

- dd. Brown, obscurely spotted with darker. Vomerine teeth do not extend nearly so far back as the palatine.....LATIFRONS.*
- cc. Unicolored.
- e. Brown; D. 84; C. 17; scales none; nostril midway between eye and mouth; head contained $2\frac{1}{3}$ (!) times in total length; 6 canines in upper jaw.....ORIENTALIS.
- ee. Dark brown; vomerine series longer than palatine, and extends farther back; D. 81; C. 20-21; scales few; nostril nearer eye than mouth; head contained $4\frac{1}{2}$ - $4\frac{3}{4}$ times in total length; 4 canines in upper jaw.....LEPTURUS.

A partial synonymy of the species is appended:

1. *Anarrhichas lupus* Linné.

Anarrhichas lupus LINNÉ, Syst. Nat., I, 1766, p. 430: DEKAY, Nat. Hist. N. Y., Fishes, 1842, p. 158, pl. xvi, fig. 43.

Anarrhichas vomerinus STORER, Hist. Fish. Mass., 1867, p. 99, pl. xviii, fig. 1.

2. *Anarrhichas minor* Olafsen.

Anarrhichas minor OLAFSEN, Reise i Island, 1772, § 683b, p. 592, tab. 42.

Anarrhichas pantherinus ZUIEW, Nov. Act. Petrop., 1781, p. 271, tab. b.

Anarrhichas leopardus AGASSIZ in SPIX, Pisc. Bras., 1829, p. 92, tab. li.

3. *Anarrhichas orientalis* Pallas.

Anarrhichas orientalis PALLAS, Zoog. Rosso-Asiat., 1831, p. 77, tab. xi.

4. *Anarrhichas latifrons* Steenstrup & Hallgrimsson.

Anarrhichas latifrons STP. & HALLGR., Förh. Skand. Naturf., 3die Möte, 1842, p. 647: COLLETT, Chra. Vid. Selsk. Forh., 1879, No. 1, p. 46, pl. ii.

Anarrhichas (Lycichthys) latifrons GILL, Baird's Ann. Rec. S. & I. for 1876 (1877), p. clxvii.

? *Anarrhichas denticulatus* KRÖYER, Overs. Vidensk. Selsk. Kjöbenhavn, 1844, p. 140: GAIMARD, Voy. en Scand., etc., Zool., Poiss., 1845, pl. 12.

5. *Anarrhichas fasciatus* Bleeker.

Anarrhichas fasciatus BLKR., Nederlandsch Tijdschrift voor de Dierkunde, Amsterdam, Deel iv, 1874, p. 151.

U. S. NATIONAL MUSEUM, October 25, 1879.

NOTES ON CERTAIN TYPICAL SPECIMENS OF AMERICAN FISHES
IN THE BRITISH MUSEUM AND IN THE MUSEUM D'HISTOIRE
NATURELLE AT PARIS.

By DAVID S. JORDAN, M. D.

In a recent visit to Europe the writer has had the privilege of examining the original types of certain species of American fishes, described

* *Anarrhichas latifrons* and *A. denticulatus* are made the type of a distinct subgenus by Professor Gill, who proposes to separate these from the *lupus* type by the following characters: The greater convexity and longitudinal arching of the skull at the posterior frontal region, and the much greater extension backwards of the palatine series of teeth as compared with the vomerine band. Examination of the large collection of the three Atlantic species of *Anarrhichas* in the National Museum has convinced me that these characters have not the taxonomic value claimed for them, owing to their great variability in individuals. The figures published by Steenstrup (Vid. Medd. naturh. For. Kjob., 1876, tab. iii) represent extremes of *A. minor* and *A. latifrons*, which, without access to many examples of both species, would be misleading. *A. minor*, for instance, sometimes has the vomerine band of teeth extending little farther back than is observed in *A. latifrons*. The dentition of *A. latifrons*, too, is subject to considerable variation with age, as is the shape of the skull. *A. minor* seems to show closer affinity to *A. latifrons* than to *A. lupus*.

by Dr. Albert Günther from specimens in the British Museum, and by Cuvier, Valenciennes, and others from examples in the Museum at Paris. Notes on some of these, the proper identification of which may affect our nomenclature, are here presented.

