

ON A COLLECTION OF FISH FROM AFGHANISTAN.

BY

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(With a plate and 4 text-figures)

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In 1933, in the *Journal* of the Society an account was given of the fish of Afghanistan (vol. xxxvi, No. 3, pp. 688-706, 2 pls. and 2 text-figs.) and a small collection of five specimens was dealt with. During 1933, Sir Richard Maconachie, Major A. E. Farwell and Capt. E. W. Fletcher sent further material from Afghanistan to the Bombay Natural History Society which was kindly forwarded to me by Mr. S. H. Prater for examination and report. I am deeply indebted to these gentlemen for affording me an opportunity to report on a very valuable collection which has helped greatly in understanding the precise specific limits of a number of McClelland's hitherto ill-defined species from this country. Sufficient stress cannot be laid on the fact that, with the increased knowledge of the ichthyology of Afghanistan, the taxonomy and geographical distribution of the Central Asiatic fishes will become clear, and it will then be possible to standardise the classification of the fishes of this vast region.

The collection reported below was made at different places in all the three main river basins of Afghanistan: namely, those of the Kabul, the Helmand and the Oxus. At my request the collectors have supplied short ecological notes on the various localities in which the fish were collected and I propose to give below a list of these stations with the names of species collected therefrom.

KABUL SYSTEM.

1. *Sar-i-Chashma*.—'The head springs of the Kabul river. Bottom stony, water clear and swift. Water cress and such like vegetation on the banks' (Major A. E. Farwell).

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| i. <i>Oreinus sinuatus</i> var. <i>griffithii</i> McClell. | 1 specimen. |
| ii. <i>Nemachilus griffithii</i> var. <i>afghana</i> , nov. | 4 specimens. |

2. *Chahiltran stream*.—'A tributary of the Kabul river about 6 miles west of the Kabul City. The small stream has a pebbly bottom and has water cress and such like vegetation on its banks (Sir R. Maconachie).

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| i. <i>Nemachilus griffithii</i> var. <i>afghana</i> , nov. | 1 specimen. |
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3. *Logar river*.—'Has a muddy bed and somewhat sluggish current. Runs through cultivation,—rice, wheat and barley predominating. No information as to where fish were caught, but believed to be in a pool' (Major A. E. Farwell). The Logar river is a tributary of the Kabul river; it arises in the Gul-Koh on the south

about 70 miles west of Kabul and joins the Kabul river about 10 miles below Kabul City. It has a length of about 200 miles and at its junction is as large as the Kabul river itself.

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| i. <i>Schizothorax intermedius</i> McClell. | 2 specimens. |
| ii. <i>Schizothorax chrysochlora</i> (McClell.). | 2 specimens. |

HELMAND SYSTEM.

1. *Helmand river* (no definite locality is indicated).

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| i. <i>Nemachilus farwelli</i> , sp. nov. | 1 specimen. |
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2. *Sar-i-Bulak stream*.—A tributary of the Helmand river 'approximately 100 miles due west of Kabul as the crow flies. Pebbly bottom, clear water, swift current. Little vegetation but barley and lucerne cultivation in places' (Major A. E. Farwell).

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| i. <i>Nemachilus</i> sp. prox. <i>griffithii</i> Günther. | 17 specimens. |
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OXUS SYSTEM.

1. *Darra Ashraf and Margh streams*.—'Mountain rivers on the north side of Hindukush. Rocky, stony bottoms, clear water and swift current. They join the Bamain river (there known as Surkhab) at Tala which is roughly 85 miles north-west of Kabul as the crow flies' (Major A. E. Farwell).

a. *Darra Ashraf*:—

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| i. <i>Salmo trutta aralensis oxianus</i> Kessler. | 2 specimens. |
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b. *Margh*:—

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| i. <i>Salmo trutta aralensis oxianus</i> Kessler. | 1 specimen. |
| ii. <i>Alburnoides bipunctatus</i> var. <i>cichuvaldi</i> (Filippi). | 1 specimen. |

2. *Anderab river at Banu*.—The Anderab river 'rises on north-west side of Hindukush at Khawak Pass (35°40' N., 69°45' E.). Flows due west through Banu to Doshi (35°40' N., 68°40' E.) where it joins Surkhab which flows north into Oxus at about Kudukh Toba (37° N., 68°20' E.). Bed rocky at Banu with a few deep pools. Current very rapid and water in July was very discoloured owing to irrigation of rice fields which line the banks. Willow fairly numerous along the banks, mulberry trees further inland. The two fish were taken in a small shallow backwater' (Capt. E. W. Fletcher).

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| i. <i>Glyptosternum reticulatum</i> McClell. | 1 specimen. |
| ii. <i>Barbus capito conocephalus</i> × <i>Schizothorax</i> sp. (Hybrid). | 1 specimen. |

Capt. E. W. Fletcher has kindly supplied the following additional notes on the fish fauna of the Anderab river:—

'Local fishermen catch many "Chush"¹ in this stream with

¹ So far as my information goes, the local name 'Chush' or 'Choosh' is used in Kashmir for *Schizothorax micropogon* Heckel, though Heckel gave 'Ramghurdi' as its local name. *Sch. micropogon* is probably not found outside the Kashmir Valley, but it seems likely that in the name 'Chush' Capt. Fletcher makes a reference to a species of *Schizothorax*, of which, unfortunately, he did not collect a specimen. In the fishes collected by him from the Anderab river at Banu, there is a hybrid between a *Barbus* and a *Schizothorax* and it seems likely that both the genera are well represented in the Anderab river.

mulberries and they also catch trout¹ with slices of "Chush" on a hook. Twelve miles south of Banu lies the Arzu pass from which a small stream of the same name flows north to join the Anderab at Banu. This stream contains no "Chush" but is full of Oxus trout. About 6 miles from Banu it flows through a narrow gorge where there are many rocks. The current here is very swift and trout abound. In July 1933 trout were taken easily on locusts and averaged $\frac{1}{2}$ to $\frac{3}{4}$ lb., running up to $1\frac{1}{2}$ lb. Only one was taken on a fly. The vegetation consisted chiefly of grass and small scrub bushes, but rice cultivation and willow trees lined the banks up to about 3 miles north of Banu.

'At Khinjan (35°40' N., 68°50' E.) the Khinjan River flows into the Anderab from the south. This stream holds "Chush" certainly up to 3 miles from its junction with the Anderab. The vegetation consists chiefly of mulberry trees with some fields near the junction. Higher up, the banks are lined with small bushes and grass. About 14 miles from Khinjan trout were taken on fly in July. They averaged $\frac{1}{2}$ lb. to $\frac{3}{4}$ lb. and ran up to $1\frac{1}{2}$ lb. The stream was very swift and rocky. There were few locusts to be seen here and, in contradistinction to the Arzu stream, the trout would not look at them.'

