM' VOEL

(*Die Volksblad*, 8 January 1994)

COLESBERG. - Slange is vir die meeste mense maar grillerige goed. 'n Vrou van die dorp het egter besluit om die slang waarop sy byna getrap het, goed te behandel.
Die adder het op 'n trappie teen die rantjie by mnr. Charles en mev. Anetta Westoby se huis in Ventershoekstraat gelê toe mev. Westoby byna op hom getrap het.
Sy het 'n eier uit haar yskas in water opgewarm en dit toe digby die slang gaan neersit.
Terwyl sy en haar man die slang op 'n afstand dopgehou het, het hy sy klein bekkie gerek en gerek en die eier gesluk, waarna hy hom luilekker onder 'n struik opgekrul het.
Die egpaar, wat voorheen in Johannesburg gewoon het en hier kom aftree het, is groot diereliefhebbers. Mev. Westoby is 'n kunstenaar en een van haar liefhebberye is om ou porseleinware te herstel.

Submitted by: Ms L. de Villiers, Librarian, National Museum, P.O. Box 266, Bloemfontein 9300, South Africa.

Editor's note: Although the snake in this report is referred to as an "adder", all indications are that it is a Rhombic Egg-eater, *Dasypeltis scabra.*

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HOME FOR CITY'S SNAKES

(*The Star,* 15 September 1993, p. 4)

WINNIPEG. - The Canadian prairie city of Winnipeg has opened a home for stray snakes to head off an escalating surfeit of serpents in city sewers.

Submitted by: Mr E. du Pisani, Department of Anthropology, National Museum, P.O. Box 266, Bloemfontein 9300, South Africa.

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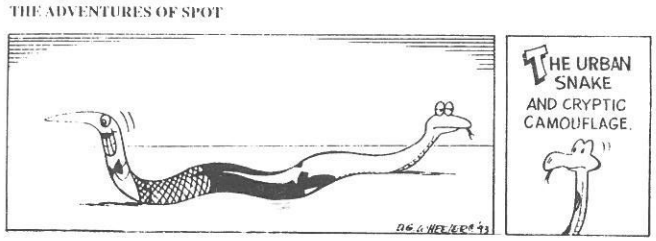

RINKHALS BYT VROU VAN BLOEMFONTEIN 2 KEER

(*Die Volksblad,* 13 January 1994)

Hanáni Pienaar

'n Huisvrou van 'n hoewe buite Bloemfontein het gister 'n noue ontkoming gehad toe 'n rinkhals haar twee keer in haar regteronderbeen gebyt het.
Mev. Grietha Venter vertel sy het die rinkhals in 'n buitekamer gesien, maar nie besef hy het haar gebyt nie. Omdat sy vir die slang geskrik het, het sy in die huis gegaan en haar man, Roelf, by sy werk gebel.
Sy het begin vermoed dat die slang haar wel gebyt het toe sy bloed aan haar been sien.
Sy het haar man vertel sy dink die slang het haar gebyt.
Mnr. Venter het huis toe gery om sy vrou na 'n dokter te bring. Intussen het een van die werkers op die hoewe die slang in pakkamer gesoek en doodgemaak.
Mnr. Venter het toe sy vrou en die dooie slang na 'n dokter in Bloemfontein gebring.
Sy is uiteindelik in die noodgevalle-afdeling van die Hydromed-hospitaal opgeneem.
Nadat behandeling daar begin is, is sy na die hoësorgeenheid van die hospitaal oorgeplaas. Mev. Venter het onder meer anti-serum binne-aars ontvang. 'n Bloemfonteinse dokter wat in giftige byte belangstel, behandel haar.
Dié dokter, wie se naam om etiese redes nie genoem mag word nie, sê die rinkhals se gif tas die weefsel én die senustelsel aan. Die aantasting wissel van gevaarlik tot lewensgevaarlik. Gewoonlik swel 'n gebyte ledemaat en word meer ernstige senuweesimptome soos moeilike asemhaling, probleme met sluk, spraak en gesig ondervind.
Hy sê 'n rinkhals kan ook spoeg, en dit is gevaarlik as sy gif in 'n mens se oë beland.