1. *Micropterus dolomieu* Lacépède.

Lacépède, Histoire Naturelle des Poissons iv, 324.

The original type of this species is a large specimen, still in good condition. Its peculiarity, which led to its separation from "*Labrus*" by Lacépède, is that the last rays of the dorsal are detached from the others, and somewhat distorted, the result of some accident to the fish while young. The injury to the specimen is therefore not a museum mutilation, as I had heretofore understood, but a healed wound. This specimen belongs to the southern variety of the small-mouthed Black Bass, recognized by me (Bull. U. S. Nat. Mus., xii, 1878, p. 30) as *Micropterus salmoides* var. *salmoides*. Prof. Vaillant recognizes this form provisionally (MSS. Mission Scientifique au Mexique) as a distinct species (*Micropterus dolomieu* Lac.) from the northern form, but the differences seem to me to have no more than varietal value.

As shown below, there is little doubt that the specific name *dolomieu*, is the first ever distinctly applied to our small-mouthed Black Bass, as the name *Micropterus* is its earliest generic appellation. Unless we adopt the earlier *salmoides*, its name should, therefore, be *Micropterus dolomieu*.

On the other hand it is true that the name *Micropterus dolomieu* was applied to a deformed specimen, which was considered as a distinct genus and species solely on account of its deformity.

It is an established rule of nomenclature (Dall, Rept. Comm. Zoöl. Nomenc., 48,) that "a name should be rejected * * * when it expresses an attribute or character positively false in the majority or the whole of the group in question, as in cases (among others) when a name has been founded on a monstrous, abnormal, immature, artificial, or mutilated specimen."

The name *Micropterus* was founded on a monstrous specimen; in the sense intended by its author it expresses a false character, although the species really have smaller fins than are found in related genera. In the opinion of some writers it should be set aside and the next name in order (*Calliurus* Raf.) should be adopted in its stead. The species might then stand as *Calliurus dolomieu*. The specific name "*dolomieu*" is also open to objection, as it is a French noun having neither a Latin nor a genitive form, but being an unmodified name of a person. This hardly seems to me a reason for rejecting the name, although, if retained, it should receive a genitive form, as *dolomii*, or *dolomiei*.

The question of the adoption of the name *Micropterus* is still an open one. The weight of authority is, however, at present in favor of its retention, and the writer sees no sufficient reason for setting it aside.

2. *Grystes salmoides* Cuvier & Valenciennes.*Labrus salmoides* Lacépède, Hist. Nat. des Poiss. III, 716.*Grystes salmoides* Cuv. & Val., Hist. Nat. des Poiss. III, 54, pl. 46.

It seems rather a thankless task to reopen the question of the proper nomenclature of the Black Bass, but it is evident that we have not yet reached the bottom. The name *Micropterus salmoides* is now generally adopted in America as the proper name of the small-mouthed Black Bass, not only among naturalists, but among anglers and sportsmen as well. In the Museum at Paris, however, the same name is fully adopted for the large-mouthed Black Bass. Let us inquire into the history of the use of the name *salmoides*.

In 1800, the name *Labrus salmoides* was given by Lacépède to a fish inhabiting the waters of Carolina, and known to Americans as "Trout." This fish was known to Lacépède only through a drawing and manuscript description by Bosc. Both species of Black Bass occur in Carolina, the large-mouth most abundantly. Neither drawing nor description is exact enough to enable us to tell with certainty, or even with reasonable probability, which species was meant by Bosc and Lacépède. It is unlikely that Bosc discriminated between them at all, both being alike "Trout" to the Carolina fishermen. In the figure the mouth is drawn large, and if we *must* choose, the large-mouth is best represented.

The specific name *salmoides* next appears in the great work of Cuvier & Valenciennes (III, p. 54) as *Grystes salmoides*. The description here given is for the most part applicable to both species; the small size of the scales ("il y en a quatre-vingt-dix sur une ligne longitudinale et trente-six ou quarante sur une verticale"*) and the naked preoperculum render it evident that at least that part of the description was taken from a small-mouth, while the accompanying figure more resembles the large-mouth.