It will be seen from the above that the collection dealt with here comprises only 34 specimens belonging to nine species or varieties and a hybrid form. Through the kindness of Dr. C. Tate Regan and Mr. J. R. Norman, a type-specimen of *Nemachilus griffithii* was sent to me for study and I have availed myself of this opportunity to add a few further notes on the species and to give a drawing of the specimen. The specimens from the Paghman river described under this specific name in 1933, as well as those obtained at Sar-i-Chashma and in the Chahiltran stream as noted above, are separated into a new variety *afghana* of *N. griffithii*. A very characteristic new species of *Nemachilus* is described from the Helmand river. *Schizothorax chrysochlora* (McClelland) is described in detail for the first time, and the probable specific limits of *Sch. intermedius* McClelland are indicated. *Orcinus sinuatus* var. *griffithii*, *Alburnoides bipunctatus* var. *cichwaldi*, *Salmo trutta aralensis oxianus*, and *Glyptosternum reticulatum* are recorded from new localities. A full description of a hybrid form between a *Barbus* and a *Schizothorax* is given.

Through the generosity of the Bombay Natural History Society it has been possible to illustrate the paper adequately, and I have great pleasure in offering my sincerest thanks to Mr. S. H. Prater for his kind interest. Mr. R. Bagchi has delineated the fishes under my supervision with his usual skill and care, and my best thanks are due to him for this.

The material is preserved in the collection of the Zoological Survey of India, with the exception of a few specimens of loaches sent to the British Museum (Natural History). The types are deposited in the Indian Museum.

¹ The commonest trout in these parts is *Salmo trutta aralensis oxianus* Kessler.

Salmo trutta aralensis oxianus Kessler.

1842. *Salmo orientalis*, McClelland (*nec* Pallas), *Calcutta Journ. Nat. Hist.* ii, 585.
 1843. *Salmo orientalis*, McClelland (*nec* Pallas), *Calcutta Journ. Nat. Hist.* iii, pp. 283-287.
 1874. *Salmo oxianus*, Kessler, 'Pisces' in Fedtschenko's *Reise in Turkestan*, p. 35.
 1932. *Salmo trutta aralensis* Berg *morpha fario* L., Berg. *Poiss. Eaux Douces de l' U.R.S.S. et des Pays Limitrophes* 3rd. Edition, i, p. 161 (See earlier references).
 1933. *The Bamean Trout*, Hora, *Journ. Bombay Nat. Hist. Soc.* xxxvi, pp. 700-705, pl.-figs. 3 & 4, 2 text-figs.

In the recent collection of fish from Afghanistan, there are 3 specimens of the Bamean Trout, the largest is about 150 mm. in total length. Two of these were caught in the Darra Ashraf and one in the Margh stream. These two streams are 4 miles apart and run into the Surkhab river (Bamean river) which is a tributary of the Oxus.

Through the kindness of Prof. L. Berg, the Zoological Survey of India now possesses one of the typical specimens of *Salmo oxianus* Kessler (No. 2840 of the Zoological Museum at Leningrad). It is 208 mm. in total length and is in a very good state of preservation. It was obtained from 'Kyzyl-su river, Basin of the Upper Amu-darya, Alai Valley, Pamir'. A comparison between this and the Afghanistan specimen has shown that they are absolutely identical with the exception of such characters which are liable to vary with the length of the individuals.

The specimens from Afghanistan are in the Parr state and possess the characteristic colouration.

The vernacular name of the trout is *Māhī-i-Khāldār* which literally means 'a fish with spots'. I am informed that in standard Persian it is called *māhī-i-qizil-ālā* 'the red-speckled fish' and in the Turkish-speaking provinces of Persia *āla-bāliq* 'the spotted fish'. The Afghan name (not Kabuli but Persian) is, in view of the characteristic colouration, very appropriate.

Glyptosternum reticulatum McClelland.

1933. *Glyptosternum reticulatum*, Hora, *Journ. Bombay Nat. Hist. Soc.* xxxvi, p. 697 (see for earlier references).

A fine specimen of *Glyptosternum reticulatum*, 196 mm. in total length, was collected by Capt. E. W. Fletcher from the Banu Andrab river, about 79 miles north of Kabul at an altitude of 4,300 ft. The entire dorsal and lateral surfaces of the fish are reticulated with blackish spots and markings, and it is likely that such a colour-pattern may have been responsible for the specific name *reticulatum*. The caudal fin and the distal half of the anal fin are more deeply pigmented. The ventral surface in front of the ventral fins is roughened by small and hard papillae. The adipose dorsal is well developed, it is as long as the tail portion of the body without the caudal fin and its height is equal to half the width of the mouth.

In the group of the Sisorid fishes to which *Glyptosternum* belongs, a new genus—*Oreoglanis*—has been described recently by Smith.¹ To indicate the relationship of this genus, he has given a key to the genera of Glyptosternoid cat-fishes. Moreover, he has indicated that, as already pointed out by me,² *Paraxostoma* Regan is synonymous with *Glyptosternum* McClelland.

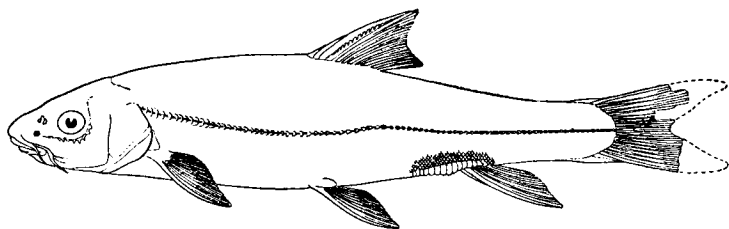
G. reticulatum has recently been found at two different places within the limits of Afghanistan.

Schizothorax intermedius McClelland.

1842. *Schizothorax intermedius*, McClelland, *Calcutta Journ. Nat. Hist.* ii, p. 579.

1868. *Schizothorax intermedius*, Günther, *Cat. Fish. Brit. Mus.* vii, p. 165.

In grouping species of *Schizothorax*, McClelland included *Sch. intermedius* and *Sch. esocinus* among those forms in which the lower lip presents 'a free reflected margin only at the angles of the mouth'. Besides this character, there is no other indication in the description of the former species by which it could be distinguished from the allied forms. Unfortunately McClelland did not publish any drawing of the species, so its determination would have always remained a guess-work had McClelland not sent 3 specimens of the species to the 'Museum at the India House', whence two examples (stuffed, 11 in. long and skin, 9 in. long) passed to the collection at the British Museum and served for the description of the species by Günther in his *Catalogue of Fishes*. I have no doubt that Günther had before him the typical specimens of the species. In the collection of fish from Afghanistan, there are two specimens—badly preserved and somewhat damaged—which agree very closely with Günther's description of *Sch. intermedius*. These were collected in the Logar river, a tributary of the Kabul river, to the south of Kabul. It is significant that the original specimens of the species were collected by Griffith in the Kabul river at Jallalabad and in the Tarnuck river.