Submitted by: Ms L. de Villiers, Librarian, National Museum, P.O. Box 266, Bloemfontein 9300, South Africa.

Editor's note: A colour photograph of the snake was also printed in this newspaper, showing it to be undoubtedly a "speckled" Rinkhals, *Hemachatus haemachatus.* According to the photo caption, the snake measured 72 cm in length.

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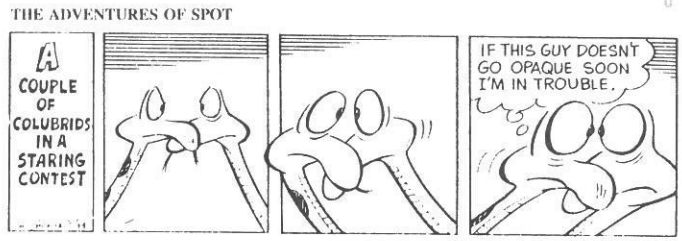

HERPETOLOGICAL BOOKS

Just released! A new reference in herpetology

ENDOGLYPHS AND OTHER MAJOR VENOMOUS SNAKES OF THE WORLD. A CHECKLIST

by P. Golay, H.M. Smith, D.G. Broadley, J.R. Dixon, C. McCarthy, J.C. Rage, B. Schätti, M. Toriba

Regular edition 1993, 496 pp., 148 x 210 mm, clothbound **75.-SwissFrancs** (approx. 50u) (ISBN 2-00-2). Patron's edition, 496 pp., 148 x 210 mm, leatherbound, numbered (120 copies) **150.-SwissFrancs** (ISBN 2-940077-01-0)

The scope of this book is restricted to endoglyphs (venomous snakes with a closed groove in the fang) and medically significant ectoglyphs (venomous snakes with an open groove in the fang). This work is essential reading for naturalists, herpetologists, medical or biomedical researchers and physicians; it should be present in every hospital, natural history museum/society, research laboratory, university and zoo reference library.

Features

* Catalogue of the potentially dangerous snakes of the world
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by Er-mi Zhao and Kraig Adler

China, with 661 species of amphibians and reptiles in 164 genera and 34 families, possesses one of the largest and most diverse herpetofaunas of any country, and it occupies a strategic geographic position, as it bridges the Oriental and Palaearctic biogeographic zones. Despite the size and relative importance of China's herpetofauna, however, there is no existing work - in Chinese or in any other language - that comprehensively reviews all recognized species, until now.

The purpose of this new, 500-page book, written in English by Er-mi Zhao (Chengdu Institute of Biology) and Kraig Adler (Cornell University), is to summarize the current taxonomic status and distribution of all Chinese species. The geographic coverage includes all of mainland China, plus Macao, Hong Kong, Hainan, and Taiwan.

Table of Contents
History of Herpetological Studies in China.
Illustrated Keys to Chinese Amphibians and Reptiles.
Annotated Checklist of Genera, Species, and Subspecies (including synonymies).
Distribution of Chinese Amphibians and Reptiles (including charts of distribution by province).
Annotated Bibliography (containing 1825 references).
Appendices (gazetteer of localities; collecting and preserving techniques; Chinese herpetological journals).
Indices to Names of Authors and to Scientific Names.

The book contains **48 colour plates** (371 individual photographs of animals and habitats), *including all genera and 330 species*. Due to the high cost of producing extensively colour-illustrated works, this book will be issued in a relatively small edition, a significant part of which is destined for scientists and libraries in China and East Asia.

