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6. „ “On the Crustacean Fauna of Central
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7. „ “On the Crustacean Fauna of Central
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REPORT ON THE FISH COLLECTED IN TIBET
BY CAPT. F. H. STEWART, I.M.S.

By R. E. LLOYD, M.B., D.Sc., Capt., I.M.S.

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This collection includes eight species, all of which were taken from the Nyang Chu, a stream of some magnitude, which flows by Gyantse and Shigatse to meet the Tsang-po. Of these species three are new to science. During the expedition of 1904 Captain H. J. Walton collected seven species of fish, of which no less than six were found by Mr. Tate Regan to be new species. As only two species, *Nemachilus stoliczkae* and *Schizothorax macropogon*, are present in both collections, we may conclude that the waters of Tibet contain a considerable variety of fish.

Nemachilus stoliczkae, Day.

Numerous specimens.

Ptychobarbus conirostris, Steindachner.

One specimen 175 mm. in length.

Schizothorax macropogon, Regan. (Pl. xxv, fig. 4.)

Three specimens measuring 26, 29 and 37 cms. They differ slightly from the described type of the species, which was from Lhasa.

The length of the head is only $\frac{1}{3}$ of the total length, and the barbels are as long as the head excluding the snout.

Schizopygopsis stoliczkæ, Steindachner.

A very common fish in these waters (identified by Captain Stewart).

Schizopygopsis stoliczkæ (colour variety). Specimens were taken in which the pigment of the back was concentrated in stellate spots: this peculiarity had no dependence on illumination, age, or sex.

Parexostoma stoliczkæ (Day).

Two specimens, measuring 250 and 190 mm. respectively, have been referred to this species. They agree very closely in their proportions with certain of Day's specimens from Leh in Western Tibet. They differ, however, somewhat in that their heads are relatively larger and flatter. In colour they are olivaceous above, the pigment being arranged in a speckled manner on a yellow ground; below they are dull yellow.

P. maculatum, Regan, from Lhasa seems to resemble *P. stoliczkæ* very closely, except in colour. In this respect, however, our specimens from Gyantse appear to agree, judging from the descriptions, with the specimens from Leh more closely than with those from Lhasa.

In the specimens from Gyantse, the head length is more than $\frac{1}{2}$ of the total length, the length of the snout is $1\frac{1}{2}$ times the interocular distance as in *P. maculatum* and as in many of Day's type specimens (of *P. stoliczkæ*) from Leh.

In Day's description of this latter species, however, the length of the snout is said to be twice the distance between the eyes.

Schizopygopsis stewartii, n. sp. (Pl. xxv, fig. 1.)

The length of the head bears to the length of the body (without the caudal) the proportion of 1:4. The head is flattened above, the snout being conical and pointed, the point of the lower jaw and the snout reach to the same level. The diameter of the eye is to the length of the head as 1:7; to the length of the snout as 1:2. The length of the snout is slightly greater than the interocular distance.

The dorsal fin contains three spines and seven rays, the third ray is deeply serrated and is about as long as the postocular part of the head. The first spine is situated nearer to the root of the tail than to the end of the snout, the distances which separate these

points being in the proportion of 5: 6. By "root of the tail" is meant the point where the lateral line ends against the caudal fin.

The anal fin contains three spines and six rays, and nearly touches the caudal when laid flat.

The pectoral, pelvic, and anal fins very nearly of the same length, which is slightly less than the postocular part of the head.

There are 110—120 scales in the lateral line. Behind the operculum the scales are arranged in eight to ten rows, placed one above the other; in each row there are two to four scales, they are irregularly imbricated. The "tiled" row contains thirty to thirty-five scales, on either side of the vent the diameter of these scales is $\frac{2}{3}$ that of the eye in front, and behind the vent their diameter becomes considerably less.

There are no barbels.

Pharyngeal teeth 4.3 | 3.4; the teeth of the outer row are longer than those of the inner and are curved.

Colour.—Silvery with dark uniformly distributed small blotches apparently under light control. Top of head dirty olive extending on to the cheek, dorsal and caudal fins dirty olive. Pelvic, ventral and anal fins orange-red near the free margin.

An active predatory fish; a small fish of another species was taken from the stomach of one of the specimens.