Text-fig. 1.—Lateral view of *Schizothorax intermedius* McClelland. $\times \frac{1}{2}$.

From Günther's description of *Sch. intermedius* and from an examination of specimens before me, the following salient characters of the species may be mentioned:—

- (i) Lower labial fold interrupted in the middle.

¹ Smith, *Journ. Siam Soc., Nat. Hist. Suppl.* ix, pp. 70-74, pl. iii, 1 text-fig. (1933).

² Hora, *Ann. Mag. Nat. Hist.* (10) x, pp. 176-179 (1932); *Cur. Sci.* i, p. 130 (1932).

- (ii) Commencement of dorsal fin nearly midway between the tip of the snout and the base of the caudal fin.
- (iii) Eyes situated not entirely in the anterior half of the head.
- (iv) Anal scales not much developed, the largest being scarcely half as broad as the orbit.
- (v) Height of head at occiput considerably greater than its width.
- (vi) Body without spots.

A perusal of the literature shows that a very wide interpretation has been given to *Sch. intermedius* and that several unrelated forms have been designated by this title. The confusion seems to have been started by Day,¹ who, in 1876 and 1878, described and figured specimens from Kashgar, Yangihissar and Sirikol as *Sch. intermedius*. I have examined some of these specimens in the collection of the Indian Museum, and find that in all of them the eye is situated entirely in the anterior half of the head, and that the anal scales are relatively larger. The dorsal spine is stronger and more coarsely serrated, and the scales are relatively much larger in size. Herzenstein² relegated *Sch. aksaiensis* Kessler and *Sch. affinis* Kessler to the rank of the subspecies of *Sch. intermedius* and described *malacorrhynchus* as a new subspecies. Berg³ in his latest work has given a comprehensive scheme of classification of the various subspecies of *Sch. intermedius*. I am unable to agree to the system proposed by Berg, and in the absence of sufficient material of the Central Asiatic forms associated with McClelland's species, I am unable to define the specific limits of these forms. In order to facilitate reference, I give below a table of measurements of the two specimens, but it has to be understood that, due to the damaged condition and poor preservation of the specimens, some of the measurements are likely to be faulty.

Measurements in millimetres

Total length without caudal ...	...	...	96.0	156.0
Length of head ...	...	...	25.0	38.0
Height of head ...	...	...	15.2	25.8
Width of head ...	...	...	13.3	22.2
Length of snout ...	...	...	9.0	13.8
Diameter of eye ...	...	...	6.8	6.7
Interorbital width ...	...	...	7.8	13.5
Depth of body ...	...	...	18.5	30.0
Longest ray of dorsal ...	...	...	19.0	28.0
Longest ray of anal ...	...	...	16.5	26.8
Length of pectoral ...	...	...	19.8	28.0
Length of ventral ...	...	...	17.3	25.4
Length of caudal peduncle ...	...	...	17.3	27.0
Least height of caudal peduncle ...	...	...	8.5	14.5

¹ Day, *Proc. Zool. Soc. London*, p. 786 (1876); *Ichthyology, Sci. Res. 2nd Yarkand Miss.*, p. 5 (1878).

² Herzenstein, 'Fische', in *Wiss. Res. Przewalski Central As. Reis. Zool. Theil*, iii (2), pp. 106-117 (1889).

³ Berg, *Poissons des Eaux Douces de l' U.R.S.S.*, i, pp. 458-462 (1932). See earlier references.

Local name:—The two specimens of *Sch. intermedius* were sent with the two specimens of the following species under the common name *Sheer-Māhi*.

Schizothorax chrysochlora McClelland.

(Pl.-fig. 4; text-fig. 2.)

1842. *Racoma chrysochlora*, McClelland, *Calcutta Journ. Nat. Hist. Soc.* ii, p. 577, pl. xv, fig. 2.

Schizothorax chrysochlora was described by McClelland from Mr. Griffith's notes and the figure is stated to have been 'reduced from his very excellent drawing'. The diagnosis of the species is very poor and of a generalized nature. It reads as 'Mouth directed forward, intermaxillaries protractile, without spots, scales small, raised on the lateral line, vertical anal scales large, colour brownish yellow, operculum square behind, intestine convoluted in a conical form in the anterior part of the abdomen, and equal to six lengths of the body'. *Sch. chrysochlora* is stated to grow to a length of 10 inches and was collected in the Kabul river at Lalpore. At Lalpore, Mr. Griffith 'procured a fish I believe identical with the nepoora of Assam, *C. falcatus* of Hardwicke, a Barbus, a Gonorhynchus, a small Mahasir, and a remarkable fish, which appears to me the type of types of Carnivorous *Poeconominae*'. It would thus appear that *Sch. chrysochlora* was obtained from the lower region of the Kabul river where there is a mixture of the Indian and Central Asiatic species of fishes. Under the description of *Racoma labiatus*, McClelland says: 'Mr. Griffith remarks that this singular form is nearly allied to the Lalpore species, but that the intestines of the latter are infinitely longer, nor is there any enlargement of the lips in the latter; but this last character Mr. Griffith remarks is not so remarkable in young specimens'. It is this indication of a close similarity between *labiatus* and *chrysochlora* that has helped me in assigning two badly preserved and damaged specimens from the Logar river, a tributary of the Kabul river, to *Sch. chrysochlora*. *Sch. labiatus* is the commonest species in the Chitral Valley, whence my colleague, Dr. B. N. Chopra, obtained a large series of nicely preserved specimens. This material has proved very useful in studying the form referred to as *Sch. chrysochlora* by McClelland.

In 1876, Day¹ described and two years later figured certain specimens collected by the Second Yarkand Mission at 'Kashghar, Yangihissar, and Yarkand' as *Sch. chrysochlorus*. In the collection of the Zoological Survey of India, there are several specimens purchased from Day and labelled as *Sch. chrysochlorus*. In these specimens the eye is entirely in the anterior half of the head, which is low and elongate. The snout is also very long and the fold of the lower lip does not extend beyond the symphysis. The anal scales are but little developed. In McClelland's *Sch. chrysochlora* the vertical anal scales are large and the fold of the lower lip is

¹ Day, *Proc. Zool. Soc. London*, p. 784 (1876); *Sci. Res. 2nd Yarkand Miss.*, Ichthyology, p. 3, pl. i, fig. 2 (1878).