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THE INADEQUATE ENVIRONMENT

T.C.R. White

University of Australia, Glen Osmond, South Australia

Nitrogen and the abundance of animals
1993. XIX, 425 pp. 41 figs. Hardcover DM 68,- ISBN 3-540-56828-X

Ecology is characterized by the rapidly growing complexity and diversity of facts, aspects, examples and observations. Sorely needed is the development of common patterns, rules, that, like in other sciences such as physics, can explain the increasing complexity and variability we observe in more general terms. One commonly held opinion is that the competition for energy is the most important factor in ecological interactions. Tom White, one of the "seniors" in ecology, disagrees and has collected in his book numerous examples from the entire animal kingdom that show and explain a different pattern: the universal hunger for nitrogen as the misery that drives the ecology of all organisms. He believes that the awareness of this fundamental role that the limitation of nitrogen plays in the ecology of all organisms should be as much a part of each ecologist's intellectual equipment as is the awareness of the fact of evolution by means of natural selection. His claim is that not "'energy" but "nitrogen" is the most limited "currency" in the animal world for the production and growth of their young.

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RECENT HERPETOLOGICAL BOOKS

Part 2

All books reviewed by **Bill Branch**

Port Elizabeth Museum, P.O. Box 13147, Humewood 6013, South Africa

Below are brief reviews of some recent herpetological books from around the world. Hopefully they may aid members in building a useful herpetological library. Some publishers offer discounts, and H.A.A. members ordering books should enquire whether such a saving is available.

This is the second and final part in the series of reviews on recent herpetological books.

NORTH AMERICA

Amphibians and Reptiles in West Virginia
N. Baynard Green and Thomas K. Pauley, 1987. xi + 241 pp., 27 col. pls. University of Pittsburgh Press (127 N Bellefield Avenue, Pittsburg, Pa. 15260, U.S.A.), US $29.95 plus postage, hardcover; $14.95 plus postage, softcover.

State field guides abound in the U.S.A. (I am aware of three that have appeared in the last few years for Texas alone). Even the relatively depauperate (herpetologically speaking) states of Alaska and Hawai have detailed field guides. My own favourite is James Lazell's *This Broken Archipelago* (Cape Cod and the Islands, 1976), for both its excellent black and white photography and articulate 'bloodyminded' text. This is closely followed by the *Amphibians and Reptiles of the Carolinas and Virginia* by Bernard Martof and his colleagues (1980), although this time for the phenomenal quality of the colour pictures (by Jack Dermid).

This new guide is the first for West Virginia. I am in no position to judge the accuracy of its coverage for the State, but I can admire the excellence of the layout, the superb taxonomic keys, and the simple, but thorough text. Each species account is divided into sections on Description, Habitat and habits, Breeding, Remarks and Range, and information is fully acknowledged by citation. The review's depth is attested by the length of the bibliography: 37 pages long with approximately 700 references. My only dislike is the quality of the cover, which I feel is too soft to withstand regular use.

What may surprise African herpetologists is the very different composition of the herpetofauna. Of the 85 species covered by the guide, no less than 28 are salamanders, 14 are frogs and toads, 15 are turtles (we would call them terrapins), 22 are snakes and only 5 are lizards. Of the 44 genera, only five (*Bufo, Rana, Trionyx, Eumeces* and *Coluber*) are also found in Africa, and the only species we share is the introduced Red-eared terrapin (*Trachemys scripta*). It thus has limited practical applicability in Africa. Nonetheless, I recommend it as a good example of its genre.

A Field Guide to the Reptiles of Oklahoma
Gregory and Lynnette Sievert, 1988. 96 pp. full colour booklet. Department of Conservation, 1801 N. Lincoln, Oklahoma City, OK 73105, U.S.A.), US $4.00 + 1.00 postage, softcover.

This well-illustrated, small booklet introduces the reptiles of the State. Each major group has a short introduction, followed by individual species accounts (one per page for the 16 turtles, 17 lizards and 44 snake species). These include size, appearance, similar species and natural history. A colour photograph (that together range from good to excellent) and a state distribution map accompany each account.

