

but no further. With the first rains they disappear to the south, and though a few may be found lingering well on into the summer in the low country east of Mongalla (lat. $4^{\circ} 30'$), I am of the opinion that the great majority migrate *very long distances towards the higher and drier country lying in the extreme S.E. of the Sudan near the East African border*, and that somewhere among these plateaux lie their summer quarters. Here they come not very far from the northern range of the true *thomsoni*, and are not separated from this animal by any natural boundary so formidable as that formed by the Sobat River and its swamps, which cut the species off from *G. rufifrons* in the north. Moreover, the Mongalla Gazelle never ranges within 100 miles of the Sobat River, the intermediate country being, in fact, unsuited to the habits of Gazelles to a considerable degree. Probably the form is almost exactly intermediate between *thomsoni* and *rufifrons*, with tendencies towards the former.

It is not found west of the Bahr-el-Gebel.

WHITE RHINOCEROS (*Rhinoceros simus*).

This animal exists all along the west bank of the Nile in the dry season, but is always very rare in the area under consideration. The natives say they drink at the river at night, and retire great distances into the forest during the day.

The above notes, which only deal with quite a small area of country (approximately 200 miles by 150) and have no pretensions to discuss the distribution of the animals mentioned outside thereof, tend to show how peculiarly patchy even within the same small area the distribution of any given species tends to be, and is an example on a small scale of what we often find and with as little apparent reason throughout the whole continent of Africa.

22. Descriptions of a new Snake from the Transvaal, together with a new Diagnosis and Key of the Genus *Xenocalamus*, and of some Batrachia from Madagascar. By The Hon. PAUL A. METHUEN, M.A., F.Z.S.

[Received October 9, 1919: Read November 4, 1919.]

(Text-figure 1.)

Genus XENOCALAMUS Gthr.

The discovery of a new form of *Xenocalamus*, described below, and the examination of the skull of *X. bicolor* Gthr. and of *X. transvaalensis*, sp. n., calls for a revision of the characters of this genus, for which I propose the following diagnosis:—

Maxillary short, with 4 or 5 solid teeth of moderate size gradually increasing in length posteriorly, followed, after a short interspace, by a pair of somewhat enlarged grooved fangs situated below the posterior half of the eye; palatines toothless or bearing a few small teeth; lower jaw with 7 to 9 rather small teeth on each side, those in the middle of the row the largest. Postfrontal bone fused with parietal. Quadrate showing tendency to enlargement and to having direct attachment to the skull, at the expense of the squamosal which may be very much reduced. Basisoccipitals reniform in profile. Posterior vertebrae without hæmal processes.

Head small and elongate, not distinct from neck; snout much depressed, very prominent; rostral large, with obtuse horizontal edge, flat or excavate below; eye minute, with round pupil; nostril between a large posterior and a small anterior scale, or in a single shield which may show incipient signs of similar division. A large præocular; no loreal; no præfrontals (fused with frontal); no anterior temporal.

Body cylindrical; tail short; scales smooth without pits, in 17 or 21 rows; ventrals rounded; subcaudals in 2 rows.

Tropical Africa, as far south as the Transvaal.

Synopsis of the Species of *Xenocalamus*.

- I. Palatine without teeth; rostral flat below.
- | | |
|---|--------------------------|
| A. Scales in 17 rows; nasal divided; 6 upper labials, third and fourth entering the eye. | |
| 1. A narrow supraocular; ventrals 218, subcaudals 24 to 36 | <i>X. bicolor</i> Gthr.* |
| 2. No supraocular; ventrals 229 to 239; subcaudals 31 to 36 | <i>X. mechoeii</i> Pet. |
| B. Scales in 21 rows; nasal entire; 5 upper labials, second and third entering the eye; ventrals 257, subcaudals 27 | <i>X. michelli</i> Müll. |