Schizothorax o'connori, n. sp. (Pl. xxv, fig. 3.)

Length of the head to the length of the body (without caudal) bears the proportion 1: 5.

The greatest depth of the body is a little more than the length of the head. The diameter of the eye is $\frac{1}{8}$ of the length of the head. The eye is nearer to the snout than to the posterior border of the operculum, being separated by two diameters from the former and three diameters from the latter.

The diameter of the eye is to the length of the interocular distance as 2: 5.

The shape of the head is that of a bluntly pointed cone; between the eyes the head is nearly flat, but in the middle line a raised crest of the frontal bone projects slightly. (This may only be visible in the spirit specimen.)

The mouth is transverse and is only slightly curved. The snout projects well beyond the level of the lower jaw. The posterior barbel is in length about $\frac{2}{3}$ of the diameter of the eye, the anterior barbel being somewhat less than this.

The dorsal fin is situated behind the level of the ventrals, its first spine is somewhat nearer to the root of the tail than to the snout, the proportion of the distances which separate these points being as 6: 7.

There are three spines and eight soft rays in the dorsal fin, the third spine being equal to the length of the head without the snout. In the character of this spine the two specimens differ considerably; in the larger specimen the serrations are distinct but small, and the

distal half of the spine is flexible, in the other the spine is much stouter, the serrations are longer and only the distal third is flexible.

The anal fin contains three feeble spines and seven soft rays; when laid flat it does not quite reach to the caudal.

L.L. 105—110,—L.tr. 25—1—25. The "tiled row" contains fifteen scales, each about $\frac{3}{4}$ of the diameter of the eye. Pharyngeal teeth ten on either side, rows not regularly arranged.

Colour.—"Bluish above with steel-blue scales; sides yellow orange; belly white; upper surface of head dirty olive; cheeks golden."

Oreinus baileyi, n. sp. (Pl. xxv, figs. 2, 2a.)

Length of head is to the length of the body (without caudal) as 1: 4. The head is scaleless, and conical in shape, the upper profile slopes downwards, but the lower profile is almost in a line with the ventral surface of the body. The diameter of the eye is to the length of the head as 1: 7.

The eye is to the snout in length as 2: 5.

The dorsal fin contains three spines and seven rays; the third spine is stout and deeply serrated posteriorly; it is jointed and flexible near the tip, and is as long as the postocular part of the head. The first dorsal spine is much nearer the root of the tail than to the snout. The distances which separate these points being in the proportion of 3: 4. The anal fin contains three feeble spines and six rays; when laid flat it does not quite touch the caudal.

The pectoral, pelvic, and anal fins are all very nearly of the same length and are equal to the length of the head excluding the snout.

The length of the caudal fin is equal to the greatest depth of the body.

Both upper and lower lips are very thick and fleshy, so that they appear as though covered by a mask.

The lower lip has a deep median notch which converts it into a horse-shoe-shaped sucker.

The maxillary barbel is as long as the lower lip, the rostral barbel is somewhat shorter.

Pharyngeal teeth 5.3.2 | 5.3.2.

Lateral line contains about 100 scales. The "tiled" row of scales contains about 23. The diameter of the largest of them is about $\frac{3}{4}$ of the diameter of the eye.

Colour.—"Steel-blue, silvery, with a tinge of gold on the sides; back of the head is dirty olive, a tinge of gold on operculum; dorsal and caudal fin spotted with black; also irregular black spots over the body."

DESCRIPTION OF THE TADPOLE OF *RANA*
PLESKII, WITH NOTES ON ALLIED
FORMS.

By N. ANNANDALE, D.Sc., Superintendent, Indian Museum.

The only species of Batrachian represented in Captain Stewart's collection is *Rana pleskii*, Günther, which has already been recorded from the neighbourhood of Gyantse by Boulenger (*Ann. Mag. Nat. Hist.* (7), xv, p. 378, 1905).

Rana pleskii, Günther.

R. Pleskii, Günther, *Ann. Mus. St. Petersb.*, 1896, p. 199.

Several adult specimens of various sizes, and tadpoles in various stages from the neighbourhood of Gyantse.