The cost of the publication is met from the Oklahoma Nongame Wildlife Program (NWP). State taxpayers, due for a state tax refund, are invited to donate a small amount to the NWP. This goes towards conservation programs for the State's wildlife, and is deductible from federal taxes. It is a sensible adjunct to wildlife funds and one that could possibly be applied in South Africa.

A Guide to the Identification of the Amphibians and Reptiles of Hispaniola
Robert W. Henderson and Albert Schwartz, 1984. 76 pp. Milwaukee Public Museums Publications. $ 6.95, softcover.

and

A Guide to the Identification of the Amphibians and Reptiles of the West Indies, exclusive of Hispaniola
Albert Schwartz and Robert W. Henderson, 1985. 176 pp. Milwaukee Public Museums Publications. $29.95, softcover.

It seems sensible to consider these two publications together and, indeed, it is not obvious why they were not intergrated into a single publication. Both works are identical in treatment, with the single exception that the smaller text on Hispaniola lists the distribution of species by biogeographic region on the island, whilst the larger work simply lists the presence of species on islands. Furthermore, the West Indies guide includes, among the 168 taxa illustrated, 18 *Anolis* and *Chamaelinorops* from Hispaniola! Unnecessary duplication occurs in the bibliographies, where nearly 40% of the references included in the Hispaniola guide are also included in the larger work. An unusual fault is the incorrect citation of authors in the species names. Throughout both books, author's names appearing after species' names are not placed in brackets, even when convention demands this. The species accounts are similar to those in the Middle American checklist (see below), in that they are divided into sections on Key Literature and Distribution. In addition, they list recognised subspecies (but not their distribution).

The most useful aspect of both works are the extensive keys to all taxa. The West Indies guide also includes 11 plates of the head and dewlap colouration of 104 *Anolis* species, eight colour photographs of *Epicrates* and *Tropidophis*, and 47 drawings of *Eleutherodactylus* (the largest vertebrate genus which includes 425 species of mainly nondescript little frogs!).

Middle American Herpetology
Jaime Villa, Larry D. Wilson and Jerry D. Johnson, 1988. xxxvi + 132 pp. University of Missouri Press (UMP, 200 Lewis Hall, Columbia, MO 65211, U.S.A.), US $35.00, hardcover.

This beautifully produced annotated checklist summarizes the herpetofauna of southern Mexico, Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama. Each species account is divided into sections on Key literature, Illustrations, and Distribution (giving, where available, a reference for each country). For some species additional Notes are given, detailing taxonomic annotations, whilst for a few species the names used in the now out-dated *Catalogue of Neotropical Squamata* are shown.

The book starts with a section of 16 colour plates of 91 common or important species, before giving an Introduction in both English and Spanish. Tables for amphibians and reptiles list publications dealing with specific taxa or groups of taxa in Middle America that may assist in identification. This is followed by the species accounts, 21 pages of approximately 420 major references, and a detailed scientific index. A staggering 782 species are detailed (southern Africa has about 560), including 11 caecilians, 77 salamanders, 239 frogs and toads, 3 crocodilians, 26 chelonians, 180 lizards, 3 amphisbaenians and 243 snakes! The absence of any reference to ecological or biological data limit the book's general use, and it is therefore of less use to an African herpetologist than, say, Cogger's excellent *Catalogue* of the Australian herpetofauna.

SOUTH AMERICA
Reptiles del centro, centro-oeste y sur de la Argentina. Herpetofauna de las zonas arídas y semiarídas (in Spanish)
J. M. Cei, 1986. 528 pp. Museo Regionale di Science Naturali, Torino, Monografie 4. (Museo Regionale di Science Naturali, Via Maria Vittoria 18, 10123 Torino, Italy) 90 000 Lit. (approx. US $72.00), hardcover.

This fine book covers the reptiles of the arid and semi-arid regions of southern Argentina, including the Patagonian and Monte regions and the eastern Andean slopes. As such it serves as a useful comparative fauna for the Namib-Karoo biome of southern Africa, although the Spanish text may present a barrier. Although the very detailed keys are presented in both Spanish and English, the book would have found a wider audience if a longer and more comprehensive English summary had been appended.