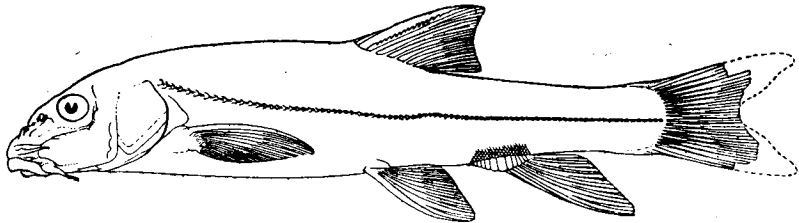
free throughout and somewhat trilobate as in *Sch. labiatus*. It would thus appear that Day's identification of the Yarkand Mission specimens as *Sch. chrysochlora* was not correct and that they in reality belong to *Sch. biddulphi* Günther.¹

It would thus appear that since its discovery, *Sch. chrysochlora* has remained unknown and that both the description and figure of it by McClelland have not proved sufficient for elucidating its precise specific limits. Günther² included it among other ill-defined species of *Schizothorax*, and in 1889³ doubted the use of the name by Day for a species from Yarkand. This point was elaborated by Herzenstein⁴ who showed that Day was not justified in applying McClelland's name *Sch. chrysochlora* to a species so different from McClelland's original form.

From McClelland's original description and figure of *Sch. chrysochlora*, the following salient features may be noted, though the description is certainly very meagre and applicable 'to more than one species of *Schizothorax*' as remarked by Günther.

- (i) Body without spots.
- (ii) 'Scales small, raised on the lateral line, *vertical anal scales large*' (italics are mine).
- (iii) The head is short and high.
- (iv) The eye is situated almost in the middle of the length of the head.
- (v) The species is found in the lower reaches of the Kabul river where certain species of the Indian fauna are also found.

The two specimens before me agree in all these points with McClelland's description, but unfortunately they are not in a good state of preservation and, therefore, a detailed description cannot be given. Attention may, however, be directed to some of the salient features to facilitate reference in future.



Text.-fig. 2.—Lateral view of *Schizothorax chrysochlora* (McClelland). $\times \frac{1}{2}$.

¹ Günther, *Ann. Mag. Nat. Hist.* (4), xvii, p. 400 (1876).

Schizothorax biddulphi was described by Günther from two skins, the larger being 15.5 in. long. In Day's specimens and description of *Sch. chrysochlorus* the length of the head is about $4\frac{3}{4}$ to $5\frac{1}{2}$ in the total length, but Günther says 'one-fifth of the total (without caudal)'. Günther usually excluded the caudal fin in giving the total length, but in this case I believe he meant to say 'with caudal'. In all other respects Day's *Sch. chrysochlorus* and Günther's *Sch. biddulphi* appear to be almost identical.

² Günther, *Cat. Fish. Brit. Mus.*, vii, p. 162 (1868).

³ Günther, *Trans. Linn. Soc. London* (2), v, p. 107 (1889).

⁴ Herzenstein, 'Fische', in *Wiss. Res. Przewalski Central Asi. Reis. Zool. Theil*, iii (2), pp. 154-156 (1889).

D. 3/8; A. 3/5; P. 20; V. 10.

The dorsal profile rises abruptly from the tip of the snout to the nape and then gently to the base of the dorsal fin beyond which it slopes down to the base of the caudal fin. The ventral profile in front of the anal fin is almost straight or only slightly arched. The ventral surface of the head and the anterior part of the body is somewhat flattened. In the larger specimen, the maxillaries are protruded and the length of the head cannot be ascertained accurately. The length of the head is contained from 3.5 to 3.7 times in the total length without the caudal. The width of the head is contained 1.7 to 1.8 times and the height of the head 1.6 to 1.7 times in its length. The eye is dorso-lateral in position and is barely visible from the ventral surface; in the smaller specimen it is situated considerably nearer to the tip of the snout than to the posterior margin of the operculum, but in the larger specimen the eye is almost in the middle of the length of the head. The diameter of the eye is contained 4.7 to 5.0 times in the length of the head, 1.5 to 2.3 times in the length of the snout and 1.2 to 1.6 times in the interorbital width. These proportions indicate that the eyes undergo considerable variation both in size and position with the growth of the fish. The interorbital space is broad and flattened. The mouth is subterminal, transverse and arched; it is bordered by thick lips which are continuous all round the mouth so that the reflected posterior margin of the lower lip is entire. In the larger specimen, this labial fold is trilobed. The edge of the lower jaw is sharp and strong, and is covered with a horny covering. The barbels are subequal and longer than the diameter of the eye. The depth of the body is contained 5.2 times in the total length without the caudal. The scales are small, but those on the lateral line are somewhat larger and raised. There are several transverse rows of larger scales behind the gill-opening, and the anal scales are almost as long as half the diameter of the eye. The ventral surface between the pectorals is devoid of scales. The lateral line is complete and runs to the middle of the base of the caudal fin.

The dorsal fin arises slightly in advance of the ventrals and its commencement is considerably nearer the base of caudal than the tip of the snout. The last dorsal spine is bony, but quite flexible in the distal one-third of its length, and is serrated along the posterior border. The longest ray of the dorsal fin is shorter than the depth of the body. The pectoral, ventral and anal fins are long and pointed, but none of these fins, when laid flat, reaches the one following it. The caudal fin is damaged in both the specimens, but McClelland's figure shows it to be a deeply bifurcate structure. The anal opening is situated just before the anal fin. There is an adnate scaly appendage in the axil of the ventral fin. The caudal peduncle is about 1.7 to 1.9 times as long as its least height.

The colour is greyish above the lateral line, pale-olivaceous below it and much lighter on the ventral surface.

Remarks.—As remarked by Griffith, *Sch. chrysochlora* has much in common with *Sch. labiatus* McClelland, and especially with those specimens of the latter in which the labial fold is not well-developed. I have dealt with the variation exhibited by *Sch. labiatus* in my report on the Chitral Fishes published in the *Records of the Indian Museum*. I have compared the larger specimen of *Sch. chrysochlora* with a specimen of the same size of *Sch. labiatus* with the following results:—

In *Sch. labiatus* the body is more slender and the head is considerably pointed; the labial fold is well-developed and prominently trilobed, the commencement of the dorsal fin is almost midway between the tip of the snout and the base of the caudal fin, and the anal scales are very small, considerably less than half the diameter of the eye. It is thus seen that the two species can be readily distinguished from each other.

*Measurements in millimetres.*¹

Total length without caudal ...	...	...	94.5	177.0
Length of head ...	...	...	26.3	47.0
Height of head ...	...	...	15.0	29.6
Width of head ...	...	...	14.2	26.5
Length of snout ...	...	...	9.5	21.0
Diameter of eye ...	...	...	5.6	9.3
Interorbital distance ...	...	...	6.7	15.3
Depth of body ...	...	...	18.0	31.0
Longest ray of dorsal ...	...	...	17.4	32.0
Longest ray of anal ...	...	...	15.7	31.0
Length of pectoral... ..	...	...	18.2	34.3
Length of ventral ...	...	...	15.0	32.0
Length of caudal peduncle ...	...	...	16.0	30.8
Least height of caudal peduncle ...	...	...	9.0	16.0

Local name.—*Sch. chrysochlora* is locally known as *Sheer Mahi*, which literally means milk-fish or sweet-fish. It seems to be a common name for species of *Schizothorax* in Afghanistan, and in this reference is made probably to the taste of the flesh of these fishes.