We are, however, not here left in doubt. The original material of the French naturalists is still preserved in the museum. It consists of the following specimens as described by Cuvier and Valenciennes:

1. "Nous avons reçu, par M. Milbert, un individu de huit à neuf pouces et un de six à sept. C'est ce dernier qui a six rayons à la membrane des ouies et quatorze rayons mous à la dorsale."

From one of these specimens the figure in the *Histoire Naturelle des Poissons* (pl. 46) was taken.† This specimen is unquestionably a large-mouthed Black Bass.

2. "Plus tard, M. Lesueur nous en a envoyé de la rivière Wabash un individu long de seize pouces, et trois autres qui n'en ont guère que cinq. Les jeunes sont d'un vert plus pale, et ont sur chaque flanc vingt-cinq à trente lignes longitudinales et parallèles brunes, qui paraissent s'effacer avec l'âge."

These specimens are still preserved, bearing the MSS. name of *Cichla variabilis* Le Sueur, and belong to the small-mouthed species. This

*The very small precaudal scales are doubtless here included.

†Fide Vaillant.

name, which, so far as I know, was never published by Le Sueur, is thus noticed by Cuvier and Valenciennes:

"M. Lesueur, croyant l'espèce nouvelle, en a publié une description dans le Journal des sciences à Philadelphie, sous le nom de *cichla variabilis*; mais nous avons tout lieu de croire que c'est ce poisson qui est représenté et décrit par M. de Lacépède (t. iv, p. 716 et 717, et pl. 5, fig. 2), sous le nom de *labre salmoïde*, d'après des notes et une figure fournies par M. Bosc qui le nommait *perca trutte*. La figure en est un peu rude, mais la description s'accorde avec ce que nous avons vu, sauf quelques détails, qui tiennent peut-être moins au poisson même qu'à la manière dont il a été observé."

Later (vol. v, p. v), the type of *Micropterus dolomieu* was re-examined and fully identified by Cuvier as a *Grystes salmoides*.

It is thus evident that Cuvier and Valenciennes completely confounded the two species under the name *Grystes salmoides*, and that the uncertain *salmoides* of Lacépède became in their hands a complex species. We may perhaps say that their *salmoides* must be the fish described by them, and that the figure is to be taken into consideration only when other evidence is wanting. M. Vaillant, however, maintains that the large-mouthed species should be considered as the *salmoides* of Cuvier and Valenciennes, inasmuch as one of that species served as the type of their published figure.

The next writers who use the name *salmoides* (De Kay, Storer, etc.), have merely copied or echoed the description of Cuvier and Valenciennes, and have in no way given precision to the name.

Later Agassiz uses the name "*salmoneus*" (slip of the pen for "*salmoides*"?) apparently referring to the large-mouthed species.

The description given by Dr. Günther of *Grystes salmoides* in the Catalogue of the Fishes of the British Museum, I, 252, adds nothing to the precision of our knowledge of the species, the characters given being either taken from Cuvier and Valenciennes, or else common to both species.

Next a description is given of *Grystes salmoides* by Holbrook (Ich. S. Car., p. 28, pl. 4, f. 2), accompanied by an excellent figure, which leaves no possible doubt of the species intended. This is the large-mouthed Bass.

Omitting papers of lesser importance, we come finally to the very able discussion of these questions by Professor Gill (Proc. Am. Ass. Adv. Sci., 1873, p. 55-72), in which the whole subject is exhaustively treated, and the name *Micropterus salmoides* is definitely adopted for the small-mouthed Black Bass. This arrangement has been followed by most recent ichthyologists. In an important paper just now passing through the press (Mission Scientifique au Mexique), however, Messrs. Vaillant and Bocourt have adopted the name *Micropterus salmoides* for the large-mouthed species, for the reasons indicated above.

This question resolves itself into two. Is the specific name *salmoides* available for either species? and if so, for which?

Between the publication of the works of Lacépède and Cuvier both

species had been more than once described under different names by Rafinesque and Le Sueur. Of these names, *Lepomis pallidus* Raf. for the large-mouthed Black Bass, *Micropterus dolomieu* Lac. for the southern, and *Bodianus achigan* Raf. for the northern variety of the small-mouth have priority over the others. All these, therefore, antedate any precise definition of the name *salmoides*.