Boulenger (*op. cit.*) records this species from an altitude of 15,000 feet, and Captain Stewart tells me that it is abundant all about Gyantse, occurring even in small puddles of water and in mountain streams. Like its allies *R. vicina* and *R. liebigii* it appears to be mainly aquatic in its habits.

The fact that *R. pleskii* breeds at an altitude of 13,000 feet or over is interesting. There is a full-grown tadpole in Captain Stewart's collection which was taken in April at the height mentioned, and a very small frog taken in November at the same height. There are also several smaller tadpoles, all of which are unusually well preserved. The following description is drawn up from the largest tadpole, which has the hind legs about 10 mm. long but no signs of the fore limbs:—

Tadpole of *R. pleskii*, Günther—

Total length 72 mm.; length of tail 45 mm.; greatest breadth of body 13 mm.; depth of body 9 mm.; greatest depth of tail 12 mm.; of caudal muscles 8 mm. Head and body flat; eyes far apart, dorsal; nostril dorsal, a little nearer the tip of the snout than the eye; spiracle sinistral, pointing backwards and upwards; anus opening on the right side; caudal fin commencing well behind the level of the base of the hind limbs, continued round the tail to the anus, bluntly pointed at the tip. Lips moderately well developed, both with a fringe, which is only interrupted for a short distance in the middle of the upper lip; both jaws serrated at the edge and roughened on the external surface; the upper jaw bearing a couple of long, narrow teeth at either end; lower jaw crescentic,

undivided; dental formula $\frac{1}{3+8}$. Colour slate-grey, indistinctly marbled on the tail and fading to white on the belly.

For the sake of comparison I give a description of a somewhat similar tadpole which appears to be that of *R. vicina*, a frog found

above 6,000 feet in the Himalayas and common in the Simla district and in Kumaon. I have found this tadpole with the adult of the species to which I assign it both in Kumaon and in the Simla hills:—