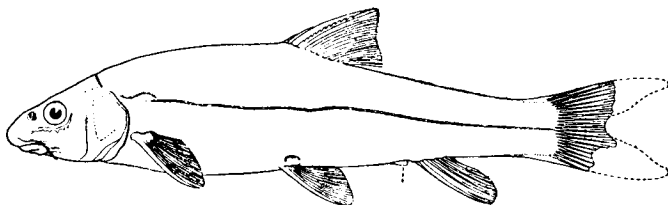
¹ On account of the protruded condition of the upper jaw and poor condition of preservation of the specimens, the measurements are likely to be faulty in certain cases, and should, therefore, be taken with considerable reserve.

Oreinus sinuatus var. **griffithii** McClelland

(Plate-fig. 3; text-fig. 3.)

1933. *Oreinus sinuatus* var. *griffithii*, Hora, *Journ. Bombay Nat. Hist. Soc.* xxxvi, p. 700.

In the collections of fish made in Afghanistan during 1933, there is a single specimen of the genus *Oreinus*, which I refer to *O. sinuatus* var. *griffithii*. The specimen was collected by Major A. E. Farwell at Sar-i-Chashma, the source of the Kabul river; it is 136.5 mm. in length without the caudal and is in a fine state of preservation. In my article¹ on the fish of Afghanistan, reasons were given for regarding the Kabul river form as distinct from *O. sinuatus*, though both are very much alike superficially. I have described this form in detail in my account of the fish of Chitral which will be published in the *Records of the Indian Museum*.



Text-fig. 3.—Lateral view of *Oreinus sinuatus* var. *griffithii* McClelland.

The following note from Griffith's observations is of special significance. Writing of the fish fauna of the Kabul river, he says: 'Towards its origin, and throughout the upper part of the Mydan Valley, a species of *Oreinus* is very abundant, numbers may be taken with a worm, the only instance I know of a fish with a Gonorhynchoid mouth taking bait. This same species swarms in the fine springs (from limestone) at Sar-i-Chashmah, which are the main source of the river; the fish are considered sacred, and appear to eat anything presented to them; the size does not exceed 5 lbs.'²

Alburnoides bipunctatus var. **eichwaldi** (Filippi).

1932. *Alburnoides bipunctatus eichwaldi*, Berg, *Poiss. des Eaux Douces U.R.S.S.*, i, p. 493 (see synonyms).

There is a single specimen, 74 mm. in length without the caudal, which I assign to *Alburnoides bipunctatus* var. *eichwaldi*. It was collected from the Margh river, a tributary of the Surkhab river. It has already been indicated³ that this is one of the species commonly found in the Upper Amudaria.

The fish is locally known as *Māhi putrā*.

¹ Hora, *Journ. Bombay Nat. Hist. Soc.*, xxxvi, p. 700 (1933).

² Griffith, *Calcutta Journ. Nat. Hist. Soc.*, ii, p. 564 (1842).

³ Hora, *Journ. Bombay Nat. Hist. Soc.*, xxxvi, p. 706 (1933).

Barbus capito conocephalus Kessler × **Schizothorax** sp.

(Plate-figs. 5 & 6.)

In the small collection made by Capt. E. W. Fletcher in July 1933 from the Banu Anderab river, there is a small fish, 95 mm. in total length, which appears to be a hybrid between *Barbus capito conocephalus* and some species of *Schizothorax*. In general facies, it resembles the fishes of the subfamily *Schizothoracinae*, but possesses relatively larger scales. The lower jaw is bare anteriorly and the lip is somewhat papillated, so that the ventral surface of the head gives the appearance of a young *Orcinus*. A somewhat similar hybrid—*Barbus capito conocephalus* × *Schizothorax pseudak-saiensis issykkuli*—has been figured by Berg,¹ but, as compared with it, the head in the specimen under report is relatively short, high and much more rounded anteriorly. From the build of its head, it seems likely that the Afghanistan specimen is the result of crossing of the species of *Barbus* referred to above and *Schizothorax irregularis* (Berg, *Sch. intermedius irregularis*, l.c., p. 460, fig. 385), but in the absence of sufficient material, it is not possible to be dogmatic about this suggestion. The interesting specimen is, however, described and figured here for future reference.

D. 3/8; A. 2/5; P. 15; V. 9; C. 20, besides smaller rays at the sides.

The specimen is subcylindrical with a short and rounded head. The ventral surface of the head is somewhat flattish and both the profiles are only slightly arched. The length of the head, of the caudal fin and the depth of the body are equal and are contained 5 times in the total length and 4 times in the length without the caudal. The width of the head is contained 1.6 times and the height of the head at the occiput 1.4 times in the length of the head. The eyes are large, dorso-lateral in position and hardly visible from the ventral surface; they are mostly situated in the anterior half of the head. The diameter of the eye is contained 3.8 times in the length of the head and 1.2 times in the length of the snout and the interorbital width. The nostrils are situated near the antero-superior border of the eye. The mouth is transverse, semicircular and inferior; it is bordered by flat lips which are continuous at the angles of the mouth; the labial fold is interrupted in the middle; the flat, lower lip is finely papillated. The distal portion of the upper jaw is vertical and, when the mouth is closed, it lies in front of the lower jaw, which is hard, sharp and shovel-shaped for rasping purposes. A portion of the lower jaw is not covered by the lip anteriorly. There are two pairs of well-developed barbels, both longer than the diameter of the eye.

The base of the dorsal fin is midway between the anterior border of the eye and the base of the caudal fin; its longest ray is not as high as the depth of the body below it. The last spine is bony, but weak, and strongly denticulated posteriorly; there are about a dozen pair of teeth along the posterior border. The dorsal fin

¹ Berg, *Poisson des Eaux Douces U.R.S.S.*, 3rd ed., i, p. 450 (Leningrad: 1932).

commences considerably in advance of the ventrals. The pectoral fins are long and pointed, but do not extend as far as the base of the ventrals, which are similar to the pectorals and do not reach the anal-opening. The anal fin, when adpressed, does not reach the base of the caudal fin. The caudal fin is deeply forked and the lobes are sharp and pointed; the upper lobe is slightly longer than the lower. The caudal peduncle is 1.4 times as long as its least height.

The lateral line is complete and runs to the middle of the base of the caudal fin. The scales are small and imbricate. There are about 82 rows of scales in a longitudinal series, 14 between the lateral line and the commencement of the dorsal and 11 rows between the lateral line and the base of the ventral. There is a fleshy appendage in the axil of the pectoral fin, but none above the base of the ventral fin. The anal-opening and the anterior part of the base of the anal fin are provided with rows of somewhat larger scales. On the ventral surface the scales are embedded in the skin and there are only faint indications externally.

The colour is grayish above and pale-olivaceous below. The sides are marked with small, irregular patches of black colour which usually characterize the young *Schizothoracinae*.

Measurements in millimetres.