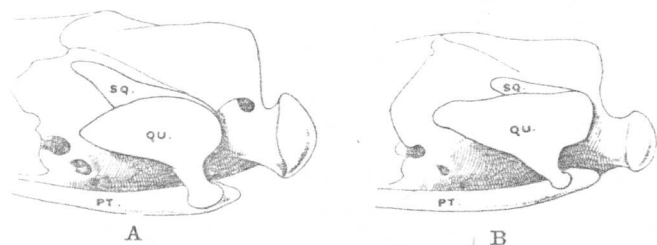
* The Transvaal Museum has an adult female specimen of *X. bicolor* (T. M. Cat. Rept., No. 1151), with exactly the same number of ventrals and subcaudals as the type; the specimen is, however, remarkable in that the third and fourth upper labials are fused into one large scale which alone enters the eye; in colour it is slate-blue above, head and neck lighter; from Reichtuit, Waterberg District, Transvaal.

- II. Palatine bearing 3 or 4 small teeth; rostral excavate below; nasal entire with incipient signs of division; 5 upper labials, second and third entering eye; scales in 17 rows; ventrals 195, subcaudals 31. *X. transvaalensis*, sp. n.

XENOCALAMUS TRANSVAALENSIS, sp. n.

Description.—Maxillary bone short, with 4 solid teeth of moderate size, the posterior ones the largest, and followed after a short interspace by a pair of enlarged grooved fangs situated below the posterior corner of the orbit. Palatine bearing 3 or 4 small teeth. Lower jaw with about 9 rather small teeth on each side, those in the middle of the row the largest. Quadrate large, attached directly to the skull in its anterior half; squamosal very much reduced, that part which is visible being only two-thirds the length of the quadrate (*vide* text-fig. 1).*

Text-figure 1.



Posterior part of skulls seen in profile: (A) *Xenocalamus bicolor*. (B) *X. transvaalensis*.

Head as broad as neck; snout depressed, prominent but not as much so as in *X. bicolor*; rostral large, rather acutely rounded, with rounded horizontal edge, excavate below, in contact with the nasal. Nostril pierced in a single scute which abuts on the rostral (the division of the rostral shield into a very small and a large scale as in *X. bicolor* is suggested by incipient sutures; in *X. bicolor* the sutures are distinct). Internasals large, forming a median suture, separated from the first upper labial by the rostral. The large præocular forms a suture with the rostral and the internasal in front. Supraocular and postocular scales minute. Frontal very large, rounded in front, more or less heart-shaped, a little more than half as long as the distance from the tip of the rostral to the posterior limit of the frontal (actual measurements being 5.2 mm. : 9.4 mm.). Parietals elongate, forming a long suture, not quite so long as the frontal. Five upper labials; the first and fifth very small, the fourth enormous, the second and third entering the eye; the third forms a short suture with the postocular. Six lower labials, third very large, first and

* In *X. bicolor* the quadrate differs somewhat in shape and is not as large as in *X. transvaalensis*: further, the visible part of the squamosal is seen as a curved horn-shaped process extending a considerable distance across the supratemporal region (*vide* text-fig. 1).

second very small; the first pair of lower labials forms a median suture. A single pair of rather small chin-shields, which form sutures with the first, second, and third lower labials.

Ventral scales 195, rounded; anal divided; 31 pairs of subcaudals.

Body cylindrical, slightly depressed.

Blue-black above, below white with dark brown transverse markings on the ventral scales; throat, lower jaw, and upper lip nearly entirely white.

Total length 414 mm., of which the tail measures 44 mm.

A burrowing snake found in sandy soil, north of the Zoutpansbergen, Northern Transvaal, near the Ingelel River, within 25 miles of the Limpopo: collected by Messrs. Noomé and Roberts, in September, 1913: it was observed to be sluggish in its movements.

Type in the Transvaal Museum, Cat. Rept. No. 1689.

BATRACHIA.

