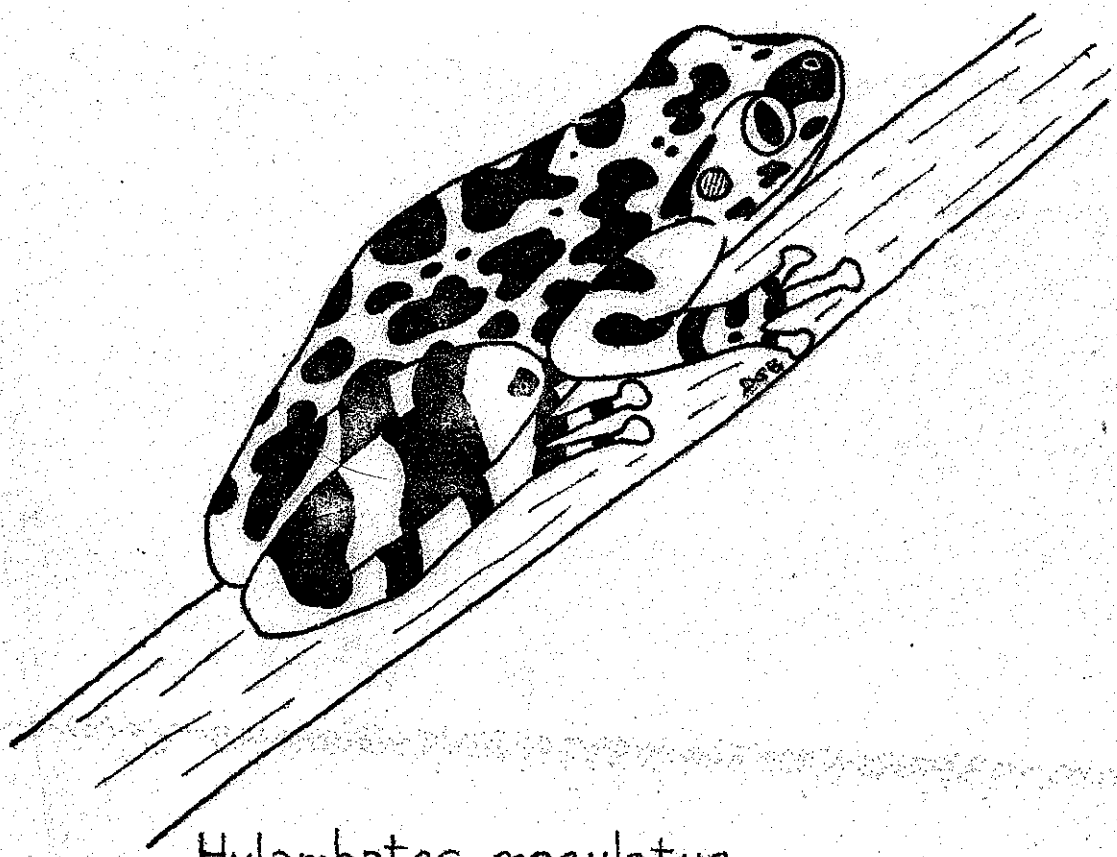
H.A.R.
JOURNAL



Hylambates maculatus

THE JOURNAL OF THE HERPETOLOGICAL ASSOCIATION OF RHODESIA.

No. 23/24. February, 1965.

CONTENTS:

NEW MEMBERS:

M. S. Patton, Driekoppen Residence, University of Cape Town, MOWBRAY, C.P., South Africa.

A. J. Lambiris, 12 Hyde Road, Belvedere, SALISBURY, Rhodesia.

E. L. Husting, Research Laboratory, P. O. Box 8105, CAUSEWAY, Rhodesia.

NEW ASSOCIATE MEMBERS:

A3C R. G. Markel, C.M.R. Box 41943, Kelly A.F.B., TEXAS 78241, U.S.A.

Dr. Margaret M. Stewart, Dept. of Biology, State University of New York, 135 Western Avenue, ALBANY, NEW YORK 11203, U.S.A.

R. Klein, 3084 Coney Island Avenue, Brooklyn, NEW YORK 11235, U. S. A.

NEW ASSOCIATE MEMBERS (Contd.)

R. D. Osborne, 72 Dorchester Road, Western Park, LEICESTER, England.

J. A. Peters, Division of Reptiles & Amphibians, United States National Museum, WASHINGTON 25, D.C., U.S.A.

The Library, American Museum of Natural History, Central Park West at 79th Street, NEW YORK, NEW YORK 10024, U.S.A. (Exchange publications).

CHANGES OF ADDRESS:

V. J. Wilson, c/o National Museum, P. O. Box 240, BULAWAYO, Rhodesia.

L.D.E.F. Vesey-FitzGerald, Tanganyika National Parks, P.O. Box 3134, ARUSHA, Tanzania.

L. Balarin, 10 Newstead Road, Marlborough, SALISBURY N.W. 25, Rhodesia.

B. Marsh, Buffalo Range Game Ranch, BUFFALO RANGE, Rhodesia.

Dr. C. K. Brain, Transvaal Museum, P.O.Box 413, PRETORIA, Transvaal, S.A.

J. D. Visser, 11 Gloucester Court, Graham Road, SEA POINT, C.P., S.Africa.

RESIGNATIONS:

J. Weimann.

EDITORIAL:

Many readers must have been wondering if the H. A. R. had at last given up the ghost. It still survives, but it is not clear whether it is moribund or merely dormant.

During 1964 the Editor was fully occupied with display work and administration at the Umtali Museum and virtually nothing was done in the herpetological field. If more members had sent in articles, it might still have been possible to bring out a journal in August, but only a few contributions were received. Voting on the proposed constitutional changes was also poor, and it was not until late in the year that the 51% mark in returned voting forms was reached. The results were as follows:-

Renaming the Association - "The Herpetological Association of Africa". Motion rejected by 11 votes to 6, with 13 abstentions.

New Constitution (except for name of Association). Approved by 17 votes to nil, with 13 abstentions.

Since the original proposal to change the name of the Association was made the case for such a move has become much stronger. With the passing of Federation, Rhodesia has shrunk in size and of the 43 H.A.R. Members in Africa, less than half (21) are in Rhodesia, the rest being divided between South Africa (12), Zambia (6), Malawi (1), Tanzania (2) and Kenya (1). The metamorphosis of the H.A.R. into the "Herpetological Association of

Africa" will encourage our members in South and East Africa to make a bigger contribution to the Journal. Such a change is also needed to prevent that parochial outlook which has been the bane of African herpetology in the past.

The revised Constitution for the H.A.A. is included in this Journal. All paid-up members are asked to cast a postal vote on the enclosed form, approving or rejecting the absorbtion of the H.A.R. into the new H.A.A. It is hoped that a two-thirds majority in favour of such a move will be obtained. If such a majority is not obtained, those members wishing to maintain an independent local H.A.R. will have to appoint a new committee from among themselves to take over as soon as possible after the 1st April, 1965.

Nominations for the positions of Chairman and Hon. Secretary/Treasurer of the Herpetological Association of Africa should be submitted to me before 31st March, 1965.

I regret to report that the H.A.R. lost one of its Honorary Life Members when Dr. Walter Rose died in September last year. Many members no doubt had their initial interest in herpetology roused by Dr. Rose's popular books and his revised "Reptiles and Amphibians of Southern Africa", will probably remain the most popular introduction to the subject for some years to come. Chris Gow has contributed an Obituary.

This Journal has, as usual, been produced in a hurry, with many of the articles scribbled out at the last minute. I would welcome any comments or criticisms on my Key to Rhodesian Lizards, which will certainly need revision. My article on taxonomic and distributional problems is an "Irish stew" of undigested ideas and raw data. It should not be quoted, but I would welcome comments on any of the ideas put forward.

DONALD G. BROADLEY,
HON. SECRETARY/TREASURER, H. A. R.,
UMTALI MUSEUM,
UMTALI,
RHODESIA.

THE HERPETOLOGICAL ASSOCIATION OF AFRICA.

CONSTITUTION AND RULES:

1. The name of the Association shall be the Herpetological Association of Africa.

2. The objects of the Association are:-

(a) To collect and exchange, inter alia, through the medium of the Association Journal, information on all aspects of the zoogeography, ecology and behaviour of the herpetofauna of Africa. To encourage the publication of this information in both scientific journals and popular literature.

(b) To build up comprehensive study collections of African reptiles and amphibians in the Museums of Africa.

(c) To educate the public towards a sane and reasonable attitude to reptiles and amphibians in general and snakes in particular. This object may be carried out by means of lectures, exhibitions, films and articles.

(d) To promote, where necessary, the addition of further reptiles and amphibians to the list of protected fauna. To ensure that the protection afforded by existing laws and by National Parks and Wild Life Sanctuaries is effectual.

(e) To encourage the study of reptiles in captivity and exchange specimens among members.

(f) To organise expeditions to the lesser known areas of Africa and to render all possible assistance to members on field trips away from their own districts.

(g) To collect and receive subscriptions and donations for the purpose of carrying out the above objects.

MEMBERSHIP:

3. (a) Membership shall be open to any herpetologist, resident in Africa, who has given satisfactory proof of his enthusiasm and ability.

(b) Candidates for membership may be introduced by a member, or may qualify by submitting material and observations to the Hon. Secretary.

(c) Herpetologists and organisations outside Africa may become Associate Members. An Associate Member shall have no say in the running of the Association, but will receive the Journal as it appears.

4. A Member may be expelled from the Association for failing to support its objects. Such action shall require a two-thirds majority in a postal vote by all members.

5. (a) Members shall pay an Entrance Fee of Ten shillings (R1) and also an Annual Subscription of Ten shillings (R1). Associate Members shall pay an Annual Subscription of Ten shillings (1 Dollar 50 cents U.S.), except where an exchange of publications has been agreed. Life Members shall subscribe £7.10/- (R 15), or £3 (R 6) if over the age of 60.

(b) The Entrance and first Annual Subscription shall be paid on admission to Membership. Thereafter, subscriptions shall fall due on the first of April each year. Membership is automatically forfeited by those more than one year in arrears with subscriptions.

6. Branches may be formed within the Association in order to co-ordinate the activities of members in their own district. The Branch shall have no separate voting powers. Branches shall be self-supporting and shall have an Honorary Branch Secretary/Treasurer.

7. All Association and Branch Accounts shall be audited annually.

8. The Officers of the Association shall consist of a Chairman and an Honorary Secretary/Treasurer.

9. The Constitution may be amended by a two-thirds majority of members voting by post. Provided that not less than 51% of all paid-up Association Members cast their votes.

10. The official organ of the Association shall be the 'Journal of the Herpetological Association of Africa', published twice yearly and circulated to all members. This will be compiled by the Hon. Secretary, acting as Editor, using information and material received from members, abstracted from scientific journals, etc.

11. The Association Badge shall be a rearing Banded Cobra (Naja haje haje, var. annulifera) in black and gold, superimposed on a green map of Africa. Below, on a scarlet scroll, is the motto "Ex Africa semper aliquid novi."

HON. TREASURER'S REPORT FOR THE YEAR 1963-64.

BALANCE SHEET FOR THE YEAR ENDING 31ST MARCH, 1964.

		£ s d		£ s d
Cash Balance as at 31st March, 1963		111 11 1	Current Account - Netherlands Bank	7 6 10
Capital Reserve As at 31/3/63	54 7 5		C. A. B. S. Savings Account	108 17 5
Less Depreciation on Office Equipment at 20%	9 12 6	44 14 11	Cash in Hand	8 4 2
Excess of Income over Expenditure for the year		12 17 4	Office Equipment	38 9 11
			Blazer Badges on Hand	6 5 -
		£169 3 4		£169 3 4

REVENUE & EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31ST MARCH, 1964.

EXPENDITURE:	£ s d	REVENUE:	£ s d
Stationery & H. A. R. Journal	7 10 -	Entrance Fees and Subscriotions	28 6 1
Postages	1 17 -		
Bank Charges	1 2 6	Interest on C.A.B.S. Savings Account	3 13 6
General Meeting Expenses	10 -		
Subscription - Rhodesian Scientific Association	3 3 -		
Subscriptions American Herpetological Societies	4 19 9		
Balance being Excess of Revenue over Expenditure for the year	12 17 4		
	£31 19 7		£31 19 7

Being a true and correct statement of the Accounts and Books of the Herpetological Association of Rhodesia as at 31st March, 1964.

DONALD G. BROADLEY,
HON. SECRETARY/TREASURER.

I have examined the Income & Expenditure Account and Balance Sheet of the Herpetological Association of Rhodesia. I certify that as a result of my audit, that in my opinion, the Income & Expenditure Account and Balance Sheet are a true and proper account of the transactions of the Herpetological Association of Rhodesia during the year ending 31st March, 1964.

D. K. BLAKE,
HON. AUDITOR.

A PROVISIONAL CHECK LIST OF THE LIZARDS OF RHODESIA.

By

D. G. BROADLEY.

February, 1965.

GEKKONIDAE

Hemidactylus mabouia (Jonnes)
Tropical House Gecko.
Common throughout Rhodesia. Lives in rock crevices and on trees (especially Baobabs) and houses.

Lygodactylus capensis (A. Smith)
Cape Dwarf Gecko.
Common throughout Rhodesia. Lives on trees, rocks and houses.

Lygodactylus bernardi FitzSimons.
Inyangani Dwarf Gecko.
Inyangani Mountain and Troutbeck, Inyanga. Rupicolous.

Lygodactylus stevensoni Hewitt
Khami Dwarf Gecko.
Khami Ruins and Matopos. Lives on Fig trees and rocks.

Lygodactylus picturatus chobiensis FitzSimons
Painted Gecko.
The Zambezi Valley, south to Gokwe and Sinoia. Arboreal, common on Mopane trees.

Afroedura transvaalica transvaalica Hewitt
Transvaal Flat Gecko.
Throughout Rhodesia except the north-west. Rupiculous and very gregarious.

Homopholis wahlbergii A. Smith
Wahlberg's Gecko
Throughout Rhodesia. Lives in rock crevices, Swallows nests, on trees, occasionally on houses.

Pachydactylus punctatus punctatus Peters
Spotted Ground Gecko
Throughout Rhodesia. Lives under stones and logs.

Pachydactylus capensis tigrinus Van Dam
Tiger striped Gecko
The Limpopo Basin. Rupicolous.

Pachydactylus capensis affinis Boulenger
Cape Gecko
Throughout Rhodesia except the north-west and extreme south. Rupicolous, many living together in a crevice.

Pachydactylus capensis oshaughnessyi Boulenger
Banded Gecko
Northern half of Rhodesia. Found under stones and logs. Probably a distinct species.

Pachydactylus bibronii (A. Smith)
Bibron's Gecko
Throughout Rhodesia. In rock crevices or on house walls.

Pachydactylus tetensis Loveridge
Tete Gecko
Zambezi Valley and Mtoko District. Rupiculous.

AGAMIDAE

Agama kirkii Boulenger
Kirk's Rock Agama
Throughout Rhodesia. Rupicolous. Status of A.k. fitsimonsi Loveridge under review.