The question as to whether a specific name, at first loosely applied and afterwards precisely fixed, shall claim priority from its first use or not, has been differently answered by different writers, and has perhaps never been settled by general usage. I suppose that the amount of doubt or confusion arising from its use or rejection enters with most writers as an element. The name *salmoides*, left unsettled by Lacépède, has been generally received by writers, in consequence of the supposed precision given to it by Cuvier. We have seen, however, that both species were included by Cuvier under one name, and that we must look farther for real restriction of the species. The first distinct use of the name *salmoides* for any particular species is by Holbrook, for the large-mouthed form. On the basis of the first unquestionable restriction, the name, if used at all, must be applied to that species. Forty years previous to this restriction, however, the specific name *pallidus* was conferred on the same fish by Rafinesque.

In the writings of nearly all the older naturalists, as well as in many of the later ones, we find descriptions of species which are really generic in their value, and which, as our knowledge of species becomes greater, cannot be disposed of with certainty or even with any high degree of probability, for absolute certainty rarely accompanies any identification.

In the absence or impossibility of any general rule regarding such cases, the following supposed examples will illustrate what seems to the present writer a fair method of treating them.

Let us suppose that the genus *Micropterus* contains two well-marked species; that to one of these the name *salmoides* was early applied; that next the names *dolomiei* and *pallidus* were applied to the two respectively, and that subsequently the name *salmoides* was restricted to the one called *pallidus*.

Now if (1) the original *salmoides* were definitely a complex species, distinctly including both, we may hold its author to be a "conservative" writer, and that the subsequent restriction, like the restriction of a genus, is a change of view or the elimination of an error. In this case, the name *salmoides* should be retained, dating its priority from its original use, and applying to the species *pallidus*.

If (2) the original *salmoides* be not complex, but simply uncertain, the probabilities being undeniably in favor of its identity with *pallidus* rather than with *dolomiei*, it should be adopted instead of *pallidus*. Absolute certainty of identification cannot be expected of many names older than the present generation, and each writer must judge for himself of

the degrees of probability. If we may express it numerically, a probability of 75 per cent. should perhaps be sufficient, and this probability should be unquestionable—that is, not merely subjective and varying with the mental differences of the different writers.

If (3) the original *salmoides* be evidently a *Micropterus*, but hopelessly uncertain as to the species intended, it should claim priority from its first use for a definite species of *Micropterus*. If the name *pallidus* intervene between its first use and its final precise use, *salmoides* should become a synonym of *pallidus*, and should not be available for the other species. This rule is followed more or less consistently by most writers, and it seems to me a fair one. The revival of hopelessly uncertain ancient specific names in place of well-defined modern ones is productive only of confusion, and is open to gross abuse. The revival even of well-defined but forgotten names is confusing enough, and it has been strongly objected to by many writers.

If (4) the name *salmoides*, left hopelessly uncertain by its author, should have been definitely used for some species to which it might not improbably have referred *before* the use of the name *pallidus* for the same species, it should be retained, dating its acceptance from its second use, and the name *pallidus* should be considered as a synonym of *salmoides*.

If (5) the name *salmoides* should have been adopted by the second author supposed in (4) for some species not a *Micropterus*, or for some species which could not reasonably be identical with the original *salmoides*, the identification should be taken as an erroneous one, and should not be considered in our nomenclature.

The actual state of the name *salmoides* is that supposed under (3) above. I do not consider the name *salmoides* as rightfully entitled to priority over either *pallidus* or *dolomiei* as the specific name of a species of Black Bass. If it must be used, however, I think it wisest to retain it, with Professor Gill, for the small-mouthed species. For this purpose, we must consider the *salmoides* of Lacépède as complex, including both species. The case would then be that supposed by (1) above. We must hold further that Cuvier and Valenciennes restricted the name to the *small-mouthed* form. No possible settlement of the case can be free from question or objection. I propose to adopt the following view of the case, proposed by Dr. Gill (in *lit.*), to whom I have submitted the evidence above given.