Total length including caudal	...	...	...	95.0
Length of caudal	...	...	...	19.0
Depth of body	...	...	...	19.0
Length of head	...	...	...	19.0
Width of head	...	...	...	11.8
Height of head at occiput	...	...	...	13.5
Length of snout	...	...	...	6.0
Diameter of eye	...	...	...	5.0
Interorbital width	...	...	...	6.0
Longest ray of dorsal	...	...	...	16.0
Longest ray of anal	...	...	...	13.0
Length of pectoral	...	...	...	16.0
Length of ventral	...	...	...	13.3
Length of caudal peduncle	...	...	...	14.0
Least height of caudal peduncle	...	...	...	9.8

GENUS: **Nemachilus** van Hasselt.

(Plate-figs. 1 & 2; text-fig. 4.)

The species of the genus *Nemachilus* are so numerous and the characters by which they are usually differentiated are so variable

that considerable difficulty has often been experienced in separating one form from the other. This is specially so in the case of related species. The Nemachili from Afghanistan have hitherto proved to be a very confusing lot, but an attempt is made here to elucidate the precise limits of the various forms.

In 1929¹ attention was directed to the type material of two loaches from Afghanistan in the collection of the British Museum which had been erroneously stated to have come from 'Bhoutan' and 'Assam' in Günther's *Catalogue*.² Short notes were published then on the type specimens of *Adiposia boutanensis* (McClell.) and *Nemachilus griffithii* Günther, and their probable affinities were discussed. It was further stated that the former species was probably obtained in the Helmand basin near the Bolan Pass and the latter from the Arghandab river near Candahar. In 1933,³ I assigned two specimens collected in the Paghman river, a tributary of the Kabul river near Kabul, to *N. griffithii* and published a detailed account with figures. It was indicated that the Paghman specimens differed from the typical examples in several important respects, but on account of the paucity of the material and the much smaller size of the fresh specimens, it was not considered advisable to propose a new name for them. In the collection under report, there are 23 specimens of the genus *Nemachilus*, 18 from the Helmand river basin and 5 from the Kabul river basin. Of the Kabul river specimens, 4 were obtained in the spring at Sar-i-Chashma and 1 in the Chahiltran stream; and these (text-fig. 4c) correspond in every respect with the specimens already reported from the Paghman river. It may be recalled that Griffith⁴ observed a loach very common in the small channels by which the springs at Sar-i-Chashma run off. It is thus clear that in the Kabul river and its tributary streams, at least in the neighbourhood of Kabul, this particular type of loach is common, and as it differs in certain particulars from *N. griffithii*, I propose to treat it here as a separate variety which may be designated as **afghana**.

Through the kindness of Dr. C. Tate Regan and Mr. J. R. Norman, I have received on loan one of the two typical specimens of *N. griffithii* from the British Museum (Natural History). In forwarding the specimens Mr. Norman has observed that it 'differs somewhat from the other type in having a generally shorter and thicker body, shorter and less slender caudal peduncle and a rather larger head. We have little doubt, however, that in spite of these differences, the two types represent the same species'. The specimen (text-fig. 4a), which I have studied, is not in a good state of preservation, and is too flabby for accurate measurements. So far as it can be ascertained the length of the head is contained 4.7 times in the total length without the caudal, and the commencement of the dorsal

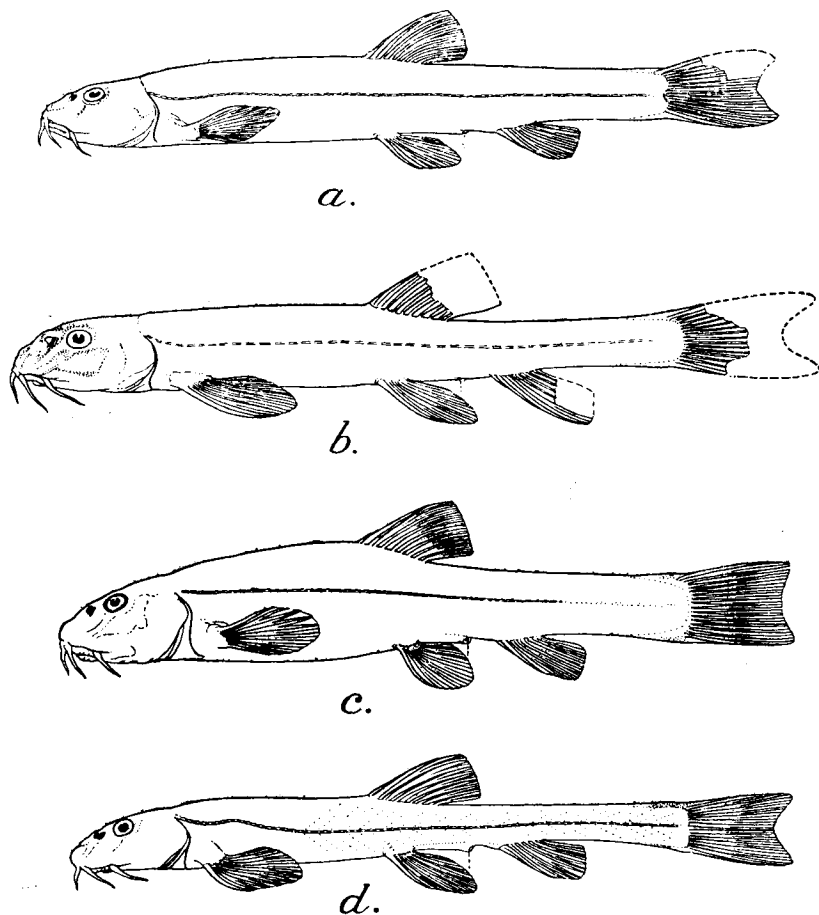
¹ Hora, *Journ. Proc. As. Soc. Bengal* (n.s.), xxiv, pp. 481-484, 1928 (1929).

² Günther, *Cat. Fish. Brit. Mus.*, vii, pp. 358, 360 (1868).

³ Hora, *Journ. Bombay Nat. Hist. Soc.*, xxxvi, pp. 697-699, pl.-figs. 1 & 2 (1933).

⁴ Griffith, *Calcutta Journ. Nat. Hist.*, ii, p. 564 (1842).

fin is nearer to the base of the caudal than to the tip of the snout. The distance between the pectoral and the ventral fins is about equal to the length of the pectoral. The least height of the caudal peduncle is contained 2.5 times in its length. The caudal peduncle



Text-fig. 4.—*Nemachilus* from Afghanistan.