Agama cyanogaster atricollis A. Smith
Tree Agama
Throughout Rhodesia. Arboreal, occasionally on rocks. Perhaps a distinct species.

Agama hispida armata Peters
Spiny Agama
Throughout Rhodesia. Terrestrial, but sometimes climbs trees. Status of local subspecies requires review.

CHAMAELEONTIDAE:

Chamaeleo dilepis Leach
Common Flap-necked Chameleon
Throughout Rhodesia.

Chamaeleo marshalli Boulenger
Marshall's Chameleon
Montane forests on Stapleford, Vumba Mountain and Mount Selinda.

SCINCIDAE

Mabuya homalocephala depressa Peters
Peters' sand Skink
Recorded only from Malipati Drift on the Nuanetsi River.

Mabuya quinquetaeniata margaritifer Peters
Southern Rainbow Skink
Throughout Rhodesia except the Eastern Districts. Rupicolous.

Mabuya quinquetaeniata obsti Werner
Tanganyika Rainbow Skink
Eastern Districts of Rhodesia. Rupicolous.

Mabuya capensis (Gray)
Cape Skink
Inyanga District in montane grassland.

Mabuya lacertiformis Peters
Bronze Rock Skink
Throughout Rhodesia. Rupicolous.

Mabuya longiloba longiloba Methven & Hewitt
Longlobed Skink
Wankie National Park. Found under logs in Kalahari Sand.

Mabuya varia (Peters)
Variegated Skink
Common throughout Rhodesia. Terrestrial.

Mabuya striata (Peters)
Common Striped Skink
Common throughout Rhodesia on houses, trees and rocks.

Scelotes arnoldi arnoldi Hewitt
Vumba Skink
Montane grasslands of the Eastern Districts from Inyanga south to Melsetter.

Scelotes limpopoensis FitzSimons
Limpopo Skink
Beitbridge area, arenicolous.

Riopa sundevallii (A. Smith)
Sundevall's Skink
Throughout Rhodesia. Fossorial.

Ablepharus wahlbergii (A. Smith)
Wahlberg's Snake-eyed Skink
Throughout Rhodesia. Fossorial.

Typhlacontias ngamiensis FitzSimons.
N'gami Sand Skink
Wankie District, in Kalahari Sand.

Acontias plumbeus plumbeus Bianconi
Giant limbless Skink
Eastern Border; Burma Valley and Jersey Tea Estates. Fossorial.

Acontias plumbeus broadleyi FitzSimons
Olive Limbless Skink
Salisbury south to Matopos, in schist and granite areas. Fossorial.

Acontias plumbeus occidentalis FitzSimons
Kalahari Limbless Skink
Bulawayo District in Kalahari Sand.

Typhlosaurus cregoi cregoi Boulenger
Crego's Legless Skink
A juvenile specimen recovered from the stomach of a Platysaurus collected 20 miles west of Birchenough Bridge appears to represent this form.

Typhlosaurus cregoi bicolor Hewitt
Manicaland Legless Skink
Montane grasslands of Eastern Districts, from Inyanga south to Himalaya.

Typhlosaurus lineatus subsp.
Kalahari Striped legless Skink
Malipati Drift, Nuanetsi.

The fossorial skinks, with limbs rudimentary or absent, are poorly known. Specimens are most easily obtained during clearing or ploughing operations.

CORDYLIDAE

Cordylus warreni regius Broadley
Regal Girdled Lizard
Eastern Districts from Umtali south to Chimanimani Mountains. Rupicolous.

Cordylus cordylus tropidosternum Cope
Eastern Arboreal Girdled Lizard
Eastern Districts. Arboreal, under loose bark or in hollow trees. Perhaps a full species.

Cordylus cordylus jonesii (Boulenger)
Jones' Arboreal Girdled Lizard
South-west of Rhodesia. Arboreal, under loose bark or in hollow trees. Perhaps a subspecies of tropidosternum.

Cordylus cordylus rhodesianus (Hewitt)
Rhodesian Rock Girdled Lizard
Eastern Highlands of Rhodesia. Rupicolous.

Platysaurus ocellatus Broadley
Chimanimani Flat Lizard
Endemic to the western ridge of the Chimanimani Mountains. Rupicolous.

Platysaurus torquatus Peters
Tete Flat Lizard
Mtoko District. Rupicolous.

Platysaurus intermedius pungweensis Broadley
Pungwe Flat Lizard
Honde and Pungwe Valleys on the eastern border. Rupicolous.

Platysaurus intermedius rhodesianus FitzSimons
Rhodesian Greater Flat Lizard
Southern half of Rhodesia and Wankie District. Rupicolous.

Platysaurus intermedius subniger Broadley
Black-bellied Greater Flat Lizard
North-eastern Districts of Rhodesia. Rupicolous.

Platysaurus imperator Broadley
Emperor Flat Lizard
Mtoko District. Rupicolous.

Gerrhosaurus validus validus A. Smith
Plated Rock Lizard
Throughout Rhodesia. Rupicolous.

Gerrhosaurus major grandis Boulenger
Greater African Plated Lizard
Lowveld areas of Rhodesia. Lives in termitaria, hollow logs, rock crevices.

Gerrhosaurus nigrolineatus nigrolineatus Hallowell
Black-lined Plated Lizard
Western half of Rhodesia. Terrestrial.

Gerrhosaurus flavigularis Weigmann
Yellow-throated Plated Lizard
Throughout Rhodesia, except North-west. Terrestrial.

Chamaesaura macrolepis Cope
Large-scaled Snake-Lizard
Chimanimani Mountains. Grassland.

LACERTIDAE

Nucras intertexta holubi (Steindachner)
Striped Sand Lizard
All Rhodesia except the lowveld.

Nucras intertexta ornata (Gray)
Ornate Sand Lizard
Zambezi Valley and the Southeastern lowveld.

Latastia johnstoni Boulenger
Nyasa long-tailed Lizard
Eldorado near Sinoia. Only once recorded.

Eremias lugubris (A. Smith)
Black & Yellow Sand Lizard
Limpopo, Sabi and Zambezi Valleys.

Ichnotrophis squamulosa Peters
Peters' Rough-scaled Sand Lizard
Throughout Rhodesia.

Ichnotrophis capensis (A. Smith)
Cape Rough-scaled Sand Lizard
Throughout Rhodesia.

VARANIDAE

Varanus niloticus niloticus (Linnaeus)
Water Leguaan
Common throughout Rhodesia.

Varanus exanthematicus albigularis (Daudin)
Rock or Tree Leguaan
Throughout Rhodesia except for highlands.

A PROVISIONAL KEY TO THE LIZARDS OF RHODESIA.

A. KEY TO THE FAMILIES.

1. Upper surface of head covered with granules or small scales..... 2
   Upper surface of head covered with large symmetrical shields.... 5

2. Eyes without movable eyelids; digits dilated, with transverse lamellae below ..... GEKKONIDAE
   Eyes with movable eyelids; digits slender, without transverse lamellae below 3

3. Tongue short, broad, covered with papillae ..... AGAMIDAE
   Tongue very long and slender, not covered with papillae 4

4. Tongue cylindrical, with a club-shaped viscose tip, extremely extensile; dentition acrodent; digits arranged in two opposable bundles of 2 and 3 to form grasping members ..... CHAMAEIEON TIDAE
   Tongue slender, deeply forked at the tip, snakelike; dentition pleurodont; digits in a single plane ..... VARANIDAE

5. Dorsum covered with close-fitting imbricate scales; femoral pores absent ..... SCINCIDAE

Dorsum covered either with juxtaposed scales, forming regular transverse and longitudinal rows, or with small granules; femoral pores present 6

6. Body covered with large shields or scales forming regular longitudinal and transverse series, except in Platysaurus, which is covered with small granules above; a lateral fold divides the dorsal scalation from the ventral series of enlarged plates, except in Chamaesaura, which lacks forelimbs and has only vestigial hindlimbs..... CORDYLIDAE

7. Body covered in small scales; no lateral fold; limbs well developed ..... LACERTIDAE

B. KEY TO THE GEKKONIDAE.

1. Digits each with a strongly developed claw 2

Digits clawless, or with a minute inconspicuous claw; undivided transverse lamellae..... 8

2. Digits with a single long series of undivided transverse lamellae below ..... Homopholis wahlbergii

Digits with paired lamellae below 3

3. Two or three pairs of adhesive lamellae beneath fourth toe..... Afroedura t. transvaalica

Four or more pairs of adhesive lamellae beneath fourth toe..... 4

4. Thumb well developed; pupil vertical..... Hemidactylus mabouia

Thumb rudimentary; pupil round 5

5. Mental with two clefts converging forwards..... 6

Mental entire, without trace of clefts .....
.....Lygodactylus picturatus chobiensis

6. Mental clefts very short; back with numerous dark-edged pale spots..... Lygodactylus bernardi

Mental clefts long; back without numerous dark-edged pale spots..... 7

7. Throat uniform white or stippled with grey; snout-vent length rarely over 35 mm. ..... Lygodactylus capensis

Throat with dark lines converging on the mental; snout-vent length 34-40 mm. ..... Lygodactylus stevensoni

8. Dorsal scalation homogenous, with no enlarged scales or tubercles above ..... Pachydactylus punctatus punctatus

Dorsal scalation heterogenous, some enlarged scales or tubercles above..... 9

9. Dilated portion of digits small, with 4-6 transverse lamellae beneath fourth toe 10

Dilated portion of digits large, with 8-14 transverse lamellae beneath fourth toe..... 12

10. Dorsal markings consist of a broad, black-edged, cream crescent shaped marking on the nape and two broad cream crossbands between fore and hind limbs.... Pachydactylus capensis oshaughnessyi

Dorsal markings consist of 5-7 narrow cream transverse stripes or series of spots, with or without back spots..... 11

11. Dorsal markings consist of well defined cream transverse stripes without black spots between them..... ..... Pachydactylus capensis tigrinus

Dorsal markings consist of transverse rows of confluent cream spots with large black spots between them .... Pachydactylus capensis affinis

12. Nostril pierced between 3 nasals; femoral pores absent..... ..... Pachydactylus bibroni

Nostril pierced between 3 nasals, the rostral and/or the first labial; femoral pores present in males... Pachydactylus tetensis

C. KEY TO THE AGAMIDAE.

1. Dorsal scales homogenous..... Agama kirkii

Dorsal scales heterogenous 2

2. Occipital scale not enlarged; enlarged dorsal scales not spinose, irregularly disposed..... Agama cyanogaster

Occipital scale larger than those surrounding it; enlarged dorsal scales spinose, arranged in more or less regular longitudinal rows ..... Agama hispida armata

D. KEY TO THE CHAMAELEONTIDAE.

A gular and ventral crest present; occipital flaps covering nape; tail at least as long as body; claws simple; no rostral appendage ..... Chamaeleo dilepis

No gular or ventral crest present; no occipital lobes; tail shorter than body; claws bicuspid; a short rostral appendage present ..... Chamaeleo marshalli

E. KEY TO THE SCINCIDAE.

1. Nostril pierced in a nasal or between the nasal and the rostral.... 2

   Nostril pierced in the anterior part of a very large rostral, with the posterior border of which it is connected by a longitudinal groove; limbs absent, vermiform 13

2. Nostril well separated from the rostral; limbs well developed 3

   Nostril pierced between the rostral and a very small ring-like nasal, limbs short 4

3. Limbs well developed, scales distinctly carinated 5

   Limbs short; scales smooth 12

4. Limbs pentadactyle..... Scelotes arnoldi arnoldi

   Forelimb tridactyle, hindlimb tetradactyle ... Scelotes limpopoensis

5. Scales on soles of feet non-spinose, smooth or tubercular and rounded 6

   Scales on soles of feet keeled and usually spinose..... 8

6. 28-32 scales round middle of body .... Mabuya homalocephala depressa

   38-50 scales round middle of body 7

7. Scales round middle of body 38-44 Mabuya quinquetaeniata margaritifer

   Scales round middle of body 44-50 ..... Mabuya quinquetaeniata obsti

8. Subocular not narrowed below, similar to upper labials ..... Mabuya capensis

   Subocular distinctly narrowed below, or not reaching lip 9

9. Lobules on anterior border of ear opening long and lanceolate..... 10

   Lobules on anterior border of ear opening short and bluntly pointed..... 11

10. 30–34 Scales round middle of body; habitat Kalahari sand in Wankie District ..... Mabuya longiloba longiloba

36–42 Scales round middle of body; habitat rock outcrops..... ..... Mabuya lacertiformis

11. A conspicuous lateral white longitudinal stripe .... Mabuya varia

No conspicuous lateral white longitudinal stripe present .... Mabuya striata

12. Lower eylid moveable, scaly; a pair of frontoparietals .... Riopa sundevallii

Lower eyelid immoveable, but with a large transparent disc which covers the eye; a single large frontoparietal .... Ablepharus wahlbergii

13. Eye completely exposed, without rudiments of eyelids; three transversely enlarged head shields between rostral and interparietal; no enlarged preanal plate..... Typhlosaurus ngamiensis

Eye covered by an eyelid or the head shields; two transversely enlarged head shields between rostral and interparietal; an enlarged preanal plate 14

14. Lower eyelid movable, elongate 15

No eyelids present, eye covered by the head shields and discernable only as a dark spot 17

15. 18–20 scales round middle of body; ventrals 150–163 .... Acontias plumbeus plumbeus

16 scales round middle of body; ventrals 165–179 16

16. Black above and below, with a few white ventrals anteriorly ... . Acontias plumbeus occidentalis

Grey-brown to olive green above, white below..... ..... Acontias plumbeus broadleyi

17. Snout conical; 16–20 scales round middle of body 18

Snout with a sharp horizontal edge and flattened below; 12 scales round middle of body..... Typhlosaurus lineatus subsp.