In 1913 Mr. Hewitt and I published an account of a collection of Batrachia made in Madagascar (2): I have since been able to compare many of the specimens referred to in this paper with material in European Museums, and especially with that in the British Museum. I have also been able to profit by the criticisms of Mr. G. A. Boulenger on several specimens I submitted to him. I gladly avail myself of this opportunity for thanking him for his advice on many occasions, and among other things for suggesting the names of the two new genera described below, and for pointing out their affinities to the genus *Mantidactylus*.

GEPHYROMANTIS, gen. nov.

Vomerine teeth present; digits with supernumerary phalanx; terminal phalanges dilated at end, the dilatation with shallow notch distally, reniform; lower surface of digits with ring-shaped groove; outer metatarsals united; style of sternum and omosternum long, slender, and bony; pupil horizontal; tongue well developed, bifid behind.

GEPHYROMANTIS BOULENGERI, sp. n.

Description.—Head longer than broad; snout subacuminate; nostril a little nearer tip of nostril than eye; loreal region deeply concave; canthus rostralis curved; diameter of eye very nearly equals the distance from eye to tip of snout. Interorbital space equals breadth of upper eyelid. Tympanum distinct, $\frac{1}{2}$ the diameter of eye. Fold over tympanum swollen anteriorly and posteriorly. Vomerine teeth as in *Mantidactylus granulatus*. Fingers moderate, first a little shorter than second, considerably shorter than fourth, their tips expanded into discs which are large on the third and fourth fingers, being about double the breadth of the penultimate joint; subarticular tubercles of digits and metacarpus prominent. Toes moderate, $\frac{1}{4}$ webbed, their tips

expanded into discs of moderate size, not quite as large as those on third and fourth fingers; a sliced pear-shaped inner metatarsal tubercle, barely $\frac{1}{2}$ length of first toe; a small outer metatarsal tubercle.

The tibio-tarsal joint of the adpressed leg reaches a point between the eye and the nostril. Heels strongly overlapping. Length of tibia $\frac{1}{2}$ the distance from snout to vent, about $3\frac{1}{2}$ times as long as broad.

Upper surfaces of head, body, and limbs very granular with numerous warts and elongated tubercles, which on the head and back form an irregular pattern. Belly, sides, and inner parts of thighs granular.

Habit like the *M. granulatus* section of the genus *Mantidactylus* (1).

Colour: Above dark bluish-brown with irregular lighter markings more in evidence on the head than elsewhere; upper lip, loreal region, throat, and chest mottled with dirty white and dark brown; an irregular median dirty white line on throat and chest. Upper surfaces of limbs same colour as back, the lighter brown colour of the inner parts being carried across the upper surfaces as thin irregular transverse bars.

Length from snout to vent 27.50 mm.; length of outstretched hind limb from vent to tip of fourth toe 44 mm.

Size of eggs in oviduct 2.75 mm. in diameter.

Type a female, T. M. Cat. Rept. No. 1013, and cotype No. 1012, in the Trausvaal Museum; origin, Fohohy, East Madagascar, 1911.

In 1913 Mr. John Hewitt and I placed these two specimens—for lack of comparative material—*pro tem.* in the genus *Mantidactylus*, the genus to which this new form is most nearly related (2).

TRACHYMANTIS, gen. nov.

Hemimantis: *H. horrida* Bttgr. Zool. Anz. 1880, p. 282; Abhand. d. Senck. Gesell., B. xii. p. 492, Taf. iii. fig. 14, 1881.

Arthroleptis: *A. horridus* Bouleng. Cat. Bat. p. 118.

Microphryne Methn. & Hwtt. (2) p. 55, preoccupied.

The only character I have to add to our original diagnosis concerns the discs of the digits, as in *Mantidactylus* and *Gephyromantis* the lower surface of the digits has the characteristic ring-shaped groove. This character in *Mantidactylus* was pointed out by Mr. Boulenger (1) when he made the genus *Aglyptodactylus* for *Mantidactylus madagascariensis*. I must also correct what was our impression at the time, that *Trachymantis* was related to *Rhacophorus*; *Gephyromantis*, which is very closely related to *Mantidactylus* and may even be a comparatively recent offshoot from a *M. granulatus*-like form, leads naturally to *Trachymantis*; the relationship can be shown thus:—

Mantidactylus: vomerine teeth; outer metatarsals separated.