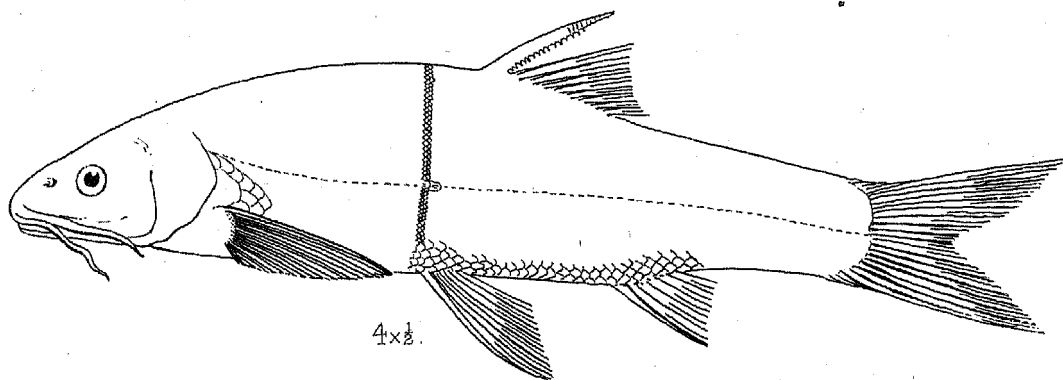
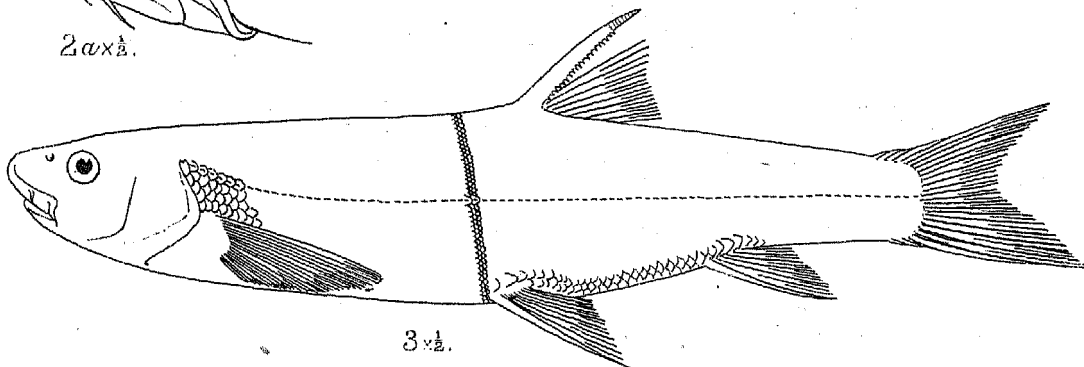
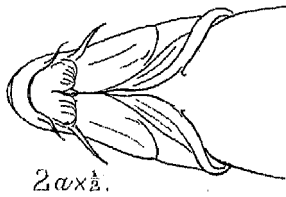
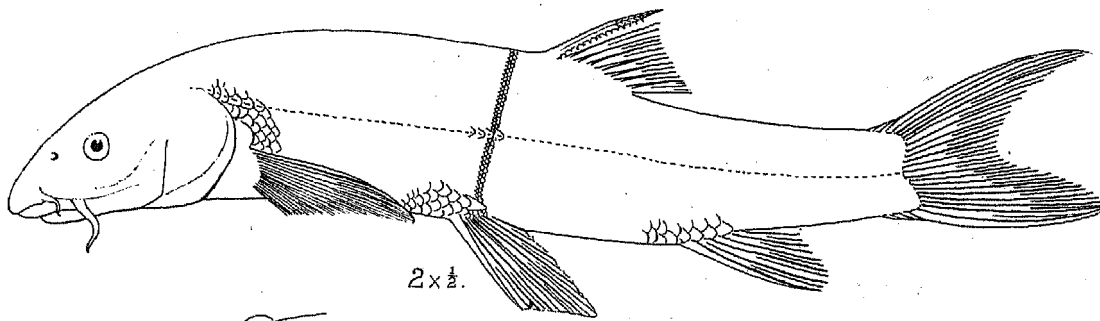
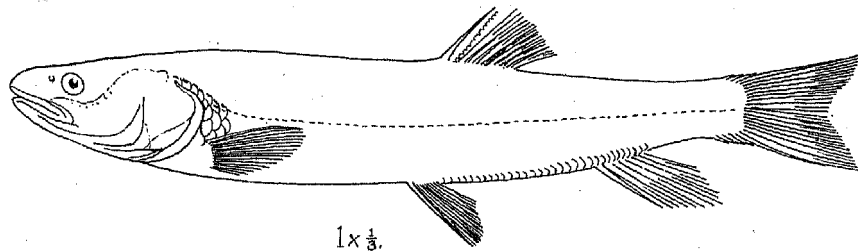
Tadpole of *Rana vicina*, Stoliczka—

Total length (specimen without legs) 43 mm.; length of tail 30 mm.; greatest breadth of body 8 mm.; greatest depth of tail 8 mm.; of caudal muscles 5 mm. Head and body moderately flat; eyes far apart; nostrils nearer the eyes than the tip of the snout; eyes and nostrils dorsal; spiracle sinistral, pointing upwards and backwards; vent opening on the right side; caudal fin commencing in front of the base of the hind limbs, continued round the tail to the anus, sharply pointed at the tip. Lips very large, considerably larger than those of the tadpole of *R. pleskii*, resembling those of *R. liebigii* in extent; the lower lip fringed completely, the upper lip only at the corners; both jaws serrated; upper jaw in two parts, without enlarged teeth at the sides; dental formula