18. Two supraoculars present ..... Typhlosaurus cregoi cregoi

Three supraoculars present ..... Typhlosaurus cregoi bicolor

F. KEY TO THE CORDYLIDAE.

1. Limbs well developed 2

   Forelimbs absent; hindlimbs very small, monodactyle..... ..... *Chamaesaura macrolepis*

2. Back covered with regular transverse and longitudinal rows of scales with underlying osteodermal plates 3

   Back covered with small granules without underlying osteodermal plates 10

3. Frontoparietals absent; tail non-spinose, much longer than head and body..... 4

   A pair of frontoparietals present; tail spinose, little longer than head and body 7

4. Ventral plates in 14-18 longitudinal rows .... *Gerrhosaurus validus validus*

   Ventral plates in 8 or 10 longitudinal rows 5

5. Ventral plates in 10 longitudinal rows *Gerrhosaurus major grandis*

   Ventral plates in 8 longitudinal rows 6

6. Supraciliaries 4; prefrontals in broad contact .... *Gerrhosaurus nigrolineatus nigrolineatus*

   Supraciliaries 5; prefrontals separated or in very short contact.. ..... *Gerrhosaurus flavigularis*

7. Rostral in contact with the frontonasal; occipitals spinose .... *Cordylus warreni regius*

   Rostral usually separated from the frontonasal; occipitals non-spinose..... 8

8. Head not depressed or expanded in the temporal region; habitat - hollow trees, under loose bark, etc. 9

   Head depressed and expanded in the temporarl region; habitat - rock crevices and under stones ..... *Cordylus cordylus rhodesianus*

9. Adults measure over 80 mm. from snout to vent; range - southwest Rhodesia ..... *Cordylus cordylus tropidosternum*

   Adults measure less than 80 mm. from snout to vent; range - eastern Rhodesia ..... *Cordylus cordylus jonesii*

10. Scales on side of neck and flanks no larger than those on dorsum ..... Platysaurus ocellatus

Some scales on side of neck and flanks larger than those on dorsum 11

11. Enlarged scales on side of neck flattened; females and juveniles with Cambridge blue tails ..... Platysaurus torquatus

Enlarged scales on side of neck conical or spinose; females and juveniles with straw-coloured tails..... 12

12. Adult males with yellow head and crimson body, 115-146 mm. in length from snout to vent; adult females with three broad yellow stripes on head, 97-120 mm. from snout to vent .... Platysaurus imperator

Adult males with head and body green, at least anteriorly, rarely exceeding 115 mm. in length from snout to vent; adult females with three narrow cream stripes on head, rarely exceeding 97 mm. from snout to vent 13

13. Ventrals usually in 14-16 longitudinal rows .... Platysaurus intermedius pungweensis

Ventrals on 18-24 longitudinal rows 14

14. Nasals usually in contact; usually four upper labials anterior to subocular; chest of adult males suffused with green, blue or terra cotta..... Platysaurus intermedius rhodesianus

Nasals usually separated; usually five upper labials anterior to subocular; chest of adult males uniform black..... ..... Platysaurus intermedius subniger

G. KEY TO THE LACERTIDAE.

1. Subdigital lamellae smooth or tubercular; dorsal scales smooth 2

Subdigital lamellae keeled; dorsal scales keeled 3

2. Adults less than 80 mm. from snout to vent; dorsals transversely at midbody 45-60; lamellae under fourth toe 20-26; usually three well defined light dorsal longitudinal stripes .... Nucras intertexta holubi

Adults 80-96 mm. from snout to vent; dorsals transversely at midbody 38-50; lamellae under fourth toe 23-30; back uniform or with very faint longitudinal stripes .. Nucras intertexta ornata

3. A well defined collar; head shields smooth or slighly rugose ... 4

   Collar absent; head shields striated and keeled 5

4. Nostril between 3-4 nasals and the first labial, or separated from the latter by a narrow rim ..... Latastia johnstoni

   Nostril between 3 nasals, well separated from first labial .... Eremias lugubris

5. Frontonasal single; subocular usually bordering the lip; 34-40 scales round middle of body..... Ichnotrophis capensis

   Frontonasal divided into two longitudinally; subocular not reaching lip; 44-58 scales round middle of body .... Ichnotrophis squamulosa

H. KEY TO THE VARANIDAE.

Build robust; nostril an oblique slit, much nearer the eye than the end of the snout ..... Varanus exanthematicus albigularis

Build slender; nostril round, slightly nearer the eye then the end of the snout ..... Varanus niloticus niloticus

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SOME TAXONOMIC AND DISTRIBUTIONAL PROBLEMS PRESENTED BY CENTRAL AFRICAN REPTILES

By

D. G. BROADLEY.

During the preparation of "A Provisional Herpetology of Bechuanaland, Rhodesia, Zambia, Malawi & Mozambique,"(to be completed as a Ph. D. thesis by the end of 1965), the author has found it necessary to review a number of reptile species which present taxonomic or distributional problems. A considerable amount of work has already been carried out on the material in the Umtali Museum, and in many cases it has proved necessary to borrow material from other Museums in Southern Africa in order to get a better overall picture of variation.

A survey of the species involved may be of interest to members and will spotlight the areas from which material is needed.

1. Pachydactylus capensis. Three races have been recorded in Rhodesia. P. c. tigrinus is restricted to the Limpopo Basin, while P. c affinis (including P. c. rhodesianus Loveridge) has a wide range, but is absent from the north-west. Both forms live in rock crevices and affinis is very gregarious. The other subspecies is P. c. oshaughnessyi, with a distinctive pattern of broad cream cross-bands.

This is a rare gecko, but it has a wide distribution and is the only form of P. capensis found in the north-west of Rhodesia, in Zambia (intergrading P. c. katanganus on the Copperbelt) and Malawi (type locality is Cape Maclear). P. c. oshaughnessyi is solitary; I have taken it under quartz boulders and under logs in Kalahari sand (Wankie District) and under a heap of palm fronds (Fort Johnston, Malawi). Although not yet proved to be sympatric with P. c. affinis, the big overlap in distribution records strongly suggests that P. c. oshaughnessyi is specifically distinct. More material is needed, but specimens taken at localities occupied by P. c. affinis are the most urgent requirement.

2. MABUYA LACERTIFORMIS - LONGILOBA GROUP.

The taxonomy of this group of skinks remains far from clear. Mabuya varia longiloba was described from Luderitzbucht, S.W.A. (restricted by Mertens) by Methven & Hewitt in 1914. This was placed in the synonymy of Euprepes damaranus Peters, 1869, by Parker in 1936 and the name Mabuya damarana was still in general use when FitzSimons "Lizards of South Africa" appeared in 1943. I found that Rhodesian specimens had a much higher midbody scale count than those from S. W. A., Cape Province and the Transvaal and separated them as Mabuya damarana rhodesiana in 1960. I had not at that time seen I [illegible] Mertens' papers of 1954 and 1955, in which he pointed out that M. damarana was a synonym of M. varia. He divided M. damarana of FitzSimons (1943) into two races - typical M. longiloba on the coast and in the Kalahari and M. l. triebneri around Okahandja and Windhoek.

In 1961 I collected M. longiloba rhodesiana in Wankie District on rock outcrops, but a few miles away in the Wankie National Park, I collected M. l. longiloba under logs on Kalahari sand. The marked difference in habitat preference suggested that these skinks were not conspecific.

Loveridge (1953) had referred some skinks that he collected at Tete and in Malawi to M. lacertiformis described by Peters from Boror in 1854. When Luchi Balarin and I were collecting in the same area in 1962 we got plenty of these skinks and realised that M. lacertiformis of Loveridge was the same thing as M. longiloba rhodesiana Broadley. As this is a strictly rupicolous skink I thought that Peters' form must be different, as there were no rocks at Boror, which is on the Mozambique Plain. I hoped to settle the matter last December, when an Umtali Museum Expedition visited Boror, but there proved to be no suitable habitat for a rupicolous skink within miles of it. Peters' types of lacertiformis cannot at present be found in the Berlin Museum. Peters' description does fit the skink that I have been calling rhodesiana, it seems probable that they are the same thing, but that Peters types came from Tete, not Boror. A large proportion of Peters' collection did come from Tete.

Two skinks in the collection of the Durban Museum, collected by Walter Lawson at Panda, near Inhambane, S. Mozambique, appear to come close to M. longiloba trieberi Mertens of S.W.A. Such a distribution could be explained by an eastward range extension of M. longiloba with the Kalahari sand movement of the Pliocene. I have previously suggested (Unpublished M. Sc. thesis) that the sands reached the east coast at a point corresponding to the present Sabi-Lundi Confluence, drawing this conclusion from present Platysaurus and Cordylus distributions. The sands eroded away by the Sabi and Limpopo systems were deposited at the coast to build up the Mozambique Plain alluvium. As the sand was stripped from most of Southern Rhodesia and the Northern Transvaal, the range of M. longiloba shrank, leaving relict populations. Was M. lacertiformis derived from one of these populations, which adapted itself for life on the rock outcrops exposed by the retreating Kalahari sands?

Specimens of Mabuya lacertiformis and M. longiloba are urgently required, especially from the Limpopo basin, so that the status and distribution of these skinks can be clarified. They appear to be less wary than M. varia and can usually be caught by hand, this is a big advantage with respect to M. lacertiformis, as this small skink is often extensively damaged if shot with .22 dust shot while on a rock.

3. Mabuya striata complex. Although these skinks are so common in East and Central Africa, their systematics are in a chaotic state. There are marked differences between populations in markings and size, but these are not closely correlated with variations in lepidosis. The first problem is to determine the number of species involved.

Montane skinks from the eastern escarpment are very small and dark in colour, with a dorsal pattern of narrow black stripes formed by dark scale edgings, narrow yellow dorso-lateral stripes and the throat marked with dark stripes or mottling. Loveridge (1953) described Mabuya bocagii mlanjensis from a series of these skinks collected on Mlanje Mountain, Malawi, but this form also occurs at Inyanga, Chimanimani Mountains, Transvaal Drakensberg, the Natal midlands and Drakensberg. There are also montane populations in Tanganyika.

The large form found at low altitudes in East Africa, south through Malawi, Mozambique, eastern Rhodesia and Transvaal to Natal, is Mabuya striata striata, described by Peters (1844) from Mozambique Island. This skink has a pair of broad yellow dorso-lateral stripes.

Another large form is found on the plateau, it lacks well defined dorso-lateral stripes, but has a broad black lateral band on at least the anterior half of the body. The correct name for this form is uncertain, Loveridge (1953) referred Tete specimens to Mabuya striata ellenbergeri Chabanaud (described from Lealui, Barotseland). Mertens (1955) referred specimens from S.W.A. to Mabuya striata striata. Hellmich (1957) referred Angola specimens to Mabuya striata angolensis.

Monard (described from Kuvangu, Angola). Laurent (1964) referred Angola specimens to Mabuya striata chimbana Boulenger (described from Rio Chimbana, Angola), regarding ellenbergeri as a synonym of it, but angolensis as a full species.

Mertens (1955) recognises two other races in S. W. A. - M. s. sparsa Mertens and M. s. spilogaster (Peters).

This complex requires revision on a continental basis before names can be applied to the different forms with any degree of confidence.

4. Riopa sundevallii. This fossorial skink is common in Rhodesia, Zambia and Malawi, but the largest specimen recorded measures only 84 mm. from snout to vent and South African specimens are no larger. A series of Riopa collected in Mozambique (mainly from the Oil Pipeline Trench) clearly represent a different form, for they measure 90 to 134 mm. from snout to vent. This giant form has a wide range in East Africa, where it has been known as Riopa sundevallii.

There is a small form in East Africa - Riopa m. modesta, distinguished only by having the supranasal fused with the anterior nasal. However, in the Wankie District of Rhodesia, Riopa sundevallii often has these shields partially or completely fused, sometimes different arrangements occur on opposite sides of the same skink. The few specimens available from Zambia are also variable.

A problem in nomenclature is raised by Smith's type locality for Riopa sundevallii - "Country to the eastward of Cape Colony", which is normally taken to refer to Natal. Unfortunately R. sundevallii has never been collected in Natal since, and its southern limit seems to be in the Transvaal. There is little doubt that the name Riopa sundevallii should be restricted to the smaller form found on the plateau, with modesta perhaps a northern race of it. The next available name for the giant form of East Africa is probably afer Peters, of which topotypes from Mozambique Island have recently been collected.

5. Acontias plumbeus group. Seven races of A. plumbeus are at present recognised, but some of these may be full species. John Visser has sent me a series of A. p. plumbeus from East London, which is very close to the areas occupied by the races gracilicauda, breviceps and tasmani. Systematic collecting in the Eastern Cape Province is needed to establish the relationships of these forms.

In Rhodesia, there is a wide gap in distribution records between Acontias p. broadleyi at Salisbury and A. p. plumbeus in the Burma Valley, Umtali District. At Bulawayo A. p. occidentalis (black above and below) and A. p. broadleyi (olive green to grey above, white below) occur together with little intergradation. This can be explained by the fact that three geological formations meet in this area - granite, schist (the habitats of broadleyi) and Kalahari sand (the habitat of occidentalis).

6. Typhlosaurus lineatus. This limbless skink is common in the Kalahari, but two apparently isolated populations on the periphery of its range are probably subspecifically distinct.

Dick Japp has collected a fine series at Kalabo, Barotseland. These skinks agree with the typical form in the arrangement of head shields and midbody scale count, but are much larger and have fewer longitudinal stripes. It remains to be seen whether the present gap in distribution in N. Bechuanaland and reflects absence of Typhlosaurus or absence of herpetologists!

A single specimen, collected by Dr. C. K. Brain at Malipati Drift on the Nuanetsi River in the Southeastern lowveld of Rhodesia, differs from the typical form in head shield arrangements and midbody scale count. It probably represents a relict population left behind by the receding Kalahari sands. More specimens are urgently needed to establish the status of this form.

7. Cordylus cordylus group. The taxonomy of the forms treated as races of C. cordylus by Loveridge in his "Revision of the Cordylidae" (1944) presents a formidable task to herpetologists attempting to apply a biological species concept to this group. Present records indicate that all these forms are allopatric, so the most urgent need is more material from areas where races meet.

Consideration of the habitats occupied by these lizards suggests that the group may be divided as follows:-

(A). Forms with the head not, or but moderately depressed, which live in hollow trees, under loose bark, etc; this may be called the Cordylus tropidosternum group and includes five forms - rivae (Ethiopia), tropidosternum (Kenya south to Malawi, Rhodesia and Mozambique); angolensis (Angola); jonesii (S.E.Bechuanaland, Rhodesia, Transvaal, S. Mozambique) and tasmani (Eastern Cape Province).

(B). Forms with the head strongly depressed, rupicolous forms. There are five forms - cordylus (Southern Cape Province); pustulatus (S.W.A.); rhodesianus (eastern Rhodesia and adjoining Mozambique); niger (Cape Peninsula) and minor (Matjesfontein, Cape Province). Loveridge (1944) also includes C. lawrenci (Lekkersing, Little, Namaqualand) in this group.

Collecting in Rhodesia has so far produced only one specimen intermediate between tropidosternum and rhodesianus, this was from a hollow tree at Macheke. It may be either an intergrade or a hybrid. A fine tropidosternum was found in the Umtali Museum yard, probably having been imported with hollow logs used in display. This specimen must come from immediately in the vicinity of Umtali, where we also have populations of C. c. rhodesianus on Cecil Kop and the Vumba.

Cordylus specimens are urgently needed from the south-eastern lowveld of Rhodesia, where jonesii and tropidosternum should meet. I cannot distinguish these two forms apart from the larger size of tropidosternum.

John Visser is trying to clarify the position in the Cape Province. I suspect that C. niger is a melanistic species endemic to the Cape Peninsula, and John suggests that C. minor may also be specifically distinct. Only systematic field work can settle these problems.

8. Genus PLATYSAURUS. I hope to revise my "Monographic Study of the Cordylid Lizard Genus Platysaurus" (M. Sc. thesis) for publication in 1966. Several problems cannot be settled without additional material from critical areas.