Lateral view of (a) *Nemachilus griffithii* Günther, type-specimen $\times \frac{7}{3}$; (b) *Nemachilus griffithii* Günther, young specimen $\times 1\frac{1}{3}$; (c) *Nemachilus griffithii* var. *afghana*, nov., type-specimen $\times 1$; (d) *Nemachilus farwelli*, sp. nov., type-specimen $\times \frac{3}{2}$.

is muscular but is not much compressed from side to side. The diameter of the eye is contained 7.5 times in the length of the head, 3 times in the length of the snout and 1.5 times in the interorbital width. The snout is shorter than the postorbital part of the head. On comparing the above notes with the description of the species by Günther, two conclusions seem to be justified, (1) that Günther probably used the longer and narrower specimen for drawing up his description and (2) the species is subject to considerable vari-

ation in proportions, etc. It is for these reasons that I have still linked the Kabul river specimens with *N. griffithii*.

There are in the collection 17 specimens collected by Major A. E. Farwell in the Sar-i-Bulak stream, a tributary of the Helmand river, which appear to belong to *N. griffithii*. The specimens are young (Plate-fig. 1, and text-fig. 4b) and in all cases the fins are greatly damaged. However, in these examples the fins are relatively longer, the eyes are larger, the head is longer, and there are other points in which they differ from the typical examples, but, probably, all these differences are due to their juvenile state. It may, however, be indicated that these examples are very different from specimens of the same size of the form *afghana* referred to above from the Kabul river.

A fine specimen (plate-fig. 2 & text-fig. 4d) collected by Major A. E. Farwell in the Helmand river is so different in the form and shape of its caudal peduncle, general facies and proportions that it seems to represent a form hitherto undescribed. It is associated with the name of Major Farwell in slight recognition of the interest taken by the officers of the British Legation at Kabul in making known the ichthyology of this interesting region.

***Nemachilus griffithii* var. *afghana*, nov.**

1933. *Nemachilus griffithii*, Hora, *Journ. Bombay Nat. Hist. Soc.* xxxvi, pp. 697-699, pl. i, figs. 1 & 2.

Major A. E. Farwell obtained 4 young specimens ranging in length from 54 mm. to 97 mm. including the caudal fin from the springs at Sar-i-Chashma, the source of the Kabul river. Griffith¹ remarked that 'In the small channels by which the springs run off, a loach is very common'. These specimens agree very closely with the examples described by me (1933) from the Paghman river. It has to be noted, however, that the latter were not well preserved and the swollen nature of the opercular region was a mere artifact. Both the lips are fleshy and plicated; the lower lip is very narrowly interrupted in the middle. The colour varies with the size of the specimens. Along the lateral line there is either a series of rounded spots, a moniliform band or a grayish streak. The caudal fin is more or less truncate and not emarginate.

A young specimen of the species was also collected by Sir Richard Maconachie in the Chahiltran stream, a tributary of the Kabul river about 6 miles to the west of the Kabul City.

Type-specimen.—No. F $\frac{11525}{1}$, *Zoological Survey of India*, *Indian Museum, Calcutta*.

***Nemachilus farwelli*, sp. nov.**

(Pl.-fig. 2; text-fig. 4d.)

D. 2/7; A. 2/5; P. 1/11; V. 1/8; C. 16 (besides smaller rays at the sides).

¹ Griffith, *Calcutta Journ. Nat. Hist.*, ii, p. 564 (1842).

The new species of *Nemachilus*, which I have great pleasure in associating with the name of Major A. E. Farwell, Military Attaché to the British Legation at Kabul, has a very characteristic form. It is somewhat broad and depressed in the anterior region, but behind the dorsal fin it is greatly compressed from side to side. The tail portion is long and oar-like. All along the dorsal surface behind the head, the neural spines of the vertebrae form a prominent ridge. The following measurements give an idea of the form of the fish:—

Height of head in the region of eyes ...	...	...	mm.
			9.0
Height of head at occiput ...	...	...	10.6
Greatest height of body above middle of pectorals	...	...	12.7
Height of body at the commencement of dorsal fin	...	...	10.3
Height of body at the commencement of anal fin	...	...	7.8
Least height of caudal peduncle ...	...	...	6.8
Width of head in the region of eyes ...	...	...	11.7
Width of head in the opercular region	...	...	14.7
Width behind bases of pectorals ...	...	...	11.7
Width at the commencement of ventrals	...	...	6.5
Width at the commencement of anal ...	...	...	4.3
Least width of caudal peduncle ...	...	...	1.6

The dorsal profile is slightly arched, but the ventral profile is straight and horizontal throughout. The ventral surface is flattish and the paired fins are horizontally placed.

The head is depressed on both the dorsal and ventral surfaces; its length is contained 6.1 times in the total length with the caudal and 5.1 times without the caudal. The width of the head is contained 1.5 times and its height 2.1 times in its length. The snout is almost equal to the height of the head at the occiput. The eye is dorso-lateral in position and is not visible from the ventral surface; its diameter is contained 5.3 times in the length of the head, 2.4 times in the length of the snout, and 1.3 times in the interorbital width. The interorbital arc is almost flat. The nostrils are well developed and are situated much nearer the eye than the tip of the snout. The dorsal surface of the head is marked with series of lateral line organs which will be described below. The mouth is inferior, transverse and crescentic; it is situated considerably behind the tip of the snout and is co-extensive with the width of the head. The lips are well developed, fleshy and continuous at the angles; the lower lip is narrowly interrupted in the middle line. Both the lips are greatly fimbriated; the lower lip leaves the

jaw bare anteriorly. Both the jaws are strong and well developed; the anterior jaw lies in front and forms a hood-like covering over the posterior jaw which is provided with a sharp, rasping edge and is shovel-like. There are 6 barbels which are longer than the diameter of the eye; the maxillary barbels are the longest, but they are considerably shorter than half the length of the head. The gill-opening is lateral, extending for a short distance only on the ventral surface.

The body is smooth and devoid of scales; its greatest depth is contained 11 times in the total length with the caudal and 9.2 times without it. The lateral line is complete and forms a ridge-like prominence on the body. The lateral lines of the two sides are united dorsally by a transverse series of perforations along the posterior border of the head. Each lateral line is continued forwards to the middle of the eye where it is divided into two branches, the dorsal reaches the nostrils, while the ventral branch extends as far forwards as the angle of the mouth.

The dorsal fin commences slightly in advance of the ventrals, and its longest ray is considerably greater than the depth of the body below it. The commencement of the dorsal is nearer tip of snout than base of caudal; its free end is truncate. The pectorals are broad and horizontal in position; they are somewhat shorter than the head and are separated from the ventrals by a considerable distance. The ventrals are long and pointed, and extend beyond the anal opening, but do not reach the base of the anal fin; they are slightly shorter than the pectorals. The anal fin is similar to the dorsal. The caudal fin is almost as long as the head and is slightly emarginate. The caudal peduncle is oar-like; it is about 4 times as long as its least height.

The anal-opening is preceded by a tube in which there is a papilla-like structure. Between the anus and the anal fin there is a well-defined, narrow groove with raised margins. It is not possible to give the function of this structure which is very characteristic of the species.