There is a generous (excessive?) introduction (80 pages) covering diverse topics (e.g. internal and external anatomy, serotaxonomic and cytotaxonomic relationships, and zoogeography). Curiously, little vegetational or geological information is given for the region, and it is therefore impossible to relate this to the ecology and distributions of the species. In his taxonomic arrangement, Cei has incorporated an early (1982) cladogram of Estes and De Queiroz's (see review of *Phylogenetic Relationships of the Lizard Families*, in *J. Herpetol. Assoc. Afr.* **39**: 46-47) that has lead him to, perhaps prematurely, treat snakes, geckos and amphisbaenians as Infraorders within the Autarchoglossa. This is an arrangement Estes and De Queiroz (1987) now consider, conservatively, to be *incertae sedis*.

The species accounts, of 2 tortoises, 80 lizards (61 iguanids, 6 teiids, 2 gymnophthalmids, 2 skinks, 7 geckos, 2 anguids), 4 amphisbaenians, and 32 snakes (2 boids, 4 leptotyphlopids, 22 xenodontines, 1 elapid, 3 crotalids) are all very thorough and accompanied with spot maps (sometimes represented by shading). Two-thirds of the species are endemic to the region. Of particular interest is the section of 24 colour plates (144 photographs) of living reptiles, including many very rare species. The possible mimetic resemblance of *Waglerophis merremi* and *Bothrops alternatus* is striking. It is also exciting to compare the adaptive radiation of the iguanid lizard genus *Liolaemus*, which contains 120+ species, of which 51 species and subspecies are covered in the book. Many of these seem to have exploited the niches occupied in southern Africa by *Agama*, *Cordylus* and *Pseudocordylus*.

Both Cei and the Italian publishers deserve credit for producing this excellent review of a poorly-known herpetofauna.

DINOSAURS
Yes, a couple of reviews on dinosaurs! They are, after all, related to living reptiles, even if only distantly to most.

Dinosaurs are 'in' again, and deservedly so. Recent controversy over cyclic mass extinctions, and the opposing theories of cosmic collisions or global volcanism, has stimulated special reviews in *Time* and *National Geographic*, as well as a spate of new books. With this renaissance in attitudes towards dinosaurs, there is a growing appreciation of their smaller, living relatives. In fact, there seems to have been an interesting, and paradoxical, evolution in attitudes.

The first faltering steps came from Africa, a continent whose reptiles, living and extinct, remain poorly studied. To the many people who thought of crocs and dinosaurs as blundering, blood-thirsty anacronisms, Tony Pooley's studies on maternal care in the Nile Crocodile came as a shock. Although the findings were initially treated with scepticism, the attentive and complex maternal behaviour of crocodiles is now well established. And so, as the lives of crocodiles became real and respected, dinosaurs also became freed of our blinkered steryotypes. They are no longer just bones and footprints. They have become the focus of such acceptable ecological concepts as biomass, foraging modes and reproductive strategies. In other words they have come 'alive'. The following books, more than any others, prove this point.

The Dinosaur Heresies. A revolutionary view of dinosaurs
Robert Bakker, 1987. 482 pp. Longman Scientific and Technical (Longman Group U.K. Lid., Longman House, Burnt Mill, Harlow, Essex CM20 2JE, England) £14.95 plus postage, hardcover.

Probably no one person has done more to promote the revolution in attitudes towards dinosaurs as Robert Bakker, the 'enfant terrablis' of palaeontology. He has long promoted such controversial views as the endothermy of dinosaurs, of brontosaurs as the 'giraffes' of dry forests, and galloping 'rhino-like' *Triceratops*. Perhaps one of his most controversial, and stimulating, suggestions (presented in a paper to *Scientific American* in 1975) is that dinosaurs are not extinct, but survive, in part, as their direct descendents - birds. He proposes a drastic taxonomic re-arrangement, with a Class

Archosauria containing a Subclass Dinosauria of which birds are but a Superorder (Aves). As for the Class Reptilia - "I advocate abandonment"!