Dr. Gill remarks:

“I think we can retain our old names (i. e. *Micropterus salmoides* and *Micropterus pallidus*) on the following grounds:

“(1) Let us admit that *Labrus salmoides* Lac. may be the small-mouthed.

“(2) The name *salmoides*, it may be considered, was re-established by Cuvier and Valenciennes for the largest specimen (the small-mouthed, according to your observations). The description was evidently based

on that, as appears from the number of scales, the absence of any on the preopercular limb ("le limbe de son préopercule [etc.] en manquent"), and the form of the dorsal. Even if it is certain that the figure was taken from a large-mouthed specimen, this would not affect the question, inasmuch as we must accept the description when that is definitive, and such is the case here.

"(3) It may be held that the name is further specialized by Cuvier and Valenciennes by its use to supersede the name of Le Sueur (p. 55), and as a substitute for M. Dolomieu (vol. v, p. 5).

"(4) The majority of the C. & V.'s specimens belonged to the small-mouthed Bass.

"(5) The figure was based on a large-mouth simply through accident of size and condition, not selected on account of exhibition of characters. In the same way, we might maintain that the type of *Pomotis vulgaris* C. & V. (although the description plainly points to *Eupomotis aureus*) was *Lepomis pallidus* [rather *auritus*], for the figure apparently represents such."

3. *Micropterus variabilis* Vaillant & Bocourt.

Cichla variabilis Le Sueur, MSS.

Micropterus variabilis Vaillant & Bocourt, MSS., Mission Scientifique au Mexique.

This is the ordinary northern small-mouthed Black Bass, *Micropterus achigan*, or var. *achigan* of authors, *Micropterus salmoides achigan* of the present writer.

4. *Bryttus unicolor* Cuvier & Valenciennes.

Hist. Nat. des Poiss. vii, 464.

A specimen collected by Le Sueur at Philadelphia, and doubtless the original type, seems to be the young of *Lepomis auritus*. Some of the specimens labelled *Pomotis vulgaris* are likewise *Lepomis auritus*. From one of these the figure of the species was apparently taken.

5. *Bryttus punctatus* Cuvier & Valenciennes.

Hist. Nat. des Poiss. vii, 462.

The types of this species (Charleston, Holbrook Coll.) belong to the species recently described by Prof. Cope as *Lepomis apiatus* (Proc. Am. Philos. Soc., 1877) and by me as *Lepiopotomus apiatus* (Bull. U.S. Nat. Mus. x, 1877, 25). This species should therefore stand as *Lepomis punctatus*.

6. *Bryttus reticulatus* Cuvier & Valenciennes.

Hist. Nat. des Poiss. vii, 463.

This species is unquestionably identical with the preceding.

7. *Pomotis holbrookii* Cuvier & Valenciennes.

Hist. Nat. des Poiss. vii, 466.

This species is the *Pomotis speciosus* of Holbrook, *Pomotis microlophus* Günther. It should therefore stand as *Eupomotis holbrookii*. *Xystroplites longimanus* Cope, is at least very similar, as also *Pomotis pallidus* Ag.

8. *Pomotis catesbyi* Cuvier & Valenciennes.

Hist. Nat. des Poiss. vii, 469.

As commonly supposed, this species is *Eupomotis aureus* (*Pomotis vulgaris* C. & V.).

9. *Pomotis ravenelii* Cuvier & Valenciennes.

Hist. Nat. des Poiss. vii, 469.

This species is an *Eupomotis*, probably *aureus*, as supposed by me (Bull. U. S. Nat. Mus. x, 38), but the types are too far decayed for certain identification.

10. *Pomotis gibbosus* Cuvier & Valenciennes.

Hist. Nat. des Poiss. vii, 467.

The types of this species, as well as those of *Pomotis incisor* C. & V. (l. c. p. 446), belong to the species called by me *Lepomis pallidus*.

11. *Pomotis solis* Cuvier & Valenciennes.

Hist. Nat. des Poiss. vii, 468.

Only the Philadelphia specimens seen. These are badly decayed, but probably belong to *Eupomotis aureus*.