One of these is the Transvaal, where Platysaurus i. intermedius Matschie is the correct name for the large form found south of the Soutspansberg, which has previously been called P. g. guttatus A. Smith. Re-examination of the type of P. guttatus in the British Museum (NH) showed it to be the small form with a brille in the lower eyelid previously known as P. minor FitzSimons (Broadley 1964). The type male is green with a red tail and appears to come closer to P. m. orientalis of the Drakensberg than to P. m. minor of the Waterberg. The type came from the vicinity of Pala Camp on the Limpopo near the Notwani Confluence, "near the Tropic of Capricorn" according to Smith. No Platysaurus have since been collected in this area and the only other locality for which I have recorded P. g. guttatus is the Soutspansberg just north of Louis Trichardt. Bob Brain had a male from this locality which was bright green with a red tail, unfortunately it got eaten by a Gerrhosaurus while in the live display at the Queen Victoria Museum. I have seen two females of P. minor from the same locality (S.A.M.) which have been provisionally referred to the typical form. Only more area material from the Pala Camp - Soutspansberg area can show whether orientalis of the Drakensberg is distinguishable.

Platysaurus from the Transvaal north of the Drakensberg come closest to P. i. rhodesianus intergrading with the typical form in the north of the Kruger National Park.

Platysaurus fitzsimonsi was described by Loveridge (1944) from a single male. There is a female in the British Museum (NH), collected at the same time as the holotype, from Schoonoord Farm, Sekukuni Mountains, about 35 miles north-west of Lydenburg. This is the only large species of Platysaurus (exceeding 70 mm. from snout to vent) with a brille in the lower eyelid like P. guttatus. A good series of this form is needed to show the amount of intraspecific variation.

The Platysaurus of the Manica Platform show a bewildering mosaic of populations and much work remains to be done in this area. In the north, from Changara to Guro, P. torquatus and P. imperator occur together. Between Guro and Vila Gouveia P. i. subniger occurs, extending south-east to Mphanda Mountain. In the Pungwe Basin P.w. pungweensis replaces subniger, but further south the position becomes extremely complex, with populations of P. i. rhodesianus and P. w. blakei forming a mosaic pattern with no sign of intergradation. Further east, from Vila Pery to Metuchira, occur populations of lizards which resemble pungweensis in size, but duffer from both this form and blakei in the males being black below. One strange feature of these eastern populations is the high percentage with an azygous shield separating the internasals.

Systematic field work is needed to establish the status of these populations. Sympatry between P. torquatus, P. imperator and P. i subniger has previously been established in Mtoko District (Broadley 1962). There are clear signs of intergradation between P. w. pungweensis, P. w. blakei and the Vila Pery - Metuchira populations, all of which have 14-16 longitudinal rows of ventrals: they do not appear to intergrade with neighbouring populations of P. i. subniger and P. i. rhodesianus, which have the ventrals in 18-22 rows. It is difficult to decide whether the pungweensis - blakei group is conspecific with P. wilhelmi, superficially blakei and wilhelmi closely resemble one another.

In the south, systematic collecting may settle the question of whether P. w. wilhelmi is conspecific with P. intermedius. In the Kruger National Park P. i. intermedius occurs in the middle section, with P. w. wilhelmi in the south. P. i. natalensis occurs in Swaziland (S. of Bremersdorp) and north Natal (Louwsberg - Magut), but a little further east, on the escarpment, P. w. wilhelmi occurs from Namaacha to Ubombo. Collections from the eastern border of Swaziland might solve this problem.

9. Nucras intertexta. Three races of this lacertid occur north of the Limpopo. The typical form is found in the southern Kalahari, but in eastern Bechuanaland and most of Rhodesia it is replaced by N. i. holubi, which is longitudinally striped, not spotted like the typical form. N. i. ornata occurs in Mozambique, extending inland up the major river valleys into Malawi, Zambia and Rhodesia. It has reached Livingstone and Wankie District. Its distribution in the south-eastern lowveld of Rhodesia is far from clear, but it has been collected at Birchenough Bridge and near Bikita.

N. i. ornata is a larger form than holubi and lacks the longitudinal stripes of the latter. It is difficult to draw up a key to distinguish holubi and ornata, because so few specimens of the latter are available. A series of N. i. ornata collected in Zululand show

show marked differences in meristic characters from Rhodesian material. Only more material of this handsome lizard can give a clear picture of its range of variation and distribution pattern.

10. NATRICITERES OLIVACEA.

The distribution and variation of the Olive Marsh Snake is extremely interesting, but really needs to be studied on a pan-African basis. Analysis of the variation in dorsal scale counts, shown by the material in the Umtali Museum, suggests that the key for the differentiation of races put forward by Loveridge (1958) is inadequate, being based on the count at midbody. As the 96 specimens examined all show a reduction in scale rows by fusion of rows III and IV (rarely Iv & V) at a point between ventrals 68-101 (49 on one side of a Malawi snake), clearly the counts before and after this reduction are more important than the count at mathematical midbody. The snakes examined fall into two groups if one takes counts on the neck one head length behind the occiput, at midbody, and one head length before the vent.

Group I. Snakes with dorsal scales in 19-19-17 rows, taken to be N. o. olivacea. There appears to be some geographical variation in dorsal scale row reduction point, e.g. 6 Uganda snakes - 79-101; 36 Rhodesian snakes 69-90. Ventral counts are 133-155 for the 68 snakes examined, with no marked sexual dimorphism.

Group 2. Snakes with dorsal scales in 17-17-15 rows, previously referred to N. o. uluguruensis Loveridge. Unfortunately the populations on the Uluguru and Usambara Mountains have dorsals in 19-17-17 rows and, therefore, differ from typical olivacea only in the scale row reduction taking place in advance of midbody. On the other hand, the group 2 snakes differ from the typical form by having two scale rows fewer throughout the length of the body. Two names have been applied to populations of this group, but it looks as if another will be required. Group 2 can be sub-divided as follows:-

(a) N. o. pembana Loveridge from Pemba Island. None examined, but dorsals are in 17-17-15 or 17-15-15 rows. This population has a very low ventral count of 123-128.

(b) Populations in Tanzania (Liwale) and the eastern districts of Rhodesia with dorsals in 17-17-15 rows, ventrals 130-144.

(c) N. o. bipostocularis Broadley. Populations in Zambia (Abercorn area) and Angola. Dorsals in 17-17-15 or 17-15-15 rows (reducing opposite ventrals 64-85), ventrals 130-142 (124 in one Angola snake). This race is characterised by two postoculars instead of the usual three.

(d) Intermediates between (b) and (c) from S.W.Tanzania, N. Mozambique and Malawi. These have dorsals in 17-17-15 rows and ventrals 131-144; the occurrence of two postoculars varies from 33% to 50%.

(e) Two snakes from Nkata Bay, Malawi with dorsals 17-17-15 and 17-15-15 (reduction at ventrals 57-75), dorsals 131-132. These specimens have a white or yellow nuchal collar like the West African species N. variegata and N. fuliginoides. A Ghana specimen of N. variegata differ s from these Nkata Bay snakes only in its dorsal scale formula of 15-15-15, but Bogert gives 17-15-15-15 for a Cameroon snake and Loveridge gives the midbody count as 15 (rarely 13 or 17).

Loveridge called N. o. uluguruensis the Montane Marsh Snake, but the races do not seem to segregate according to altitude. The typical form occurs from sea level to 6,400 feet in Uganda. Group 2 (b) snakes occur at altitudes varying from 2,100 feet (Liwale, Tanzania) to 4,500 feet (Vumba Mountain, Rhodesia). N. o. bipostocularis occurs at 5,300 feet in Zambia and 5,400 in Angola.

So far no populations have been found that are intermediate between Groups 1 and 2. Comparison of adjacent populations shows that the Group 2 snakes are smaller (maximum head + body length 305 mm.) and have lower mean ventral counts than N. o. olivacea (maximum head and body length 460 mm.) More material is needed, but it begins to look as if Group 2 snakes represent a distinct species with several races having relict distributions. The distribution pattern presented presented by typical N. olivacea suggests that this is the second "wave" of a tropical form which is now reproductively isolated from the "first wave" snakes. N. o. olivacea has swept down the Mozambique Plain to Lourenco Marques and penetrated up the Zambezi to occupy most of Zambia and Rhodesia. It is surprising that it has not been recorded in the Limpopo Basin or the Kruger National Park.

11. Philothamnus natalensis. A review of this species confirms that snakes from south Mozambique below 1000 feet differ from those in the Transvaal, Natal and Cape Province in having strongly keeled subcaudals like P. semivariegatus. Unfortunately the two races appear to meet at Durban, which is the type locality for P. natalensis, the type of which is lost! I have only seen two topotypes: one from the Port Elizabeth Museum has keeled subcaudals, but a British Museum specimen in poor condition (catalogued 1858) appears to have smooth subcaudals. Only a series of Durban snakes can settle this problem, but any material from the coastal strip to the north of Durban would be useful.

12. Prosymna sundevallii. When Loveridge revised the genus in 1958, he referred the only specimen of P. sundevallii then known from Rhodesia to the race bivittata of Little Namaqualand and S.W.A. FitzSimons (1962) referred Rhodesian snakes to the typical form because of the lack of records between S. W. A. and Rhodesia. Since then P. s. bivittata has been recorded twice from Bechuanaland, and I am now preparing to review the species, for it appears that some Transvaal snakes with high ventral counts should also be referred to bivittata.

Only seven specimens have been collected in Rhodesia, all in the Bulawayo area, so more material is needed.

13. PSAMMOPHIS SIBILANS COMPLEX. I have drawn attention to the confused systematics of the genus Psammophis before (H. A. R. Journal No. 20, March, 1963, pp. 5-7). A review of Psammophis subtaeniatus is well advanced, the next problem to be tackled is the redifinition of the highveld sibling species sympatric with P. sibilans in Rhodesia and the Transvaal. It is hoped that the dentition will help to separate the morphologically similar forms in this group.

The highveld Psammophis is the form listed by Boulenger (1896) as Psammophis brevirostris. Loveridge (1940) regards P. brevirostris Peters (1881) as a composite of P. sibilans and P. s. subtaeniatus and considers the type locality, Xa Matlale, to be in Mozambique. So far I have been unable to trace this locality, so the correct nomenclature is uncertain. Boulenger lists 8 specimens from Pretoria, Durban, "Natal", Port Elizabeth, "S. Africa", and "Angola", with 153-162 ventrals and 70-95 subcaudals. I have examined six specimens from Umtali, Pretoria, Johannesburg and Namaacha (Mozambique) with 156-165 ventrals and 82-94 subcaudals. Apart from lower average ventral and subcaudal scale counts, brevirostris differs from sibilans in the shape of the head and coloration. Boulenger distinguished the two forms as follows:

> Frontal, in the middle, narrower than the supraocular, preocular narrowly in contact with or separated from, the frontal... sibilans
>
> Frontal, in the middle, nearly as broad as the supraocular; preocular not reaching the frontal ..... brevirostris

Neither character is very reliable and there is great variation in shape and size of head shields. From the material so far examined it appears that the best way of expressing the short snout of brevirostris is by comparing it with the length of the frontal, i.e. -

> Distance from frontal to end of snout equal to, or slightly less than, the length of the frontal ..... sibilans
>
> Distance from the frontal to the end of the snout much less than the length of the frontal ..... brevirostris

P. brevirostris lacks the dark spots or rings on the labials which are characteristic of "southern sibilans". The dorsal markings of brevirostris consist of a broken vertebral line formed of a yellow streak at the base of each scale (a character also found in sibilans). A light dorso-lateral stripe is usually distinguishable (on Rhodesian snakes this is on the fifth row of scales, the southern specimens have it on the fourth row) dorso-lateral stripes are rarely distinguishable on southern sibilans. Typical sibilans of Egypt comes close to brevirostris in coloration, with broad well-defined yellow dorso-lateral stripes and no labial spots. However, it agrees with "southern sibilans" in head shape and shields.

14. APARALIACTUS CAPENSIS. This species is being reviewed at present. It does not seem possible to use ventral counts in the delimitation of races, for these are affected by several factors:
1: there is sexual dimorphism in ventral counts, females averaging about 15 more ventrals than males in the same population.
2: there is a cline from high counts in the west to low counts in the east.
3: Snakes from high altitudes have lower ventral counts than those from low altitudes.
Even where there are no abrupt changes in environment, one finds very high or low counts occurring spasmodically. A series from the Pipeline Trench at Muda-Lemego, on the Mozambique Plain, shows counts of 149-157 for 8 males and 166-172 for 6 females; but a male from Dondo, a few miles further east, has only 132 ventrals, while three females from Inchope a little further west, have counts of 148, 151 and 170! Both Loveridge (1944) and FitzSimons (1962) have tried to separate a western race bocagii on the basis of higher ventral counts, 174-191 according to FitzSimons. Such a key character fails because of sexual dimorphism, e.g. two A. c. punctatolineatus from eastern Bechuanaland have ventrals 160 in the male and 186 in the female! Both Loveridge and FitzSimons have discounted the upper labial formula as a useful taxonomic character in this species, although the Belgians Witte and Laurent have long recognised A. c. punctatolineatus, which has the second and third labials entering the orbit instead of the third and fourth. All 31 specimens that I have examined from Zambia, plus two from Eastern Bechuanaland, are punctatolineatus, which intergrades with typical capensis in the north-west of Rhodesia and in Malawi, probably also in the western Transvaal. There are no records from the Kalahari, only one from northern S. W. A. and about four (including the type of punctatolineatus) from Angola, so what happens in the extreme west is not clear.

15. ELAPSOIDEA SUNDEVALLII. So far there is no sign of intergradation between the three southern forms of Elapsoidea. There is a striking lack of records between North Zululand and Durban, just where one would expect to find intergrades between decosteri and sundevallii. The situation in the Limpopo Basin is very interesting. The western movement of Kalahari sand during the Pliocene accounts for a male E. s. fitzsimonsi with 172 ventrals from the Sabi-Lundi Confluence, but a female from Beitbridge appears to be an intergrade with 149 ventrals. FitzSimons (1962) records decosteri at Messina and the northern end of the Kruger National Park, with fitzsimonsi at Waterpoort. More material from the southeastern lowveld of Rhodesia and adjoining Mozambique is required to clarify the situation.

16. PELUSIOS. Little progress is being made on unravelling the systematics of the Hinged Terrapins of Southern Africa, because very little material is being collected. A review of present records may encourage members to try and fill in some of the yawning gaps in distribution.

Pelusios sinuatus (A. Smith) This is the common terrapin in large rivers and lakes, ranging from Somalia to Natal. It is the larger of the hinged terrapins reaching a length of 383 mm. The serrated posterior border of the carapace and pattern on the plastron (yellow with a sharply defined black angular pattern round the periphery) are good identification characters.

Pelusios nanus Laurent. This is a very small species found in Katanga. There is one record for Zambia, a specimen collected at the Chambeshi-Lukulu Confluence, north of Mpika, by Desmond Vesey-FitzGerald. The largest specimen recorded measures 119 mm. More material from Zambia is required.

