

On the dorsal surface of the auricles there is a pit about 0·03 millim. deep, and 0·025 millim. in length and breadth, diminishing downwards, which is cut off from its surroundings by a sharp and fine contour. At the bottom of the pit numerous nervous fibres enter from the subcutaneous nervous plexus, and these run to a reniform body which occupies the middle third of the depression. This body is of fibrous structure, and the fibres composing it are apparently confusedly intermixed. With picocarmine it stains yellowish red, and much more intensely than the dotted substance which otherwise resembles it in appearance. From the free surface of this body arise a number of setæ, about 0·025 millim. in length and 0·002 millim. in thickness, which project beyond the cilia of the surrounding epithelial cells. At their free extremities these filaments are furnished with small knobs. The inferior third of the pit is only partially filled by the entering nerve-fibres; the rest is occupied by a large cell about 0·008 millim. in diameter, possessing a distinct nucleus which only stains faintly. As to the function pertaining to this organ I am quite in the dark; it is perhaps a tactile organ.

Hitherto I have been unable to find any other terminal apparatus of the nerves either in *Triclades* or in *Rhabdocœla*, with the exception of the tactile apparatus at the anterior extremity of the body in *Graffilla muricicola*, already described by me in detail; nevertheless I have often been able to trace the nerves as far as the epithelium. The only other things that I might mention are the small pale pencils which I have found among the epithelial cells of the auricular processes in *Planaria gonocephala*, and which are perhaps connected with nerve-fibres.

XLI.—*Notes on Batrachians from Perak.*

By Dr. A. GÜNTHER, F.R.S.

[Plate XVI.]

MR. L. WRAY, JUN., of the Perak Museum has again forwarded to the British Museum a small collection of Batrachians which supplies some additional information for our knowledge of the Reptilian fauna of the interior of the Malayan Peninsula. I beg to offer the following notes on some of the species sent.

Rana macrodon, Kuhl.

Mr. Wray found this species on the hills of Larut, between 3000 and 4000 feet. In the adult female specimen which he sent the tarsal fold of the skin, which is generally found in this species, is wanting. Its occasional absence may also be observed, though rarely, in *Rana tigrina*.

Phrynella pulchra, Blgr.
(Pl. XVI. fig. B.)

This toad was described and figured in this journal (1887, vol. xix. p. 346, pl. x. fig. 2) from two specimens obtained in the district of the town of Malacca. Mr. Wray has now sent a third specimen from an altitude of about 3000 feet on the hills of Perak which differs so much in coloration and general appearance from the types that I had some difficulty in recognizing it. But on perusing the notes sent by Mr. Wray with the specimen I have come to the conclusion that it must be referred to the same species.

The specimen is a male; its colour is now almost uniform purplish black above and below, only more or less indistinct traces of the ornamental markings being visible; thus especially the whitish and subtriangular mark above the vent and a spot of similar colour on the heel. Of the lower parts the throat is the darkest, the remainder being finely marbled with brown and grey.

The extremity of the snout is more pointed and less square than in the figure quoted, the nostrils being closer together.

The limbs, especially the toes, are shorter, and the disks of the fingers and also the toes broader.

Very singular is the development of the subarticular tubercles of the fingers (see fig. B). The proximal portion of the fingers is stout and the tubercles are dilated into large, soft, transverse pads, two on each of the outer fingers and a single one on each of the two inner ones. On the outer fingers the pads of each pair are close together, the anterior fitting into a hollow of the posterior.

The tongue is not entire as stated in the original generic diagnosis, but heart-shaped, being distinctly notched behind. I should describe the diapophyses of the sacral vertebra as much dilated.

Mr. Wray writes about this specimen as follows:—

“Above dark olive-brown; from the eye an oblique yellow line to angle of mouth; a pale olive-yellow mark across forehead, through the eyes, and down the sides of the body to the

thighs. This band is minutely spotted with dark brown principally along the centre. There is also a triangular dark-centred mark of the same colour on the anal region, extending to the top back surface of the thighs. The legs and arms banded in the same way.

"Beneath, throat dark brown, passing into yellowish on breast; abdomen hair-brown, minutely spotted with whitish brown. Legs and arms, palms of hands and feet the same. Irides red-brown, diamond-shaped, horizontal. The colour and form of markings are subject to considerable variation, and the intensity of colour is in a great measure subject apparently to the will of the animal. It may range from dark to pale brown. I have not been able to find out why they change colour; they do not seem to change when frightened, nor does the colour of the surface on which they rest have any effect on them, but when in the dark they are usually light-coloured, and when in the light dark-coloured.

"They inhabit the hills of Perak from 3000 feet upwards, and live in holes in trees which are so situated as to contain more or less rain-water. They have a loud, flute-like, musical note, which they utter at irregular intervals, principally during the night. The form and size of the hole in which they are seems to have a great deal to do with the loudness of the note, as specimens when extracted from their holes have far more feeble vocal powers than they had when in them. The pitch of the note is also much altered by the resonant properties of the cavity. These frogs blow themselves out with air, and look more like bladders than anything else. When inflated they float on the surface of the water, and will remain motionless for a long time with legs and arms stretched out."