The colouration in the spirit specimen is almost black along the dorsal surface and dirty white on the ventral surface. There are few indications of regular spots on the body below the lateral line. The dorsal and the caudal fins are marked with several indistinct bands and the other fins are also provided with a few irregular colour patches.

Locality.—Helmand river, Afghanistan.

Type-specimen.—No. F $\frac{11515}{1}$, Zoological Survey of India,

Indian Museum, Calcutta.

Remarks.—In general facies *Nemachilus farwelli* is remarkable, and though I have handled big collections of *Nemachili*, I have not come across any form approaching it in the shape of its caudal peduncle. The position of the dorsal fin and the nature of its lips are other distinguishing characters. The well-marked groove between the anus and the anal fin is also characteristic of the species. *Nemachilus farwelli* has no resemblance to the species of

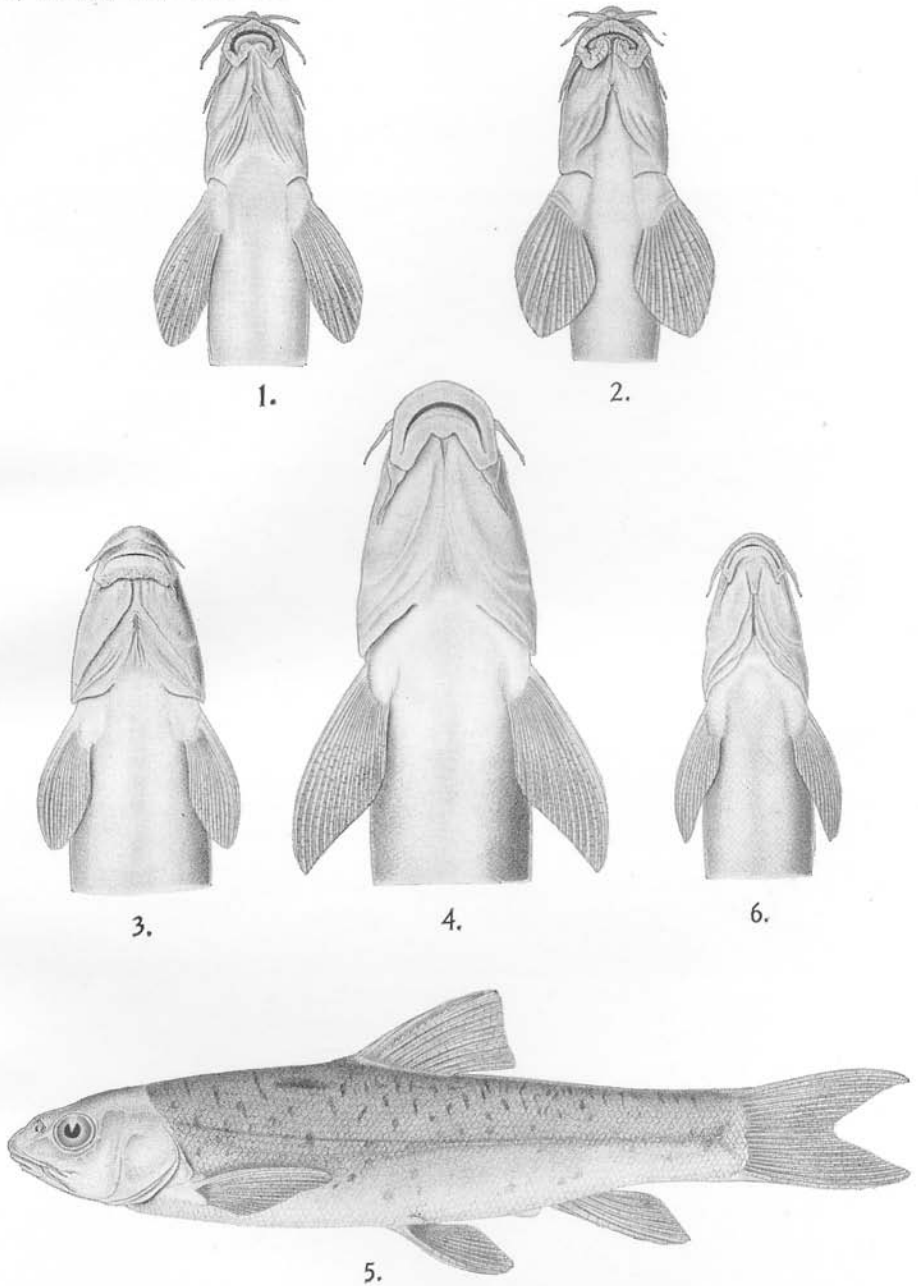
*Adiposia*¹ *A. macmahoni* (Chaudhuri), *A. rhadinaca* (Regan) and *A. boutanensis* (McClelland)—known from the lower reaches of the Helmand system. *N. tenuis* Day, which has been recorded from the Helmand river,² possesses a rounded, slender and long caudal peduncle.

Measurements in millimetres.

Total length including caudal	...	...	...	140·0
Length of caudal	...	...	...	22·0
Depth of body	...	...	...	12·7
Length of head	...	...	...	22·8
Length of snout	...	...	...	10·5
Interorbital width	...	...	...	5·5
Diameter of eye	...	...	...	4·3
Width of head	...	...	...	14·7
Height of head at occiput	...	...	...	10·6
Longest ray of dorsal	...	...	...	20·8
Length of pectoral	...	...	...	20·0
Length of ventral	...	...	...	19·0
Longest ray of anal	...	...	...	18·0
Length of caudal peduncle	...	...	...	27·2
Least height of caudal peduncle	...	...	...	6·8

¹ Annandale & Hora, *Rec. Ind. Mus.*, xviii, pp. 182-190, text-figs. 10, 12-15, pl. xv, fig. 4; pl. xvi, figs. 1 & 2 (1920); Hora, *Journ. As. Soc. Bengal* (n.s.), xxiv, pp. 481, 482, fig. 1 (1923).

² Hora, *Rec. Ind. Mus.*, xxiv, p. 77 (1922).



FISHES OF AFGHANISTAN.

- Fig. 1.—Ventral surface of head and anterior part of body of a young specimen of *Nemachilus* sp. prox. *griffithii* Günther. $\times 1 \frac{3}{5}$.
 Fig. 2.—Ventral surface of head and anterior part of body of the type-specimen of *Nemachilus farwelli*, sp. nov. Nat. size.
 Fig. 3.—Ventral surface of head and anterior part of body of *Oreinus sinuatus* var. *griffithii* McClell. $\times \frac{4}{5}$.
 Fig. 4.—Ventral surface of head and anterior part of body of *Schizothorax chrysochlora* (McClell.). $\times \frac{4}{5}$.
 Fig. 5.—Lateral view of *Barbus capito conocephalus* \times *Schizothorax* sp. $\times 1 \frac{1}{5}$.
 Fig. 6.—Ventral surface of head and anterior part of body of the above hybrid. $\times 1 \frac{1}{5}$.