Pelusios castaneus (Schweigger). The records for this large species are very scattered. Bill Mitchell collected a series of 9 at Lochinvar on the Kafue Flats. There is one record from Chibotela, Malawi. Several have recently been collected in Salisbury District, and the species occurs in the Umzilizwe River below Mount Silinda. There is one record from near Vila Pery, Mozambique and castaneus occurs on Inhaca Island. The plastron of this species is irregularly suffused with black and yellow. Black predominates in the Lochinvar specimens, while one examined on Inhaca was uniform yellow below.

Pelusios bechuanicus FitzSimons. This large terrapin was described from a subadult collected at Maun, Bechuanaland. Only three additional specimens are known - from the Chobe River, the Upper Zambezi, and one recently recorded from Angola by Laurent (1964). The head of this species is so large that it seems doubtful whether it can be withdrawn into the shell. A good series of this interesting reptile is urgently required.

Pelusios subniger (Lacepede). This is a small terrapin with a wide distribution. In Zambia it has been recorded from the extreme north (Mweru-wa-Ntipa and Abercorn) and the south (Kalomo District, Kariba Lake). In Malawi it is known from the Shire River at Port Herald. In Rhodesia we have it from Ngamo Pan on the borders of Wankie Game Reserve; from Hartley; 10 miles west of Salisbury and the Sabi Experimental Station. In Mozambique it is common in the swamps at Beira and on the Pungwe Flats.

Latest definition of a lizard = A transistorised crocodile.

THE TAXONOMY OF AFRICAN AMPHIBIA.

By

D. G. BROADLEY.

The publication of Dr. J. C. Poynton's "Amphibia of Southern Africa" has at last given the study of this group a solid foundation. Much remains to be done, but it is now possible for field workers to pick out the areas from which material is most needed, e.g. where two closely related forms meet. The status of such taxa can only be definitely established when it is known whether they are sympatric or allopatric and whether intergrades occur.

Dr. Poynton is now turning his attention to Africa north of the Zambezi. He has already worked out a number of collections from the Eastern Province of Zambia, Malawi and north Mozambique. More material is urgently required, especially from Zambia. If all H.A.R. members would make representative collections of their local herpetofauna, our distribution maps would look much more convincing. Many people will preserve anything which they think is rare, which is good, but this often results in the distribution of the rarities being better known than that of the common forms. To zoogeographers the distribution patterns of common widespread forms are usually more important than those of "rarities", which are often local and highly specialised to occupy a peculiar habitat.

THE FOURTH UMTALI MUSEUM EXPEDITION TO MOZAMBIQUE: NOVEMBER - DECEMBER, 1964.

By

D. K. BLAKE.

AIM:

An exploratory trip to the Gorongoza Mountains and Mozambique north of the Zambezi River. With the exception of a few localities on the coast, the herpetofauna of this area was unknown.

PERSONNEL:

D. G. Broadley, Leader of Expedition and Herpetologist.

D. K. Blake, Assistant Herpetologist and Driver.

R. F. Short, Interpreter and Photographer.

Leonard Mutiyeni, Skinner and Camp Guard.

GENERAL ACCOUNT:

Due to a delay in the receipt of our Salvo-condutos, the start of the Expedition was delayed by three days and we finally left Umtali on the 18th November, 1964.

18th November:

We left Umtali at 10 a.m. and had an uneventful journey down the main Umtali/Beira road until we reached Vila Machado, where we turned north towards the Gorongoza Mountains. Don and I were most upset, as all previous expeditions had collected a "D. O. R. " within 10 miles of the Border.

We stopped at the Pungwe River, which is crossed by a temporary floating bridge. There we caught a House Gecko (Hemidactylus mabouia) under some sacking in an old hut. We continued northward, skirting the Gorongoza Game Reserve. Just north of Vila Paiva de Andrada we collected 9 Golden-backed frogs (Hylarana darlingi) an eastern range extension of 80 miles. We reached Gorongoza Mountain in heavy rain at dusk, so prospects for our first night were not too good. Fortunately we met a fellow Rhodesian - Mr. J. H. Wright, who farms on the Mountain and he offered us the use of a rest-hut, which was accepted with alacrity. We did not go out that night, owing to the rain, but I did get a couple of Ptychadena oxyrhynchus in the local water supply.

19th November:

We hoped to find a path through the forest to the summit of Gorongoza Mountain, where there are rock outcrops, but we were unable to find a guide and, as there was rain in the offing, we decided against attempting the mountain on our own. The only specimens taken in the forest were two Arthroleptis x. xenodactyloides.

After lunch Don and I set out for a rocky area on the lower slopes of the mountain. We got Mabuya striata and Gerrhosaurus flavigularis, but missed a large lacertid which ran up a bank and vanished down a hole at the base of a bush. Extensive excavations only produced a large centipede. The elusive lizard may have been a Nucras intertexta ornata.

Don fired at a low-flying buzzard and it landed on a rocky ridge high above us. Thinking that it might be hit I climbed up towards it, only to see the bird fly away. I then spotted a male Cordylus warreni mossambicus in a rock crevice and called Don up with the two foot crowbar. This lizard was easy to see because of his bright orange flanks, but, despite being shot with .22 dust, he eventually eluded us by slipping from one crevice to another. An hour's hard work with the crowbar was, however, rewarded with two adult females. The whole operation was enlivened by a nest of "cocktail" ants which bit us repeatedly, but apparently did not upset the lizards.

20th November:

We left the Mountain just after 8 a.m. and captured a Lygodactylus capensis on the first gate. We inspected a promising rock outcrop at the foot of the Mountain, but saw no Platysaurus, getting only two Ablepharus wahlbergii.

It was a hot, dusty journey to the Zambezi, and the only specimens collected en route were an Agama mossambica on a tree, and a couple of Arthroleptis stenodactylus in a trial pit.

We camped on the banks of the Zambezi at Chemba and Don got Bufo regularis and Ptychadena oxyrhynchus at the water's edge after dark.

21st November:

We made an early start and pushed on 26 miles to Sena, where one can only cross the Zambezi by rail. While waiting for the engine to get up steam, we checked a short trench, which yielded nothing. We took a walk under the bridge and got a Hemidactylus mabouia on one of the piers. We then crossed the river in style, sitting in the Land Rover on an open truck, pushed by a large steam locomotive (Freight charge 331 Escudos = £4.2.9.)

Shortly after leaving Dona Anna, the railway station on the north bank, we hit a terrific bump. A check up showed that one of our two 4-gallon "Jerry cans" of water, in racks on the front bumper, had broken loose and we had driven over it. This meant that we were reduced to only 4 gallons of water for "dry camps".

The 18 miles between the Zambezi and Shire Rivers is dead flat and consists of black cotton soil. The prospects of having to recross this after the rains had broken was not pleasant.

We crossed the Shire on a hand-operated pontoon, and while waiting for it we searched for Vipera superciliaris without success.

We continued northwards and decided to detour to Morrumbala town in order to fill up with petrol. After sitting around for three hours waiting for the local garage proprietor to finish his siesta, we eventually refuéled. While turning the Land Rover I found a dead Spitting Cobra (Naja nigricollis mossambica) had been lying in the road nearby the whole time. Don salvaged the odiferous corpse and preserved the head after taking scale counts.

On the way back to the main road we checked over a small rock outcrop and I soon spotted Platysaurus. These proved to be P. torquatus, but the females lacked the striking blue tails of those found south of the Zambezi, and the light longitudinal stripes were broken up into lines of spots. As a new subspecies seemed likely, we decided to spend the night nearby, for it was getting late. While

P. maculatus lineatus

we unpacked we were invaded by bees looking for moisture (the country was very dry). Everything wet attracted them, including cups of hot tea. As it was very hot we did not bother with the tent. At 10 p.m. the rain reached us and we hurriedly erected the tent in the dark, whereupon the rain stopped!

22nd November:

We rose early in an attempt to avoid the bees, but they were up earlier! We got a good series of Platysaurus, plus Agama kirkii and Mabuya quinquetaeniata obsti.

We rejoined the main road and headed north. No reptiles of interest were seen, but a couple of Warthog and a Bushy-tailed Mongoose (Bdeogale) were seen crossing the road. We stopped to inspect a small kopje, but were repulsed by a swarm of bees, after collecting two Mabuya quinquetaeniata.

Metolola proved to be a "ghost town", which apparently served an abandoned tea estate. We drove up a spur of Derre Mountain and found a derelict mansion on the summit; this yielded three Hemidactylus mabouia.

We could now see our next objective - Chiperone Mountain. The summit of this mountain seems to gather mist, which then drifts across into Malawi, giving drizzle or "Chiperone" weather, particularly in the Cholo area. The road does not pass very close to the mountain and we were unable to find a camp site with water until we reached the Luala River. In any case, Chiperone was not a practical proposition, as it is heavily forested and surrounded by a thick belt of bamboo, so would require a full-scale expedition to itself.

23rd November:

The day dawned overcast, with drizzle. Don and I decided to check a kopje for Platysaurus. After an hour of zig-zagging through the bush we eventually found the hill in the mist. While climbing it we were treated to some heavy rain. The only lizards seen were Agama kirkii. On the way back to camp we collected a few Phrynobatrachus u. mababiensis hopping across the path, and got Hemisus marmoratum and Phrynomerus bifasciatus under logs.

24th November:

We set off north again and met the main Mlanje - Quelimane road after nine miles; we then turned east. After another 10 miles we stopped to see what we could find. The country was heavily wooded with virtually no undergrowth and the substrate was sand, promising amphisbaenids. Much log turning and digging in banks proved fruitless.

We checked a couple of granite outcrops, but only single specimens of Hemidactylus mabouia and Mabuya quinquetaeniata were taken. Although no Platysaurus were seen, the overcast weather would not encourage them to venture into the open, so they may be present.

We turned off the main road and travelled north through Mocuba, the first sizeable town since Morrumbala. Just after Mocuba I saw a large green snake cross the road and go over a bridge embankment. Despite a "hurried stop", we could not find it.

Some 15 miles further on, at Mugeba, we got two nice D.O.R.s within 50 yards, an Atractaspis bibronii and a huge Elapsoides s. decosteri.

We set up camp on the road leading down to an old bridge site. While clearing the site of fallen Mango leaves, Roy uncovered a young Crotaphopeltis h. hotamboeia, which made threatening gestures until it was dropped into a bottle of alcohol. These dead Mango leaves also yielded a Bufo taitanus beiranus and a series of Arthroleptis x. xenodactyloides. Don worked along the stream that evening and got Phrynobatrachus natalensis Rana angolensis and Ptychadena anchietae.

25th November:

We pressed on towards Vila Junqueiro, passing through some very tempting granite kopjes. Near Erego we stopped for Don to shoot an Agama mossambica, and at the same spot he found a dead Causus defilippi with a Breviceps mossambicus inside it.

The Namuli Peaks proved a big disappointment - they are great domes of bare granite, the lower slopes being completely covered with tea plantations. There are a few tiny patches of forest in the higher kloofs on the mountain. We checked over a trench running through Vila Junqueiro, getting Agama mossambicus, Ablepharus wahlbergii, Mabuya varia and Breviceps mossambicus.

In view of the lack of camping facilities around Namuli, we pushed on northwards, looking for a suitable site. After 22 miles we checked a granite face and got Platysaurus torquatus subsp. and Mabuya quinquetaeniata. We pressed on, looking for a suitable camp site with water. We hit the railway line at Mutuali and took the road west for Nova Freixo. We soon came to two derelict railway houses and decided to camp on the verandah of one for the night. While having a meal, we were entertained by a squad of geckos (Hemidactylus mabouia and Pachydactylus bibronii) which fed on the insects attracted by our lamp

26th November:

In the morning, while Leonard was packing the Land Rover, we checked around the house and the adjoining siding. Here we got an Agama hispida, a Mabuya varia and a Lygodactylus capensis. When we resumed our journey we found that we had camped only half a mile from the Lurio River.

After refueling at Nova Freixo we turned north and visited the Mission at the foot of Mitacue Mountain. We were kindly received and given a guide to take us up to a camp site at the dam on the mountainside, which supplied Nova Freixo with water. Through a slight misunderstanding we camped at the filtration plant instead.

Within a few minutes of our arrival Don caught a Bufo taitanus beiranus and a pre-lunch survey of the area below the dam indicated that Platysaurus torquatus subsp. was plentiful. The edge of the dam was spotted with the white foam nests of Chiromantis xerampelina and we soon collected a few of these frogs. On the way back to camp our guide lagged behind, then came up with a young Vine Snake (Thelotornis kirtlandii capensis) held at the end of a stick by a strip of bark. We had hardly bagged it when he pointed out another.

That afternoon we bathed in the stream and sorted out our kit. After dinner Don and I went up to the dam and collected Xenopus laevis, Bufo regularis, B. pusillus, Ptychadena oxyrhynchus and P. anchietae.

27th November:

The high peaks of Mitacue Mountain (5,400 ft.) are bare granite, the lower slopes are covered with open woodland with little undergrowth.

Our guide from the Mission arrived early and at the same time it began to drizzle. We set off up past the dam, collecting Platysaurus as we went. From a col between two peaks we looked down into a "hidden valley" in the heart of the mountain. This area was being cultivated by the local Africans and we made our way down to their huts as it began to rain in earnest. After half an hous it let up enough for us to start collecting in the immediate vicinity, but we only got Hemidactylus mabouia, Pachydactylus bibronii, Agama kirkii and Mabuya varia under rocks.

The rain now came down in buckets and, after sheltering in the village for most of the morning, we made our way back to camp. After climbing so far, it was disappointing not to reach the summit, where such montane relics as Lygodactylus bonsi, Scelotes arnoldi mlanjensis and Nothophryne broadleyi might be expected to occur. On the return journey we got a couple of Breviceps mossambicus on the path, and Don caught a Typhlops roncdensis under a log. This attenuated species had only previously been recorded from south Tanganyika. Our guide pointed out three Thelotornis. All the Vine Snakes collected had full stomachs - one containing a lizard (Agama kirkii), and the others frogs (Arthroleptis stenodactylus and A. x. xenodactyluides).

After getting back to camp, Don decided to build up his series of Platysaurus torquatus subsp. with the idea of making Mitacue the type locality. While negotiating a steep rock face he ran out of footholds and had to "make like a leech" to get out of trouble. In the process his revolver slipped out of its holster and bounced down the rock for 100 feet, whereupon he nearly followed it!

28th November:

While the Land Rover was being packed I took a stroll and got another Bufo t. beiramus. On the way back to Nova Freixo we picked up a fresh D.O.R. young Rufus Beaked Snake (Rhamphiophis o. rostratus). Deciding to do some sight-seeing, we climbed a small hill with a chapel perched on the top, on the steps I got another Bufo t. beiramus.

Shortly after leaving Nova Freixo we spotted a big Rhamphiophis o. rostratus crossing the road and this was soon bagged. A little further on I saw a Leguaan cros the road. We thought that he would head for a big termitarium nearby, but a search revealed nothing. Then I spotted him lying "doggo" in the open, just off the road. He made no effort to escape and when picked up was found to be in very poor condition, having presumably just emerged from hibernation. Don later identified him as Varanus exanthematicus ionidesi, recently described from S. Tanganyika by Laurent. We inspected a Baobab near Mutuali and got a couple of large Hemidactylus mabouia.