Bakker has a 'rat-tat' journalistic style that is well complemented by his many humerous, lively drawings. He introduces the history and ecology of both living and extinct reptiles in a simple and easily understood manner, and the titles of some of the chapters gives a good idea of the book's content and style, e.g.:

3. Mesozoic Class Warfare: Cold bloods versus the Fabulous furballs
4. Dinosaurs score where Komodo dragons fail
9. When dinosaurs invented flowers
15. Sex and intimidation: the body language of dinosaurs
22. Dinosaurs have Class, etc.

However, don't expect formal, balanced arguments. Bakker has the missionary zeal of an Ayetullah and his aim is to convert, even if it means bending a few rules.

Although Bakker may be familiar with dinosaurs, his knowledge of living reptiles is suspect, and this has led to some silly generalisations and exaggerations. Africa lacks the terrapin diversity of American freshwaters, and his comment that a "....single Congolese river system can display a dozen and a half specialised turtles, swimming after prey ..." (p. 58) is a gross exaggeration. At most they may contain a single soft-shell (*Trionyx triunguis*) and perhaps three or four *Pelusios*. Similarly, describing the Mediterranean wall lizard as ".. a hefty four-pounder" (p. 60) may seem 'itty-bitty' compared with dinosaurs, but it is still two orders of magnitude too large for any living *Podarcis*. Although I'm personally unfamiliar with the massive marine toad (*Bufo marinus*), I have never come across reference to its "....poisonous saliva, which numbs their prey into submission." (p. 54). Certainly it has protective parotid secretions, but these are used for defence and not offence (although offensive they may be!).

Bakker's attempt to relate rate of evolutionary change (speciation) with metabolic rate (pp. 401-405) is very dubious. Ignoring for the moment invertebrates, the cichlid genus *Haplochromis* in the African Great Lakes has speciated explosively (300 species in 5 million years). In the same lakes the cyprinids (e.g. *Barbus* spp.) show only a fraction of this evolutionary activity, but no one would relate this to differences to metabolic activity. Rather, reasons are sought in terms of sexual recognition and specialised breeding modes (e.g. mouth-brooding). I suspect that the undoubted rapid evolution of the bizarre horned dinosaurs in the Late Cretaceous is not an argument for warm-bloodedness, but rather is explained better in a similar manner to that of haplochromine cichlids!

Nearly everyone is intrigued by dinosaurs, and this book is quite simply the most stimulating and enjoyable discussion of their world that I've read. But take care, the tale is preached by rabid convert!

Dinosaurs Past and Present. Vols. 1 and 2
Sylvia J. Czerkas and Everett C. Olson (eds.), 1987. 180 pp., 164 pp. Natural History Museum Los Angeles (Publications Department, NHMLA, Exposition Park, Los Angles, California 90007, U.S.A.) US $35.00 (per vol.) plus postage, hardcover.

These superbly illustrated volumes form the permanent record of an exhibition and symposium (of the same name) organised by the Natural History Museum of Los Angeles County, and which has been shown at a number of American and Canadian Museums. How I regret missing it, and how grateful I am to the editors and publishers that such beautiful books record its passing.

Along with space monsters, dinosaurs have spawned a whole cult art that has stretched artistic licence and imagination to the limit. So often are the two (aliens and dinosaurs) juxtaposed, that we loose sight of our kinship with these 'terrible lizards' for, like us, they are just animals, subject to the same environment and evolutionary forces on this ever-changing world. As Bakker has argued elequently for the reality of dinosaurs (see above), so these books recreate the visual panoramas and portraits with which the mind conjours, and our dreams play, in recreating those distant times.