Bufo quadriporcatus, Blgr.
(Pl. XVI. fig. C.)

This species was described and figured from a single and not very well-preserved specimen, apparently a male, in this journal, vol. xix. p. 347, pl. x. fig. 4 (1887). Mr. Wray has sent a female specimen in a better state of preservation. The whole of the surface is densely covered with larger and smaller conical or semiglobular tubercles, the larger tubercles being placed in a series continuous with the parotoid, and in an irregular row along each side of the vertebral line, also the eyelids and the head between the eyes are covered with small tubercles. Two metatarsal tubercles of moderate size. There is no tarsal fold of the skin, but its place is occupied by a row of four horny conical tubercles, each with an acute black

point. Upper parts brownish, marbled with olive, some of the large tubercles surrounded by a black ring; parotoids and the tubercles of the series behind it whitish, more or less distinctly edged with black; limbs irregularly barred, lower parts white, marbled with brown, especially across the stomach.

Mr. Wray says that this species is rare, he having obtained two specimens only, and that it inhabits the hills of Perak from 800 feet downwards.

Polypedates leprosus, sp. n. (?).

(Pl. XVI. figs. A, a, a'.)

Habit hyliform, with very large and broad head. Vomerine teeth rudimentary, on a short linear ridge, the ridge on each side being close to the choana. No conical papilla on the middle of the tongue. Snout very broad, with the canthus rostralis angular, and the loreal region sloping; nostril lateral, but close to the tip of the snout. Interorbital space wider than the upper eyelid. Tympanum distinct, not quite as wide as the eye. Fingers quite free; toes broadly webbed; disks of fingers and toes large, the largest being at least half the size of the tympanum; subarticular tubercles well developed, inner metatarsal tubercle ovoid. The tibio-tarsal articulation reaches the extremity of the snout, when the hind limb is drawn forward along the side of the body. All the upper and lateral parts are covered with rough tubercles, between which numerous very large ones like glands are scattered over the back, the upperside of the head, and the upper parts of the limbs; also a part of the tympanum shows some minute granules. The whole frog is bluish black in spirit; but some of the large tubercles are of a lighter colour, either entirely, or only the roughnesses with which they are covered are whitish; lower parts coarsely granular, with vermiculated whitish lines.

Distance between snout and vent 30 lines; distance between the angles of the mouth 11 lines; distance between the vent and extremity of fourth toe 49 lines.

Mr. Wray gives the following notes:—"Above rich warm chocolate-brown. The tops of the warts paler, some of those on the back yellow. Beneath—body, legs, and arms jet-black, irregularly marked with pale bluish grey. Under surface of fingers and toes bright rose-red. Web to feet and top surface of all the disks same colour. Irides pale warm brown, pencilled radially with black, a fine yellowish-orange line forming inner edge to irides.

"Pupil diamond-shaped, horizontal.

"The colour and rugose character of the skin of this frog is evidently a means of protecting it from birds and other enemies, the whole upper surface being such a close copy of the bark of a tree that it is very hard to detect one when resting upon it.

"This species also lives in holes in trees, and the note produced by it is not so loud as that of *Phrynella*, and has a more metallic ring in it.

"My specimens were obtained at an elevation of 4000 ft. on the hills of Larut, Perak."

Mr. Boulenger has directed my attention to the fact that this species resembles closely a frog from Padang, shortly noticed and rudely figured under the name of *Hyla leprosa* by Schlegel, in a popular work, 'Handb. der Dierk.' ii. p. 55, pl. iv. fig. 68. Tschudi considered it the type of a distinct genus, *Theloderma* (Class. Batr. 1839, pp. 32, 73); and more recently it was more fully described by Horst (Notes Leid. Mus. v. p. 237). The two latter authors agree in ascribing to the frog a tongue cordate behind, but terminating in a single appendage. If this form of tongue is really characteristic of the Padang frog, the latter would have to be referred to a genus distinct from *Polypedates*; but if it be merely caused by some accident, our specimen may prove to be identical with that in the Leyden Museum. In either case the creation of a synonym will be avoided by adopting here the same specific name.

Megalophrys longipes, Blgr.

Megalophrys longipes, Blgr. Proc. Zool. Soc. 1885, p. 850, pl. lv.

This species is rare and local, Mr. Wray having succeeded in obtaining three specimens only, of which one was captured at an elevation of 4400 feet.

MISCELLANEOUS.

Observation on Multiplication in Amœbæ. By LILLIE E. HOLMAN.

ON the 4th of July, 1886, I was examining the forms of life contained in a Holman life-slide which had been filled for several hours. It contained different Infusoria, and, among other animals, specimens of *Æolosoma*. But it seemed for some time as if there were no *Amœbæ* in the slide, until I discovered a small one near the channel. In shape it seemed like an elongated triangle, and was rather torpid, or, at least, moved but little. While I was examining it, it moved up closer to the line of the channel, and another *Amœba*, about twice the size of the first one, came gliding on the scene. It moved up very close to the other, and in a few



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