The scenery between Mutuali and Ribaue was most striking, with huge granite inselbergs rising out of a level plain. Many of these outcrops are almost sheer, others actually overhang on one side, like a dragon's tooth. Many of these peaks have isolated patches of forest on the summit and the topography certainly favours the survival of relict forms.

At dusk we pitched camp by a stream on the lower slopes of Ribaue Mountain (5,300 ft.), and at the same time the rains broke. After the rain had stopped, Don walked down to a derelict swimming pool and picnic spot which we had passed. He caught Chiromantis xerampelina Ptychadena anchietae in the swimming pool and, after much searching, managed to get one of the few Leptopelis concolor which were calling.

29th November:

Just below our camp a new reservoir was under construction, with a trench leading down to the town of Ribaue. After an early breakfast, Don and I set off down this trench with high hopes after the rain. We started off with two Causus defilippii in the first few hundred yards, but the only other snake seen was a Boomslang (Dispholidus t. typus). which evaded us by diving down a termitarium.

On our return to camp Roy joined us and we set off to walk up the road which continued beyond our camp site. The first specimen was a Ptychadena c. guibei in dead leaves by the side of the path, surprising, as this species usually lives in vleis. We soon reached a shrine, but the road went on. A landslide had cut the road for a 50 yard stretch, but we climbed over it and continued until the road petered out near the summit of the mountain. The bridges and culverts were well built of dressed stone without mortar, and the lower side of the road was supported by a similar dry stone wall. It was thus surprising to find that the road didn't go anywhere!

Under a plank by the roadside near the summit I found a Nothophryne broadleyi, and after much searching I got another hopping around in the grass. None of these frogs were found on the local granite outcrops (the habitat where Don got the type series on Mlanje Mountain), so it seems that the species was just emerging from hibernation. This new record suggests that Nothophryne occurs on many of the huge granite inselbergs which are scattered across the Niassa Platform.

30th November:

We set out for the coast, checking rock outcrops en route and getting Platysaurus torquatus subsp. on them, until we ran out of kopjes 30 miles east of Nampula. These last specimens extended the range of the genus to the east by 250 miles from Mlanje Mountain (P. mitchelli).

Nampula is the capital city of northern Mozambique. It is an impressive city, bustling with activity and with many fine new buildings. From here to Monapo we travelled on a tarmac road for the first time since leaving Vila Machado. Shortly after leaving the tar we got our first Chamaeleo dilepis crossing the road, and just before Mossuril we got a Rhamphiophis o. rostratus D. O. R.

We finally hit the coast at Mossuril and set up camp on the Cabaceira Peninsula some 8 miles beyond it. The camp was in a grove of coconut palms, on a ridge, with the sea to the north and a mangrove swamp to the south.

1st December:

After an early breakfast, Don and I set off along the beach to a large area of coral rag which we had seen the previous evening. Here we found plenty of Coral Rag Skinks (Ablepharus boutonii africanus) basking on the rock. These bronze skinks move up and down the rag with the tide, presumably eating small insects attracted by the rotting seweed and other debris.

The first two specimens were shot, but were badly damaged by splintered rock fragments, so we collected a further 14 specimens by hand. They can have few predators, for they are very reluctant to take refuge in the many crevices in the rag and soon emerge when they are forced to take cover.

In the afternoon we travelled to Mossuril and back, collecting en route. The whole area was very dry and the only frogs we could find were some Xenopus muelleri in a well. By turning over palm fronds and logs, we got a few common lizards, i.e. Hemidactylus mabouia, Lygodactylus grotei, Agama mossambica, Mabuya striata, M. varia, Riopa afer and Ablepharus wahlbergii. There was no sign of the two fossorial skinks which Don particularly wanted from the area - Scelotes aeneus and Scolecoseps boulengeri.

2nd December:

We decided to have a day off, relaxing by the sea, but Don and I spent the whole morning exploring the coral reef at low tide, finding many varied and colourful forms of marine life in the pools. Don satisfied one of his ambitions by catching an octopus - even if it was only an inch long ! I think that my herpetology would suffer greatly if I ever lived near a coral reef.

About midnight the local rains broke with a terrific storm, which had us holding the tent down. Don's fears of coconuts crashing through the tent like bombs were not realised, much to our relief!

3rd December:

We made an early start on the 20 mile drive to Lumbo, where we intended to take the ferry to Mozambique Island. Just past Mossuril the road was completely blocked by three trucks: one had broken down in the middle of the road and the others had got stuck while trying to pass on either side.

We turned back and did some collecting alongside the road. Don found that a few Ptychadena were lurking in the vleis and managed to catch one huge P. vernayi and a P. c. guibei. Meanwhile, I was stripping the outer leaves off banana plants, which yielded a Phrynomerus b. bifasciatus, 4 Afrixalus b. brachycnemis and 7 Lygodactylus grotei.

Shortly after this the road was cleared and we continued our journey to Lumbo. At the entrance to the town we spotted a House Snake (Boaedon f. fulignosus) D.O.R. Having neglected to bring any formalin with us we dropped it in the back of the Land Rover.

Lumbo is very small, little more than a railhead, and very much a satellite of Mozambique Island, which lies 3 miles offshore. Mozambique was the capital of the province from 1558 until 1898 and is, therefore, almost completely built up. We were anxious to collect material on the island because Peters had described several reptiles and amphibians from this locality in 1854.

The ferry, operated by C. F. M. (Mozambique Railways) left for the Island soon after our arrival. As soon as we had landed, we began searching for open spaces that might harbour reptiles. We soon found a public park near Fort Sao Sabastiao.

Whilst scrutinizing the trees for lizards, I was approached by a schoolboy, who asked what we were looking for. I explained, and he shot off, to reappear shortly with a plump Breviceps mossambicus and enquire whether we wanted these. This was a topotype, so I acknowledged that we did, with the result that we soon had a party of a dozen school children combing the park for specimens. The previous night's rain had brought all the Breviceps to the surface and we soon had a series of 28. We then turned out attention to lizards. We soon got a couple of topotypic Mabuya striata and a Hemidactylus mabouia. While Don was trying to catch another House Gecko, I spotted a beautiful emerald green gecko on a higher branch. This was clearly a Phelsuma, a genus of geckos found on Madagascar, which had not been recorded from Mozambique Island. Another was seen high up in a neighbouring tree, but neither specimen was accessible.

Poking around the bases of clumps of vegetation and in debris produced 4 topotypic Riopa afer. After getting a couple more Mabuya striata, the children pointed out to me a Phelsuma on the railing surrounding the park, and I quickly captured him. These are, no doubt, the most colourful of the geckos, being emerald green with orange markings on the snout and purple brown spots on the back. Don subsequently identified them as Phelsuma d. dubia, which occurs on the coast of Tanzania. We got a couple of Mabuya varia, one being devoid of markings.

After a sight-seeing tour of the fort, we collected a few Ablepharus boutonii africanus on the coral rag at the foot of the outer walls. Here I spotted a large Conger Eel, something we had not contemplated while exploring the reef on the previous day.

While looking for somewhere to have lunch, Don spotted a large Boaedon f. fuliginosus lying dead in the narrow street. After a good lunch, we examined another small park, without success. We returned to our original park and managed to catch another Phelsuma.

We took the last ferry boat back to the mainland and reached camp at dusk. As the Lumbo D.O.R. was by now extremely decomposed, Don threw it away. As it landed I shone the torch in that direction and spotted another snake slithering away. It was soon captured and proved to be a large Lycophidion semianmule. So closed our most successful day.

4th December:

We reluctantly took our leave of the Cabaceira Peninsula and made our way back to Nampula. The day was hot and as we sped along Don dozed. Suddenly he shouted D.O.R and I brought the vehicle to an abrupt halt. This turned out to be a mirage, but shortly after this another cry from him produced a flattened Psammophis s. sudanensis.

While waiting for our gas cylinders to be refilled in Nampula, we got a good series of Lygodactylus grotei on the trees lining the streets. We found the Nampula Museum and, while waiting for it to re-open after the lunch break, we explored a patch of swampy ground behind it.

We promptly missed a Psammophis sibilans, which was also looking for frogs. I examined a clump of Bananas and got both Afrixalus b. brachycnemis and A. f. fornasinii. Meanwhile Don had collected a few of the ubiquitous Phrynobatrachus acridoides and was chasing Ptychadenas. We eventually got a P. oxyrhynchus and 9 P. taenioscelis.

That evening we set up camp on the Nadaunama River next to a series of dams, about 20 miles from Nampula. Once again the first specimen taken was a Crotaphopeltis h. hotamboeia. After dinner Don and I went out to collect some of the Hyperolius that we could hear calling. After half an hour of precarious balancing on river banks we got H. tuberilinguis and Don collected a sleeping Western Green Snake (Philothamnus i. irregularis)in the reeds. The only other frogs found round the dam were the inevitable Bufo regularis, B. pusillus, Ptychadena oxyrhynchus, P. anchietae and Phrynobatrachus acridoides.

While on the way back to camp I stepped into a six-foot hole and vanished from sight; fortunately I was unhurt. As we reached camp it started to rain and we got soaked while putting the tent up. Roy Short was already in bed and asleep, so was not amused.

5th December:

We worked upstream to the largest dam in the morning, but only got a Hemisus m. marmoratum and 2 Riopa afer under logs and 2 small bats (Pipistrellus sp.) in rolled Banana leaves.

We resumed our journey through undulating country with big granite kopjes to the westward. After 12 miles we stopped to check a small stream. Don shot a Hemidactylus mabouia on the bridge and flushed a Mabuya which was perched in a tuft of grass basking. He could not find the skink, but as he thought it was a Mabuya m. boulengeri, he decided to lie in ambush for it. After ten minutes it emerged and was shot. This was the only boulengeri taken on the expedition.

We were held up for a while at Murrupula where the local Administrator made a meticulous check of all our documents.

Just west of Alto Ligonha we checked a large granite face close to the road and got Platysaurus torquatus subsp. once more. We pressed on through well-wooded country to Alto Molocue, where we refueled in the rain. We turned south, stopping for a Spitting Cobra D.O.R., and finally set up camp on a small river at Chapala 27 miles beyond Alto Molocue. This river is quite wide at the bridge and flows over granite

on the downstream side. Upstream it divides into several channels with deep pools overhung with palms and other trees. Near our camp on the south bank were the remains of an old water mill.

That evening a fair variety of frogs were calling. Some Kassina senegalensis were collected in the vlei across the road from camp, but it took some time to find one of the few Leptopelis concolor which were calling in this area. Don put on his waders to collect upstream from the bridge, while I assisted from the bank until my torch "died" and I retired.

Don concentrated on the Hyperolius at first. H. tuberilinguis was most plentiful, but he also got 2 H. nasutus and 2 H. marmoratus albofasciatus, the highland race found in Malawi, which was new for Mozambique. He caught a single H. pusillus, only to lose it while putting it into the plastic bag - this was the only one seen on this expedition. Moving along to some isolated pools Don heard the staccato "machine-gun" call of Afrixalus f. fornasinii, which he soon collected. At the same place he heard an unfamiliar "meow-meow-meow" call. Tracking it down he collected a small Leptopelis with broken up dorsal markings, and diligent searching produced two more. When about to turn back, he spotted a dwarf chameleon in the beam of his headlamp. It was on grass only an inch off the ground and proved to be a Brookesia brachyura ionidesi, a form new to Mozambique.

6th December:

Although we were tempted to spend another day at Chapala, we were anxious to get to grips with the rich amphibian fauna of the Boror swamps, so we pushed on.

At the junction with the Mocuba-Vila Junqueiro road we checked a small rock outcrop and got a single female Platysaurus, differing from those previously collected in having continuous dorsal stripes. We were unable to find a male. Just north of Mocuba we got an Elapsoides s. decosteri D.O.R.

At Mocuba we visited the local cemetery and saw some very interesting family vaults, which yielded several Lygodactylus capensis. Sixteen miles south-east of Mocuba, we checked over a rocky river bed, which proved to be swarming with Gerrhosaurus v. validus. We collected three, then got five Platysaurus torquatus subsp., all females. We then spotted a Psammophis s. sudenensis with a frog in its mouth. I headed it off, but on spotting Don it dropped the frog and dived into a hole. We recovered the frog, a Ptychadena anchietae.

Shortly after this we left the granite and passed into flatter country. Just north of Namacurra we picked up a Psammophis sibilans D.O.R. We found ourselves on a good tarred road from Namacurra to Quelimane and passed through some nice forest patches until we reached

Nicuadala. From here it was dead flat swampland for miles. This was our goal - Boror, from where Peters had described a string of amphibians. Our luck was out, for the swamps were bone dry and burnt off. Any amphibians were obviously several feet down, hibernating in the deep cracks in the mud.

As there were no suitable camp sites, we pushed on to Quelimane, then on to the coast at Palane. We passed through miles of Coconut plantations and it was dark before we set up camp in a beach hut.

7th December:

Our hut yielded a Lygodactylus capensis and on the way back to Quelimane we got a Phrynobatrachus acridoides in a fresh water dam in the middle of the mangrove marshes.

Boulenger (1885) recorded Phelsuma from Quelimane, but, although we searched diligently in the vicinity of the docks, we failed to see any. It is possible that the colony has been wiped out during dockyard extensions. We saw some Hemidactylus mabouia and Gerrhosaurus flavigularis, but these eluded us. Don got one Lygodactylus capensis. After lunch we left Quelimane for the Boror swamps. We stopped at Bico, a brick and ceramics factory sixteen miles from Quelimane. The clay pits yielded nothing, but on the way back to our vehicle we stumbled across a couple of waterholes. I climbed down and got a few frogs - Bufo regularis, Ptychadena oxyrhynchus, P. floweri and Phrynobatrachus acridoides. We crossed the road and checked several other holes without success. The local villagers had started a grass fire. I strolled over in time to see a small Varanus niloticus dash out of the fire and into a small pool at the edge of a dried up pan. I caught it and also several Xenopus muelleri, much to the delight of my audience. With a cheerful wave to them, I jumped down onto the pan and promptly sank through the crust and up to my knees in mud !!!

We left the swamps and set up camp five miles north of Nicuadala, beside a promising stream. The riverine vegetation included a peculiar palm tree with branching "mangrove type" roots covered in sharp spines, As it was a beautiful evening we again dispensed with the tent and after an early supper Don and I set off to collect frogs.

We started off with Leptopelis concolor, which were hard to find, being in long grass away from the stream. I found one sitting on the ground. On the reeds along the stream we got Hyperolius tuberilinguis and Afrixalus f. fornasinii and we got several more of the "meow-meow-meow" Leptopelis which Don had collected at Chapala. One or two Leptopelis flavomaculatus were calling, but it took us a long time to locate one, which was about 15 feet up in one of the spiny palm trees. Don shied a piece of wood at it and knocked it down. We caught the frog when it began calling again from a low level after a few minutes.

Our arrival back in camp was again the signal for it to start raining, so once more we practised our skill at erecting tents in the dark!