A catalogue of the 144 dinosaur studies included in the Exhibition opens Vol. 1, and many of these illuminate the twelve contributions to the symposium that complete the rest of both volumes. The pictures range from the familiar Yale murals of the "Age of Reptiles" and early studies of Charles Knight, to a number of modern works including John Gurche's stunning picture of fighting *Daspletosaurus* and *Styrachosaurus* (that was used as the dust wrapper for Bakker's book). Throughout the books, the modern paintings of Doug Henderson, Mike Hallett, Gregory Paul and Eleanor Kish, etc., emphasize the 'familiarity' of dinosaurs; they are the giraffes, elephants and rhinos of those ancient plains and forests. An interesting and thought-provoking picture by Henderson shows varanid lizards robbing eggs from the nest of a hypsilophodont dinosaur, much as they still do with crocodile nests. For someone like myself, blighted by preconceptions and falsehoods, it is a shock to find that many familiar groups of extant reptiles that scampered and squirmed at the feet of dinosaurs now do so among those of elephants!

In the opening article, Bakker (who else ?) introduces the "Return of the Dancing Dinosaurs". He persuasively argues that the limb structure and fossil footprints of many dinosaurs, including *Triceratops* and the brontosaurs, show that they moved at speeds equal to or even faster than those of extant large mammals. Callison's article takes the opposite tack and discusses "Small problems: Biological implications of tiny dinosaurs", whilst Lockley shows how the analysis of dinosaur trackways can give valuable insight into their ecology. The science required to clothe fossil bones and to reconstruct the living animal and its environment, are well-illustrated and described in two exceptional articles with similar titles and themes; Hallett, "The Scientific approach to the Art of bringing Dinosaurs to Life", and Paul, "The Science and Art of restoring the life appearance of Dinosaurs and their relatives: A Rigorous How-to guide".

Together with Bakker's book, these beautiful volumes should lay the ghost of dinosaurs as "....lumbering, swamp-bound, cold-blooded behemoths...."

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RECENT AFRICAN HERPETOLOGICAL LITERATURE: 15

Compiled by G.V. HAAGNER[1], W.R. BRANCH[1] and M. BURGER[2]

[1]Port Elizabeth Museum, P.O. Box 13147, Humewood 6013, South Africa
[2]Cape Nature Conservation, Private Bag X1006, Grahamstown 6140, South Africa

The series of *Recent African Herpetological Literature* lists (no. 1-14) have until now been published in the *Journal of the Herpetological Association of Africa*. Following a change in journal policy, these lists will now be published in *African Herp News*.

Andreone, F. 1991. Reptile field records from Malagasy rainforests. *Boll. Mus. reg. Sci. nat. Torino* **9**(2): 427-460.

Andreone, F. 1992. Syntopy of *Mantella cowani* Boulenger and *Mantella madagascariensis* (Grandidier) in central-east Madagascar, with notes on the colouration in the genus *Mantella* (Anura: Mantellidae). *Boll. Mus. reg. Sci. nat. Torino* **10**(2): 421-450.

Annis, J.M. 1993. Oedema and other health problems in captive chameleons - is vitamin imbalance the primary suspect ? *The Chameleon* **1**(4): 12-16.

Baard, E.H.W. 1992. Die suurpootjie. *Tortoise Soc. Natal Newsl.* **3**(2): 6-8.

Baig, H.J. & W. Bohme, F. 1991. Callous scalation in female agamid lizards (*Stellio* group of *Agama*) and its functional implications. *Bonn. zool. Beitr.* **42**(3-4): 275-281.

Bates, M.F. 1989. Developments in the management of reptile and amphibian collections at the National Museum, Bloemfontein. *Sthn. Afr. Mus. Assoc. Bull.* **18**(8): 229-304.

Bates, M.F. 1990. Worm snakes found in cow dung. *Mirafra* **7**(3): 68-69.

Bates, M.F. 1990. The snake-eating snake. *Culna* **38:** 30.

Bates, M.F. 1990. An unusual lizard exhibit. *Culna* **39:** 31-32.

Bates, M.F. 1991. The giant frog of the Lesotho mountains. *Culna* **41**: 23-24.