12. *Plesioperca anceps* Vaillant.

(Nouvelles Archives du Muséum d'Hist. Naturelle, tome 9, p. 37, 1873.)

As already supposed by the present writer, this species is the *Hadrop-terus nigrofasciatus* Agassiz.

13. *Esox deprandus* Le Sueur.

(Le Sueur MSS., Cuv. & Val. Hist. Nat. des Poiss. xviii, 336.)

The type of this species, a large stuffed skin, is an ordinary *Esox lucius* L. The cheeks, as usual, are scaly; the opercles naked below.

14. *Leuciscus gardoneus* Cuv. & Val.

(Hist. Nat. des Poiss. xvii, 316; Günther Cat. Fishes Brit. Mus. vii, 258.

Chondrostoma gardoneum Cope, Trans. Am. Phil. Soc. 1866, 393.)

The single typical specimen of this species agrees with *Notemigonus chrysoleucus* in most respects, differing chiefly in the short anal (9 or 10 developed rays). It must be referred to the genus *Notemigonus*, of which it possesses the carinated abdomen, backward dorsal, and the teeth 5-5, the edges of the grinding surface strongly crenate. If the specimen is normal, not an accident or hybrid, the species should stand as *Notemigonus gardoneus*. Professor Cope's statement, that the type of this species (also examined by him in Paris) is "identical with *Chondrostoma* in dentition and other characters," is not reconcilable with my ideas of the genus *Chondrostoma*.

15. *Leuciscus spiralingulus* Cuv. & Val.

Hist. Nat. des Poiss. xvii, p. 321, pl. 506.

The types are small specimens of *Luxilus cornutus* (Mitch.).

16. *Gobio cataractæ* Cuv. & Val.

Hist. Nat. des Poiss. xvi, 315, pl. 483.

The type of this species, as already supposed by me (Man. Vert. E. U. S., ed. 2d, p. 307), is the *Rhinichthys nasutus* of authors, which should

therefore stand as *Rhinichthys cataractæ*. The teeth of the typical specimen have never been examined. The difference in the dentition of *Gobio* and *Rhinichthys* does not therefore affect the correctness of this identification.

17. *Leuciscus boucardi* Günther.

Cat. Fishes Brit. Mus. vii, 485.

The teeth of this species have a very narrow grinding surface. It is therefore probably referable to the genus *Myloleucus* as understood by me.

18. *Ceraticthys sallæi* Günther.

Cat. Fishes Brit. Mus. vii, 484.

As this species has no barbels, the propriety of its reference to *Ceraticthys* is not evident. It has the teeth 4-4 with grinding surface, and is therefore referable to the genus *Hudsonius* (*Hybopsis* Cope) as now understood by me.

19. *Ceraticthys cumingi* Günther.

Cat. Fishes Brit. Mus. vii, 177

This species is a true *Ceraticthys*, evidently closely related to *C. amblops*. It perhaps was not taken in California.

20. *Graodus nigrotæniatus* Günther.

Cat. Fishes Brit. Mus. vii, 485.

There are three typical examples of this species. The teeth of two of them were examined by Dr. Günther, and have, as stated by their describer, "pharyngeal teeth quite rudimental replaced by a somewhat uneven ridge of the bone." The third specimen, however, proved on examination to have developed teeth, of the ordinary sort, *two* on each *side*. Traces of the roots of similar teeth were visible on the other specimens, but in none were any evidences of the existence of a greater number. It is, therefore, possible that the normal number is 2-2. It is my opinion, however, that the teeth are normally 4-4, and that in these examples they have been lost, either by natural shedding or through the softening due to long preservation in spirits. If this view is correct, the genus *Graodus* should be suppressed. As the teeth are without grinding surface, the species should be referred to the genus *Cliola*, as understood by me, and should stand as *Cliola nigrotæniata*. If the teeth are normally 2-2, the genus *Graodus* should be retained.

The writer wishes to express his obligations to Dr. Günther for the permission to examine these and other specimens in the British Museum, and to Professors Vaillant and Sauvage for similar favors at the Museum at Paris.

OCTOBER 20, 1879.



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