8th December:

We returned to Nicuadala and took the road west for Morrumbala, passing through patches of lowland forest. A check of a rock outcrop east of Morrumbala failed to yield any Platysaurus.

Just west of Morrumbala, near our "Bee" camp, we got a Bitis a.arietans D.O.R. Don checked a roadside trial pit and got a Hemidactylus mabouia and a young Boaedon f. fuliginosus.

We set up camp in a grove of Mango trees on the banks of the Shire River at the foot of Morrumbala Mountain (3,500 ft.) about a mile east of Vila Bocage. We offered the local villagers a reward for any reptiles brought in or any report leading to the capture of a snake. Our own investigations produced a Gerrhosaurus flavigularis and single specimens of Afrixalus f. fornasinii and Hyperolius tuberilinguis in Bananas. We examined a small stream that evening and got some Xenopus muelleri, the only frogs calling were Leptopelis concolor, which we collected on tall reeds away from the river, one was clinging to a Banana stem. We did not fancy poking around in the reedbeds bordering the Shire, which is full of Hippo and Crocodiles.

9th December:

As usual our arrival had produced the first rain of the season and it was still raining when our guides for the ascent of the mountain arrived. Our camp was about 150 feet above sea level, so we faced a climb of about 3,300 feet to the summit of Morrumbala. As our mountain climbing efforts had been thwarted so often on this expedition, we were determined to get to the top of this one! By 9 a.m. the rain had eased enough for us to start, at least it lowered the temperature a bit. The initial climb is fairly gentle, but it rapidly becomes steeper. In this open woodland we got several Arthroleptis stenodactylus, but the most interesting captures were some large crabs which live under rocks. They look more like marine crabs than the freshwater form.

As we neared the top it began to drizzle and we were soon soaked. In the grassland on the summit we could hear Breviceps mossambicus calling all around us. I eventually caught one on the path.

Scattered rock outcrops on the mountain top yielded a couple of Hemidactylus mabuya and a few Mabuya quinquetaeniata were seen. In a nice patch of forest we collected a few Arthroleptis x. xenodactyloides. There were wet open rock faces that looked suitable breeding grounds for small toads like Bufo vertebralis and B. gariepensis, but all we got was a solitary Bufo regularis. After about an hour on the summit we descended.

That afternoon Don explored the lagoons upstream for Vipera superciliaris, but there was little hope of catching anything in the thick vegetation. On the way back to camp he was picked up by the local Chief of Police, supported by a jeepload of fully armed soldiers, who were on their way to find out what we were up to! We produced our documents and soon convinced them that we were not Frelimo terrorists.

Early next morning an African arrived on his bicycle and informed us that there was a snake in his hut. This proved to be a young House Snake. The only specimen brought in by the local populace was a Chamaeleo dilepis.

By 8 a.m. we were at the Shire Ferry and here we sat all morning while two big trucks ahead of us were unloaded, ferried across, and reloaded. Don looked for specimens, but got only a Hemidactylus mabouia on a gauging tower. We watched the huge islands of sudd floating down the Shire and wondered if any Vipera superciliaris were on board.

Just after noon we finally crossed the Shire and continued to Dona Anna. Fortunately the road had had little rain and was still passable. We had a short wait for the train to take us across the Zambezi, so we examined the local sandstone outcrops. We saw Gerrhosaurus v. validus and Mabuya q. obsti, but no Platysaurus.

From Sena we took the Beira Road and pushed on to the Zangara River at Vila Fontes, which we crossed by pontoon. We had hardly got the tent up when the rain came down in buckets and we had a stream flowing through the tent. Don found a bullfrog (Pyxicephalus adspersus) hopping around the camp.

As soon as the rain stopped Don and I proceeded to the river, capturing several migrating Xenopus muelleri in pools on the road. The river seemed to be largely full of Phrynobatrachus acridoides, but we eventually got a Leptopelis concolor in long grass.

11th December:

Next morning the road was still awash from the previous night's storm. We stopped several times in the heavy forest near Inhamitanga, but our search was fruitless. A banana grove by a stream did yield Afrixalus f. fornasinii, Hylambates maculatus and Leptopelis concolor, the latter had not previously been found hiding in bananas. The only specimens found on the road were a Chamaeleo dilepis and a Crotaphopeltis H. hotamboeia D. O. R.

We made camp about 10 miles north of Dondo by a very attractive stream. We went out after supper for frogs, but the only Hyperolius calling was the inevitable tuberilinguis. All three species of Leptopelis were calling, so we concentrated on these. I found a small

bright green specimen low down, which foxed us until Don realised that it was a juvenile L. flavomaculatus, which looks very different from the adult. I eventually retired to bed, but Don went out again to boost the series, which finally totalled 3 L. flavomaculatus, 3 L. concolor and 9 Leptopelis sp. ("meow-meow-meow").

12th December:

The next morning we set off for Umtali and soon picked up a Hinged Tortoise (Kinyxs b. belliana) crossing the road. This was followed by a Terrapin (Pelusios subniger) on the road across the Pungwe Flats. We also got a few snakes D. O. R., an Atractaspis bibronii and a Mehelya c. capensis on the Pungwe Flats, and a Typhlops s. mucruso at Maforga.

CONCLUSION:

As a survey the trip was highly successful - giving a good indication of areas that need more thorough coverage in the future.

From the collecting point of view the expedition was less successful, and this was basically due to two factors.

The first was the drought conditions which prevailed in many areas. We could have gone into Mozambique later in the season, but many of the roads would then probably be impassable and the rivers uncrossable.

The other factor was that we covered 2617 miles in 24 days, and this meant that we could not spend more than a few days in any one area. When breaking new ground it is difficult to forecast which areas are going to repay investigation. As it turned out we got little material in the areas collected by Peters early last century (with the notable exception of Mozambique Island), due to lack of rain. So much of the time spent on the coast would have been better employed on the Niassa Platform. The summits of the huge inselbergs will certainly require careful examination in the future.

PHILATELIC HERPETOLOGY

The Black-necked Spitting Cobra (Naja nigricollis) is depicted on a diamond shaped 20 Escudo stamp issued by Portuguese Guinea. This is very appropriate, for the type locality for this species is "Guinea".

A Check list of the stamps depicting herpetological subjects (over 80) is being compiled by Marvin L. Skaroff for publication in the P. H. S. Bulletin - condensed from the Bulletin of the Philadelphia Herpetological Society, Vol. 11, No. 3-4, p. 52 (December, 1963).

A BITE BY A BURROWING ADDER, Atractaspis bibronii.

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The Zanzibar Burrowing Adder, Atractaspis bibronii rostrata Gunther, is rarely seen in Nyasaland and then only during the wet season. It has not been previously recorded from the Northern Region although several specimens have been taken from the Southern and Central Regions (Loveridge, 1953; Sweeney, 1961). It is thought to be nocturnal (Broadley, 1963b) although the following account shows that it is sometimes active during the day. Broadley (1963a) reports finding a specimen with 21 scale rows by the Shire River Bridge near the Mozambique border. Evidently it belongs to the more southern form Atractaspis b. bibronii A. Smith, thought to occur south of the Zambesi River.

Perhaps the most notable thing about this small snake, which rarely reaches two feet in length, is the extremely long fangs and the unique way it uses them (Rose, 1962). Doubtless several people not acquainted with this specialization have been bitten. There are records of bites with varying local effects (Sweeney, 1961). There are relatively few detailed reports of snakebite cases in the literature; we present the following account for the benefit of those not familiar with the protective behaviour of the snake or the effects of its venom. Perhaps someone will benefit from our mistakes!

During a nine-month period of field studies (October, 1963 through June, 1964) in the Northern Region of Nyasaland, in Rumpi and on the Nyika Plateau, we encountered only one burrowing adder; February 22, 1964. It was found in Rumpi, by the children next door, as it crawled across their cleanly-swept yard in semi-shade at 2:40 p.m.

Details of the specimen, a male, are as follows. Dorsal color glossy blue-black; venter appears finely banded in dark and light due to a light border to each ventral scale. Total length: 515 mm. (20 inches); tail length: 28 mm.; snout-vent length: 487 mm.; mid-body scale rows: 23; ventral scales: 246; subcaudals: 1 pair + 20 singles; eyes 1 mm. diameter; length of fangs: 5 mm.; mouth opening 10 mm.; length of head: 15 mm. Hence the fangs are half the length of the mouth opening and one third the length of the head. In the intestine were the macerated remains of three baby rats, only lightly furred.

My husband, Professor Paul C. Lemon, attempted to capture the snake mistaking it for a harmless glossy burrowing snake. He was holding its head to the ground with thumb and forefinger of the left hand when he saw the jaws move from side to side and fangs emerge. Instantly he released the snake, but by then he had been bitten. He neither saw nor felt the bite.

There was a full-sized replacement fang lying adjacent to the left functional tooth. Evidently these two teeth entered his left forefinger alongside the nail. The teeth must have penetrated deeply for the wound bled freely. We wondered whether the replacement at this stage could also carry venom thereby giving a double dose. The clever way this snake can independently erect its fangs and use only one side without obviously opening its mouth has been observed by Ionides (Rose, 1962). It comes as quite a surprise to those unfamiliar with this behavior.

About 30 seconds after the bite a burning pain was felt in the finger and within half an hour had passed to the next finger. A hypersensitivity quickly developed in the bitten finger; this too spread to the adjacent finger, back of the hand and by 7:00 p.m. to the mid-forearm. Pain in the finger became more intense throughout the evening. An aching developed under the upper arm in about three hours. All pain was restricted to the hand and arm, being most intense in the finger.

The wound was cleaned immediately with water, then iodine, and bleeding was encouraged. Tourniquets were applied to the finger and arm until serum could be injected. After that time a tourniquet was applied just below the elbow. This was released at intervals of one-half hour for one hour, then every 10 minutes until it was removed after 1½ hours. About 20 minutes after the bite (during which time the snake was killed and identified) one ampoule of polyvalent tropical anti-snakebite serum was injected subcutaneously into the disinfected forearm. Some was lost by cracking of the ampoule, so about 5 cc. was actually used. Since information about the snake indicated that it was not too dangerous, we thought it best not to use a second ampoule.

Within an hour after the bite the immediate area was black and the finger began to swell, though not excessively. The hand and lower arm swelled slightly. The patient was put to bed and fed normally with an excess of liquids. We had no strong pain-killers on hand; two calcium lactate tablets and four aspirin were given at 10:00 p.m. since by that time pain in the finger was severe. Dosage was repeated at 4:00 a.m. although these seemed to have no effect on the searing pain in the finger, too intense to allow sleep. By this time the swelling had receded to the finger and hand. Pain was gone from the upper arm, the only pain now being in the finger. The end of the finger was cold and bluish yellow. To increase circulation (we feared gangrene) it was wrapped in a hot poultice which caused more severe pain. The patient slept briefly before 6:00 a.m., then ate breakfast.

By morning a large blood blister had formed over the end of the finger around the site of the bite. This was drained and it continued to bleed all morning. Release of pressure eased the pain somewhat. Part of the nail and end of the finger were blackened. A slight rash developed over the knuckle. The patient slept two hours in the morning after which a terramycin+Vitamin B capsule was given. These were continued at six-hour intervals along with calcium lactate and Vitamin C tablets.

During the afternoon the patient's temperature rose to 102°F. A headache developed which continued throughout the day; it was likely due to the high fever. Moist hot packs were continued throughout the day at two-hour intervals. The pain continued. This plus the fever wore down the patient's energy and endurance so that weakness and depression followed. By night his temperature was 101°; the pain was reduced enough to allow fitful sleep.

The second morning a huge blister had formed on the back of the finger to the second joint although pain was reduced. The blister was drained but continued to fill. Fever had dropped to 99.8°, but it was obvious that the infection from the bite was spreading. The headache had gone by noon. In the afternoon the patient, whose spirits were now reviving, was carried to St. John's Hospital in Mzuzu, 50 miles away. Doctor Luke gave an intra-muscular injection of penicillin sufficient for absorption during an 8-day period. She removed the skin and some necrotic tissue from the blistered area on the tip, sides and back of the finger. The wound was dressed with penicillin ointment, a practice continued throughout.

By February 25 pain had gone from the finger and temperature was normal. All swelling had left the hand. Only the discomfort of the wound remained, but the finger was unable to bend. Terramycin and Vitamin C were continued. Liquids were given in excess and rest was considerable. There was a tendency to anuria during the first two days, but kidneys functioned normally soon after. By a week following the bite, the back of the finger was beginning to heal, but the end of the finger continued to be puffy, to drain, and showed no signs of healing. On March 4, the back of the finger was pink with new skin. The end of the finger continued to drain and the entire nail region was puffy. The patient's strength and color were nearly returned, although full strength was not regained for almost a month. After two weeks antibiotics were discontinued.

Since the wound was still draining and swollen, on March 13 the patient visited Dr. H. W. Bwanausi at the Government Hospital, Mzimba. He removed the nail and scraped the wound around the bite to induce better healing. Healing seemed to progress more rapidly after this treatment. By April 4, a pulling sensation in the finger had ceased, but the finger would still scarcely bend. The wound continued to drain around the scab until about April 15. The scab came off April 30, over two months after the bite. The finger was first used May 6, but it was still too stiff to bend more than half the normal amount after three months. It is reduced by a third its normal size due to tissue loss. The nail shows regrowth at the base. The skin is still very sensitive to touch. Obviously it will be a long time before use can be made of the finger, and it will surely never be the same again.

Although the serum injection halted generalized systemic effects from the venom, there was severe local tissue damage. This might have been lessened if part of the serum had been injected at the site of the bite and if penicillin had been given immediately to halt secondary infection. The hot packs likely speeded the spread of infection so should not have been used. Tourniquets, in this instance, may have been more damage than help as it would have been advantageous to reduce the concentration of damaged blood in a confined area. Major damage seemed to be from primary tissue destruction and from secondary infection. This resulted, no doubt, from bacterial infection from the snake's mouth plus inability of the necrotic tissue to cope with an infection; surely a major factor in snakebite.

Certainly the bite of a burrowing adder is not to be treated lightly. The same precautions should be taken with the patient as one would take with a larger viperine snake. Tissue damage can be severe around the site of the bite. Every effort should be made to reduce this damage which produces a very painful, slow-healing wound and may result in permanent scarring or lingering disability of the bitten element.

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SOME OF THE PROBLEMS INVOLVED IN THE STUDY OF THE FAMILY LEPTOTYPHLOPIDAE

By

D. T. CROW.

In October, 1963, while at the Umtali Museum, I asked Don. Broadley for the loan of the Study Collection of the family Leptotyphlopidae in order to do some revision of the Central African specimens. At the time, I was not fully aware of the difficulties to be encountered.

The size of these tiny snakes makes strong magnification necessary if detailed study is to be made. I first tried using a monocular microscope, but this proved ineffective due to the poor depth of field. A large magnifying glass was next tried, but difficulties were experienced with mounting the glass and in keeping the snake in focus while working on it. Eventually, after trying various combinations of lenses, I put my problem to Dr. Brain of the Queen Victoria Museum in Salisbury and he very kindly loaned me a binocular microscope of X10 power which proved more suitable. A variable X 15 to X 20 power microscope of this type should be ideal, giving ample magnification and a good depth of field. Unfortunately, as the magnifying ability of a microscope increases, more illumination of the object is needed. I partially solved this problem by focussing an old "hunting lamp" on the object. This was not entirely satisfactory as the snake was illuminated from the side and not from directly above.