Bates, M.F. 1992. *The herpetofauna of the Orange Free State - with special emphasis on biogeographical patterning*. Unpubl. M.Sc. thesis, Univ. of Natal, Durban.

Bates, M.F. 1993. Extremely rare lizards found at Sterkfontein Dam Nature Reserve. *Culna* **44**: 34-36.

Bates, M.F. 1993. Amphisbaenians - what are they? *Culna* **45:** 7-10

Bauer, A.M. & Russell, A.P. 1992. The evolutionary significance of regional integumentary loss in island geckos: a complement to caudal autotomy. *Ethology, Ecology & Evolution* **4**: 343-358.

Bauer, A.M., Branch, W.R. & Haacke, W.D. 1993. The herpetofauna of the Kamanjab area and adjacent Damaraland, Namibia. *Madoqua* **18**(2): 117-145.

Bauer, A.M., Russell, A.P. & Shadwick, R.E. 1993. Skin mechanics and morphology of two species of *Pachydactylus* (Reptilia: Gekkonidae). *S. Afr. J. Zool.* **28**(4): 192-197.

Behler, J.L., Bloxam, Q.M.C., Rakatovao, E.R. & Randriamahazo, H.J.A.R. 1993. New localities for *Pyxis planicauda* in west-central Madagascar. *Chelonian Conserv. Biol.* **1**(1): 48.

Bell, C. 1993. Notes on the Cape dwarf chameleon (*Bradypodion pumilum*). *The Chameleon* **1**(4): 9-10.

Blommersschlosser, R.M.A. 1993. Systematic relationships of the Mantellinae Laurent 1946 (Anura, Ranoidea). *Ethology, Ecology & Evolution* **5**(2): 199-218.

Böhme, W., Busse, K. & Glaw, F. 1993. The identity of *Mantella cowani* Boulenger, 1882 and *Mantella haraldmeieri* Busse, 1981 (Anura: Mantellinae). *Amphibia-Reptilia* **14**(3): 269-274.

Bourquin, O. 1992. Biggest recorded Natal hinged tortoise. *Tortoise Soc. Natal Newsl.* **3**(3): 7-8.

Branch, W.R. 1993. Woe to be a frog. *Pelea* **11**: 115-117.

Branch, W.R. 1993. *A photographic guide to Southern African snakes and other reptiles.* Struik Publ., Cape Town.

Branch, W.R. 1993. Avian predation on tortoises. *Tortoise Soc. Natal Newsl.* **4**(3): 15-16.

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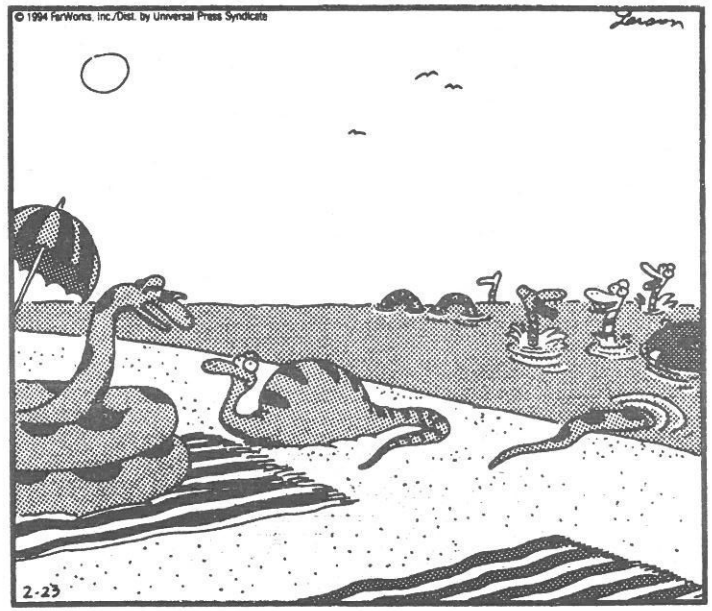

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