$$\frac{1}{1+1}$$

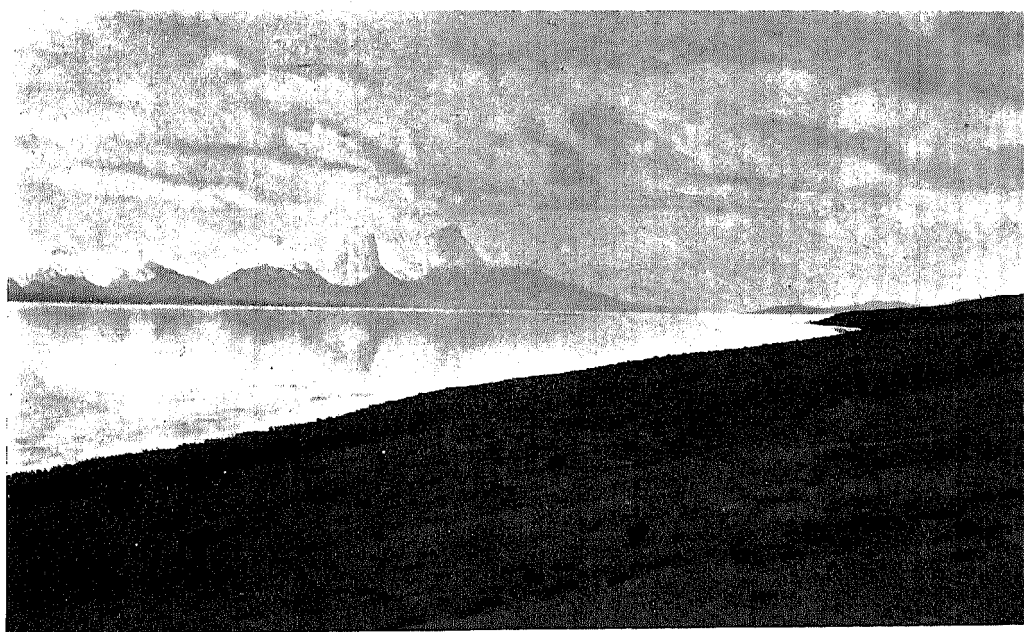
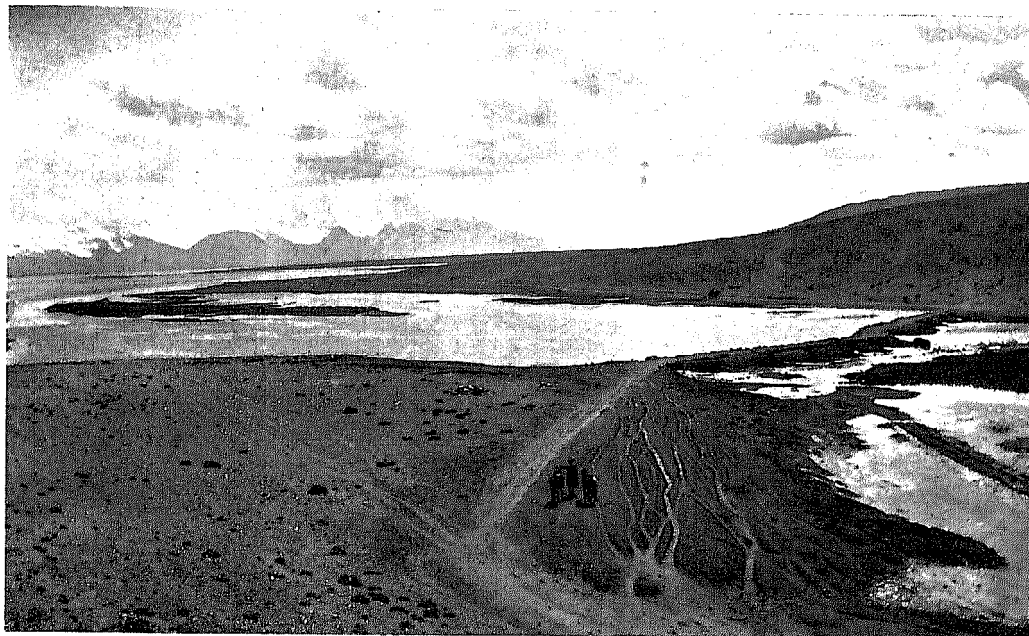
a minute, round papilla, bearing horny teeth, exists on either side between the uppermost row and the first of the double rows on the upper lip. Colour brownish, more or less distinctly mottled and spotted, paler below.

The dental formula of the tadpole of *R. liebigii* (Annandale, *Journ. Asiat. Soc. Bengal*, 1906, p. 290) is $\frac{3}{5+5}$; otherwise the larva of this species is much like that of *R. vicina*.



1. *Schizopygopsis stewartii*, Lloyd.
2. *Oreinus baileyi*, Lloyd

A.C. Chowdhary, Lith & Del.
3. *Schizothorax o'connori*, Lloyd.
4. *Schizothorax macropogon*, Regan.



F. H. Stewart, Photo.

Survey of India Office, Calcutta, 1908.

TWO VIEWS OF THE RAM-TSO FROM THE NORTH.