Of the first five snakes which examined, two could not be placed as head shields did not agree with any of those in Dr. V. Fitz-Simons book "Snakes of Southern Africa", this being the only up-to-date and most comprehensive literature available to me at the moment; literature on this family being extremely thin.

All the specimens which I have examined have 14 scale rows which increases the difficulty of identification. Don suggested that separation of the species may be helped by using comparisons of the scale counts from chin to vent. This I have not yet attempted. However, I did check the subcaudal (pseudo sub-caudal?) count and the results are discouraging, though I have not checked all available material.

The remaining characteristics of the family which could be used for separation of the species are skeletal, and the difficulties involved in obtaining a skeleton are, for the amateur, enormous. Dr. Brain advises me that he obtained the skull used for illustrating Dr. FitzSimons' book by macerating the head in water for a week, then picking it clean under a dissect microscope using a needle. Obviously great care must be taken with such a fragile skeleton and it is not easy for the untrained student to handle the skeleton without causing damage which may be taken for genuine osteological characteristics.

I found it extremely difficult to distinguish the size and shape of the head shields in the light coloured specimens, as the sutures were hardly visible due to reflection of light. It was, therefore, necessary to stain the snake and I used a weak ink solution for the purpose, applying it with a brush, the surplus being washed off. One disadvantage of this being that the specimen is permanently marked and this may lead to some confusion when the snake is subsequently studied.

In conclusion I must stress that I do not consider that I have covered all the problems which confront the student of this family of snakes. However, I hope that the points brought out in this article will assist others in their studies.

Perhaps someone would like to tackle stomach contents?

CROCODILE NESTS AND THE KARIBA FLOODS.

By

B. MARSH.

Concern has been expressed by members of the Association about the safety of the crocodile nests below Kariba during the unseasonal and unnatural floods that occur when the spill gates are opened, as they were on the 16th October, 1963. The crocodiles nest in that area from the last week in September, with the eggs hatching around Christmas time and during this time the area was flooded to the capacity not usually experienced until February or March. Did this mean that most of the nests were destroyed?

A phone call to one of the departments concerned indicated that the problem had been considered officially. I was informed that the flooding may only be temporary, in which case the nests would then emerge from under water to continue their hatching normally. Unfortunately a crocodile egg "drowns" in under an hour. I then applied to the Ministry of Water Development for figures.

The gates were opened on the 16th October, 1963 discharging 27,000 cu.secs. increasing over three days to 162,000 cu. secs. where it was maintained except for short periods until the 9th March, 1964 when they were closed. Added to this figure was a further 20,000 cu. secs. from the turbines, making a total of 182,000 cu. secs. The flood season flow in February/March is plus or minus 200,000 cu. secs.

The average flow prior to Kariba in that area was - October, 12,000 cu. secs., November, 11.000 cu. secs., December, 11.000 rising to 32,000 cu. secs. with a maximum flow of as much as 140,000 cu. secs., which are flash floods off the Southern Rhodesian Catchment. These are not uncommon.

Peak floods in the wide areas of the river, which are the only areas we are interested in because they are the only places suitable for the survival of the newly hatched crocodiles, raise the level of the river from lowest level to highest level approximately 15 feet. There would only be a difference of a few feet between the natural flash floods of December and the unnatural floods created by the opening of the spill

gates in October, both during the nesting period. The conclusion we can come to is that the female crocodiles about to nest are aware that the river can rise 15 feet prior to hatching and that they make suitable provision for it in the placement of their nests.

SOME OBSERVATIONS ON CERTAIN REPTILES AND AMPHIBIANS IN CAPTIVITY.

By

A. J. IAMBIRIS.

A juvenile Boomslang (Disphlodis typus) has been seen to vibrate the posterior half of its tail when alarmed in a tree, on several occasions. The movement is reminiscent of that of the Rattlesnakes of America, but is not so rapid and rather irregular. I have never seen this in other Boomslangs, and have seen it in only one other Rhodesian snake - the Stripe-bellied Sand Snake (Psammophis s. subtaeniatus), which also waved the tipe of its tail in a similar manner when handled, for sometime after capture.

Puff-adders (Bitis a. arietans) and Mole Snakes (Pseudaspis cana) have learned to climb small branches that have been put into the cages and, although terrestrial, climb into the branches to sun themselves, especially in the colder weather.

A Spotted Bush-snake (Philothamnus semivariegatus)about one and a half feet long, which has been put into a cage with a young Bitis a. arietans, and a Vine Snake (Thelotornis kirtlandii capensis)about four feet long, fought with, and killed both snakes within fifteen days; although the cause of the deaths was not immediately apparent, post-mortems revealed numerous bites on both snakes, and the cause of death seems to have been shock rather than injury.

A large Platysaurus intermedius subniger caught near Lake MacIlwaine, which was heavily infested with mites, reacted vigorously against treatment until its belly had been gently stroked with Cotton wool. It then lay still, while the mites were "painted" with Olivine to kill them. Crocodiles (Crocodylus niloticus), especially the very young ones, also seem to like being tickled or gently scratched on the belly, and show every sign of enjoyment.

A Dispholidus t. typus which I caught near the Marimba River, Salisbury, was kept for a few days in a cage, and then I released it into an orange tree, to try to domesticate it. The experiment succeeded for two days but, when it found it could not find any chameleons (Chameleo d. dilepis), it left in search of a better place, and it was several days

before I recaptured it. It would appear that a good supply of a favourite food at close quarters is necessary if Boomslangs are to be persuaded to stay in one place.

Olive Marsh Snakes (Natriciteres o. olivacea)are feeding well on small frogs, which they readily take from hand, and are growing rapidly. When alert, they often raise their heads well off the ground and slowly wave their tongues about. I have noticed that they also do this when hungry and searching for frogs. When trying to avoid being picked up, especially for a few days after capture, they wriggle violently and also inflate the anterior part of the body slightly, but not the neck, as do the snakes of the genera Dispholidus, Thelotornis and Philothamnus.

A juvenile Ichnotropis squamulosa caught at Lake MacIlwaine settled down almost immediately after capture, and has become very tame and friendly. It is eating well, and appears to be fond of sugar, as are my other lizards.

Clawed toads (Xenopus L. laevis)feed well on raw meat, and I have seen several attack a dead dog that had been thrown into a river after being run over. They seem to have been attracted to the body by the freely flowing blood, and appeared to find the intestines a delicacy. I have noticed them take a mouthful of flesh and tear it off the main chunk by revolving in much the same way as a crocodile, at the same time pushing at the main piece of meat with their powerful back legs.

Other toads (Bufo and Pyxicephalus) make excellent pets, and feed well. They seem to be particularly fond of cutworms and ants, which they eat in large quantities. Frogs (Ptychadena sp., R. gravi, etc.), although really kept for food, are becoming very tame and will eat from the hand.

An Agama atricollis caught near Lake MacIlwaine, settled down surprisingly rapidly, and within a few hours ate some ants which had been offered to it with a pair of forceps. It has become very tame and is fond of lying under my reading lamp, where it "sun bathes" for hours.

A Wahlberg's Gecko (Homopholis wahlbergii) nearly a foot long refused to eat anything, and would spit out all food pushed into its mouth, but after a dose of Vitamin A aministered orally, it ate grasshoppers as soon as they were put into the cage. This treatment only lasted for a few weeks, however, and the Gecko was eventually released.

An adult Hylarana darlingi, which was caught at Bromley, was put into a cage with three juvenile Natriciteres o. olivacea as an experiment. Although the snakes eat small frogs, they do not trouble this one, and leave it well alone.

Snakes with canker respond well, as a rule, to Streptomycin, especially if injected subcutaneously, and if a suitable Penicillin

ointment or powder is applied to the infected areas to prevent the action of putrefactive bacteria, the mortality rate is reduced still further.

FURTHER OBSERVATIONS FROM UMTALI SNAKE PARK.

By

A. C. NEWMAN.

Olive Grass Snakes (Psammophis sibilans) are eating rodents, birds, lizards, chameleons and small snakes. One bird was taken by a leg and swallowed the hard way.

Cotton-mouths (Agkistrodon piscivorus)are eating raw meat, so is the Banded Cobra "Redmile" and two other Egyptian Cobras (Naja h. haje). I suspect Western Green Snakes (Philothamnus irregularis) eat raw meat, but as yet, haven't actually seen it.

Wahlberg's Geckos (Homopholis wahlbergii) which share a cage with Greater Plated Lizards (Gerrhosaurus major grandis)have been seen eating Mango and Banana when the fruit is over-ripe, they lap the juice, but when firm chew the fruit.

House Snakes are taking bats and frogs (Ptychadena sp.) as well as lizards and rodents, and Terrapins (Pelusios sinuatus) are eating chameleons and bats. A three foot Crocodile, caught on the 11th March, 1964 had a slight neck wound which the Terrapins were worrying. I had to take the Terrapins away until the wound had healed.

A six foot Egyptian Cobra disgorged five fowls' eggs after being caught. The eggs were not broken or marked in any way. The first egg disgorged was still hard-shelled and fresh-looking, the second and third looked normal, the fourth was very thin shelled and broke when taken out of the cage, the last egg had no shell at all, just a thin bag. This seems to indicate that digestion takes place mainly at the rear of the stomach. Numerous Mambas and Puff-adders have disgorged rodents in various stages of digestion, after being caught, and always the last part of the meal to be brought up has been dissolved.

On Saturday the 16th May last year, Don, Dave, Terry and I were watching a five and a half foot Egyptian Cobra, caught in Salisbury by Terry. This Cobra was floating on the water in the moat and reared up with a nice spread of hood. Terry advanced the theory that Cobras do this and use the hood as a sail. Don's reply cannot be printed, and Dave's remarks I cannot remember. Until proved otherwise, I like to think that Terry is right.

A four foot Leguaan, which we have had for three years, was bitten by Terry's Egyptian Cobra on the right back leg, at the knee, on the 13th May, 1964. The following day the limb was very swollen and stayed like this for over a month. The leg has now gone down to its normal size, but is stiff and the skin is pink. No other symptoms were visible. The reptile continued to eat and was active all the time. This same Leguaan takes a dozen eggs at a meal without breaking any - just swallows them whole. Occasionally she, or one of the others in the pit will break an egg, this is licked up. Their diet has consisted of meat, birds, chameleons, rats, snakes, young wild pigs, hares and Bull Frogs, all dead, and some very smelly. Snails are also eaten. Small ones are just swallowed. Big ones chewed to break the shell, and eaten with most of the shell.

Caught another two Mlanje Water-snakes (Lycodonomorphus mlanjensis) in the furrows at Old Umtali. The large female which we have had since January, 1962 is still eating well and measures 3 feet 3 inches.

Two Rock Leguaans (Varamus e. albigularis)are eating snails, millipedes, birds, rats, meat and lizards. Some of the lizards bury themselves under the sand and stone in the cage, but are dug out, chased and eaten alive. They also eat dead ones,

A four and a half foot Mole Snake (Pseudaspis cana), caught by R. Kroon at Inyanga, is a very nice plump specimen. It eats about six mice a week and seems to prefer white ones. A live mouse is caught anywhere on its body and in a flurry of movement is completely wrapped up in coils. Death is as quick as a Mamba or Puffadder bite.

Most of the Cobras in the Park eat while their eyes are opaque. One unusual marked Banded Cobra was actually swallowing a toad when the skin started to peel round the mouth. Within half an hour it had sloughed. This snake has a yellow band round the neck, two bands above the vent and one below the vent. It has been in captivity for three years, and is now four and a half feet long. "Redmile", the banded Cobra we have had nearly five years, is six feet long and in very good condition. The two Egyptian Cobras caught by Don in the Pipeline Trench in November, 1963, and the one caught by John Visser in Umtali at Christmas, 1963, are also doing well.

A seven and a half inch Cordylus giganteus sent to me by John on the 21st May, 1964 is doing very well. So is a Cordylus warreni regius given to me by Don. They share the same cage, eat well, and drink water by lapping like a dog. They are very tame and can be stroked on the back and under the chin. The C. w. regius shed in one piece like a snake, but the C. giganteus piecemeal, starting at the front of the back legs close to the body.

An eight foot Black Mamba (Dendroaspis p. polylepis) was given four mice one night at feeding time, all alive. I've never seen such greediness. The first mouse was still visible when it grabbed the next. The other two mice went the same way.

A Rufus Beaked Snake (Rhamphiophis o. rostratus) brought back by Don and Dave from their Mozambique trip, is doing well and takes about four live mice a week.

Western Green Snakes have been seen taking fledglings of Weaver Birds from the nest.

A two and a half foot juvenile Boomslang (Dispholidus t. typus) brought to me with a broken back last year in March, continues to make progress. The break was about four inches up from the vent, and has left a "step" in the snake's back. It eats chameleons, frogs and birds. After its last slough, the green colouration of the male is becoming visible.

Caught a large and well marked Egg-eater (Dayspeltis scabra). The scale rubbing and lunges were frightening to an audience of Africans. On being picked up she calmed down and took three birds eggs that night.

A baby Python about 30 inches long, which we have had for five months, is a good eater. The constriction is different from that of the Mole Snake and Mlanje Watersnake, Whereas the Python uses one or two coils, the other two snakes completely wrap up their prey and themselves into an oval ball.

The bronze Cape Cobra, the Puff-adder and two Ringhals given to me by John Visser nearly two years ago are doing well. The Cobra and smaller Ringhals come to the door of their cages at mealtimes always eager for another meal.

The big female Tiger Snake caught by Ronald Barton in Umtali last year, I regret to say had died about a month ago - egg bound. This snake was a record for the species, measuring 3feet 4 inches (865 + 150 mm.)

58.

O B I T U A R Y

WALTER ROSE. (1884-1964)

All herpetologists will regret the passing of Dr. Walter Rose, last year. Dr Rose spent most of his life practising as a dentist in Cape Town and, in fact, still had several regular patients until shortly before his death last year at the age of eighty.

His many interests included fishing, archery, animal welfare (which formed the subject of many of his numerous letters to the Press), and a lively interest in the local herpetofauna, for which latter interest he was best known.

Rose's work was done and his books written at a time when these were very necessary both to the advance of science and to the education and enlightenment of the public.

Dr. Rose was Hon. Curator of Herpetology at the South African Museum for a few years from 1958, during which time he made a start on the card-indexing of the collection. His book "The Reptiles and Amphibians of Southern Africa", which he fortunately revised two years before his death, is a record of the observations and photographs which he made during his lifetime. His work on the local frogs was particularly valuable and it is a tribute to his enthusiasm that three of these bear his name.

His book is the first to be acquired by one whose interest in the subject has just been aroused and furthers the interests and efforts of many a herpetologist.

C. E. Gow,
South African Museum,
CAPE TOWN.

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