Gephyromantis: vomerine teeth; outer metatarsals united.

Trachymantis: no vomerine teeth; outer metatarsals united.

In 1913 (2) we pointed out that we strongly suspected *Rana labrosa* to be the only truly endemic Ranid in Madagascar which was not supplied with the supernumerary phalanx to the digits; and that Böttger's "*Arthroleptis (Hemimantis) horridus*" belonged to the same genus as our "*Trachymantis (Microphryne) malagasia*." In 1914 I had an opportunity of examining Böttger's type at Frankfort with Dr. Sternfeld: we were both of opinion that *Arthroleptis horridus* should be referred to our genus, and that the two species *horrida* and *malagasia* were very closely allied. This fully confirmed our presumption as to Madagascar Ranids*.

Besides the differences cited in the two original descriptions, the following distinctions were noticed: in *T. malagasia* the snout is slightly longer as compared with the diameter of the eye and more pointed than in *T. horrida*; in the latter species the discs of the digits are larger than in *T. malagasia*. The tympanum in *T. horrida* is more visible and a shade larger than in the other species. The femurs in *T. horrida* are glandular, but lack the huge glands of *T. malagasia* which we suggested might be an abnormal development. In Böttger's species the granules on the ventral surface end in a sharp point; they might almost be described as small pointed tubercles; in our species they are replaced by swollen granules of larger size.

MANTIDACTYLUS ARGENTEUS, sp. n.

This species falls into the group with large discs to the fingers, and with granular belly (1): nearest ally seems to be *M. granulatus*: the upper surfaces have however no asperities.

Description.—Head flat and depressed, longer than broad; snout subacuminate, practically pointed, strongly projecting beyond the mouth; nostril considerably nearer tip of snout than eye; distance from eye to nostril $\frac{1}{2}$ diameter of eye. Tympanum distinct, $\frac{1}{2}$ diameter of eye. Interorbital space a fraction greater than breadth of upper eyelid, equal to diameter of tympanum. Loreal region concave; canthus rostralis lightly curved; fold over tympanum feebly developed. Exposed part of vomers bearing the teeth not so prominent as in *M. granulatus*, with large median space between them. Fingers well developed, their tips expanded into discs about, or a fraction more than, double the breadth of the penultimate joint; on the first finger, which is much shorter than the second, the disc is smaller than this. Toes moderate, their tips expanded into discs which are much smaller than those of the hand, being barely $\frac{1}{2}$ their diameter. Toes $\frac{2}{3}$ webbed. Inner metatarsal tubercle rather small, not prominent.

Tibio-tarsal joint of adpressed leg reaches the nostril or just short of it. Heels strongly overlapping. Distance from snout to vent $1\frac{3}{4}$ times as long as tibia, which is 5 times as long as broad.

* Vide also (3).

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Dorsal surfaces without asperities, but with very fine reticulations: some glandular granulations in coccygeal region. Belly, sides, inside of thighs, and round vent, granular.

Colour: Above brownish-purple or vinous flecked with dirty white; limbs same colour with light narrow transverse bars. Sides marbled with brown and silver; tympanum dirty white flecked with silver; lower half of eye, loreal region, snout and lips, dirty white; throat and chest silver white, yellower on chest, becoming dirty white on belly and thighs.

Length from snout to vent 32 mm.; length of leg from vent to tip of fourth toe 52 mm.

Size of egg in oviduct 2.5 mm. in diameter.

Type a female, T. M. Cat. Rept. No. 1009; cotype a juvenile specimen, toes $\frac{2}{3}$ webbed, tympanum $\frac{2}{3}$ diameter of eye, tibio-tarsal joint of adpressed leg reaching tip of snout, No. T035; both in the Transvaal Museum: origin, Fohohy, East Madagascar, 1911.

PLETHODONTOHYLA TUBERIFERA, sp. n.

P. notosticta Gthr., Mthn. & Hwt. (2) p. 60.

Under the name *P. notosticta*, Mr. Hewitt and I provisionally identified seven examples of this genus, indicating at the same time that our specimens were by no means typical (*l. c.*). I have since compared ours with the examples of this genus in the British Museum and find that our specimens represent a new form. Its distinguishing characters are as follows:—Head flat and depressed; loreal region very oblique; no canthus rostralis; a rounded or more or less pointed snout projecting only slightly beyond the mouth; discs of digits larger than in any other known species of the genus; on each side in the sacral region a small prominent tubercle. In the natural arrangement of the genus, *P. inguinalis* appears to be intermediate between the new species and *P. notosticta*.

Description.—Head $\frac{3}{4}$ as long as broad, flat and depressed; snout rounded or more or less pointed, extending only slightly beyond the mouth; loreal region very oblique; no canthus rostralis; interorbital region twice the breadth of the upper eyelid; tympanum distinct, $\frac{1}{2}$ or nearly equal to the diameter of eye. Tongue typical for the genus. Vomero-palatine teeth in a long chevron-shaped transverse series, interrupted in the middle, and extending just beyond the choanae. Fingers moderate, dilated into large triangular discs, that on the third finger being $\frac{2}{3}$ the diameter of the eye; first finger considerably shorter than second, with only slightly expanded disc; hand with flat inner and outer metacarpal tubercles coalescing medianly. Toes rather short, expanded into triangular discs, that on the fourth toe being about $\frac{1}{2}$ the diameter of the eye, that on the fifth toe small. Toes free*. A flat elongated inner metatarsal tubercle, rather poorly developed.

* In 1913 (*l. c.*) we stated that the toes had trace of webbing at the base. We wrongly interpreted the integument which is usually present in a more or less developed form at the base of webless toes in many frogs as a rudimentary webbing.

Tibio-tarsal joint of adpressed leg reaches as far as the eye.

Upper parts smooth with a prominent little tubercle on each side overlying the expanded ends of the diapophyses of the sacral vertebrae. Posterior parts of belly, sides, and of thighs near the vent, granulate.

Colour: Ground-colour dirty white; dorsal surface blotched or spotted with dull magenta, darkest on head and snout; the tubercle on sacral region surrounded by dark horseshoe-shaped blotch; a dark line from eye, through tympanum, along side nearly to a point reached by tibio-femoral joint of adpressed leg.

Length from vent to snout 30 mm.

Types in the Transvaal Museum, Cat. Rept. Nos. 1265 to 1271; No. 1269 presented to the British Museum. Origin, Ambato-haranana, forest of Central East Madagascar, 1911.

The terminal phalanx is Y-shaped; in *P. notosticta* it is broadly Y-shaped; and in *P. inguinalis* it is also Y-shaped. So I think, in the diagnosis of the genus, this bone should be described as Y-shaped or broadly Y-shaped, rather than as T-shaped as in the Brit. Mus. Cat. The internal structure of this species was examined: it is typical for the genus.

Bibliography.

- (1) "On the Madagascar Frogs of the genus *Mantidactylus*." By G. A. Boulenger, F.R.S. P. Z. S. 1918, pp. 257-261.
- (2) "On a Collection of Batrachia from Madagascar, made during the year 1911." By Paul A. Methuen & John Hewitt, B.A. Ann. Transvaal Mus., No. 2, vol. iv, 1913, pp. 49-64.
- (3) "A comparative review of the Amphibian Faunas of South Africa and Madagascar, with some suggestions regarding their former lines of dispersal." By John Hewitt, B.A. Ann. Transvaal Mus., April 1911, pp. 1-11.