9.—A REVIEW OF THE GENERA AND SPECIES OF SERRANIDÆ FOUND IN THE WATERS OF AMERICA AND EUROPE.

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The family of *Serranidæ* includes many of our most important food fishes. The group comprises the various species popularly recognized as salt-water perch and bass, the groupers, garrupas, hinds, cabrillas, jew-fishes, together with the striped bass of different species which inhabit or ascend our rivers. Nearly a hundred species are found in North American waters, and of these every one, according to its size, is valuable as food. Some of them, popularly known as "jew-fishes," are among the very largest of spiny-rayed fishes, and many of the smaller forms are remarkable for the brilliancy of their coloration.

This present paper contains an enumeration of the genera and species belonging to the family of *Serranidæ* found in the waters of America and Europe, together with the synonymy of each, and analytical keys by which the different groups may be distinguished.

An earlier paper by Professors Jordan and Swain (Proc. U. S. Nat. Mus., 1884, p. 358–411) has served as the basis of our studies of the *Epinephelinæ*, but this paper has been supplemented by the study of a very much larger amount of material, and the whole group of *Serranidæ* has been brought under consideration.

We have examined all the specimens of *Serranidæ* now contained in the Museum of Comparative Zoology at Cambridge, Massachusetts,* and all that are in the museum of the Indiana University. A large part of the material in the U. S. National Museum we have also studied, and also most of the original types contained in the museum at Paris and in the British Museum.

We have been indebted to Prof. Alexander Agassiz and to Mr. Samuel Garman for the free use of the specimens in the Museum of Comparative Zoology. We are also indebted to Miss Elizabeth G. Hughes for help in the compilation of synonymy and in the preparation of skulls.

For all statements regarding South American specimens the senior author is alone responsible.

From the family *Serranidæ*, as understood by us, we exclude *Centropomus*, which, although certainly allied to the *Latinæ*, should, according to Dr. Gill, stand as a separate family. The *Lobotidæ* (*Lobotes*) stand nearer, but having no teeth on vomer or palatines, they may be kept in a separate group. The *Priacanthidæ* (*Priacanthus* and

*Excepting the sub-family *Latinæ*.

Pseudopriacanthus) should certainly be omitted from the *Serranidæ*, as should *Apogon* and its allies, among which are apparently the two aberrant Cuban genera, *Liopropoma* and *Chorististium*. We are not quite sure that *Rypticus*, *Percichthys* or even *Morone* should be retained among the *Serranidæ*, but we prefer for the present to regard the three groups typified by these genera as sub-families of *Serranidæ*, rather than to attempt to define them as distinct families.

The *Percidæ* (*Perca*, *Stizostedion*, *Aspro*, *Etheostoma*) stand near *Morone* and *Percichthys*, but they are fairly well defined by the greatly increased number of vertebræ, a character associated with their fresh-water life and northern distribution. From all *Serranidæ* they further differ in having two anal spines. Near also to the *Serranidæ* is the singular group of North American sun-fishes or *Centrarchidæ*. In these, however, the pseudo-branchiæ are obsolete and the general form of the body is notably different.

The American genera of *Serranidæ* fall naturally into six groups, which we may call sub-families, although the relation of two of these groups (*Serraninæ* and *Epinephelinæ*) is almost too close for such designation. These six groups, *Grammistinæ*, *Epinephelinæ*, *Serraninæ*, *Anthiinæ*, *Latinæ*, and *Percichthyinæ*, are typified respectively by the genera *Rypticus*, *Epinephelus*, *Serranus*, *Anthias*, *Morone*, and *Percichthys*. They are easily recognized, and in most cases readily defined, notwithstanding the fact that most European naturalists have confounded *Epinephelus* with *Serranus*, while some have placed in the genus *Anthias* not only genuine *Serraninæ*, but also species of the *Sparoid* group of *Lutjaninæ*.

The American *Grammistinæ* all belong to a single genus *Rypticus*, *Grammistes* having no American representatives.

The recognized genera of *Epinephelinæ* are fairly well defined, and although most of them are closely allied to each other, there is no evidence of any intergradation of such a character as to efface our lines of generic division.

The *Serraninæ* are equally varied among themselves, but the lines of division are less sharply marked, and certain species form connecting links between one genus and another. Authors have divided the group or sub-family into numerous genera, but these genera are not separated by strongly marked characters, and most of them might well be placed as sub-genera under *Serranus*.

The species of *Anthiinæ* are not numerous, but the generic differences in this group are more marked than those separating the genera of the two groups just named. The representation of this group in our fauna is not extensive enough to give us a clear idea of the mutual relations of the forms included in it.

We unite under the sub family name of *Latinæ* (the more usual name *Labracinæ* not being available, as the name *Labrax* properly belongs to the genus *Hexagrammus*, of which name it is a later synonym) certain *Serranidæ*, which show more marked resemblances to the genus *Perca*. These are characterized in general by the divided dorsal, the villiform teeth, and by the absence of a supplementary bone to the maxillary. A majority of the species are Asiatic, and but few of these have been studied by us. Some of them (*Cnidon*) are said to lack the pseudo-branchiæ, but this is probably not true. Some of the *Latinæ* (*Lateolabrax*) approach the *Percidæ* in the increased number (35) of the vertebræ, which are about 25 in most of the others, but they differ from the *Percidæ* in this, at least, that none of the latter (*Perca*, *Stizostedion*, *Etheostoma*, *Acerina*, *Aspro*, etc.), have more than two spines in the anal fin, while all the *Latinæ*

have three. Most of the species of *Latinæ* found in Europe and North America are closely related, and might well be referred to a single genus—*Morone*. *Lates* and *Kuhlia* are, however, quite unlike *Morone*, and perhaps should be placed in different groups.

The sixth sub-family, *Percichthyinæ*, is still closer to the *Percidæ*, agreeing with the perch in the general form of the head and body, in the increased number (36) of the vertebræ, and in the armature of the head. The species have, however, *three* anal spines, there is a large supplemental maxillary, the scales are scarcely ctenoid, and the spinous dorsal is short. If a division is to be made between *Percidæ* and *Serranidæ*, certainly *Percichthys* should be placed in the latter family.

Of the 119 species here admitted, the following (32 in number) have not been studied by us:

Rypticus nigromaculatus.
Rypticus arenatus.
Rypticus bicolor.
Polyprion oxygeneios.
Hemilutjanus paytensis.
Alphestes pictus.
Epinephelus aspersus.
Epinephelus caninus.
Epinephelus goreensis.
Epinephelus æneus.
Epinephelus alexandrianus.
Epinephelus chrysotænia.
Dermatolepis angustifrons.
Bodianus panamensis.
Bodianus tæniops.
Hypoplectrus gemma.
Hypoplectrus crocotus.
Diplectrum conceptione.
Serranus annularis.
Serranus flavescens.
Serranus peruanus.
Serranus castelnaui.
Odontanthias asperilinguis.
Odontanthias tonsor.
Bathyanthias roseus.
Dicentrarchus orientalis.
Dicentrarchus punctatus.
Lates nilotica.
Percichthys lævis.
Percichthys melanops.
Percilia gillissi.
Percilia gracilis.

ANALYSIS OF SUBFAMILIES OF SERRANIDÆ.

COMMON CHARACTERS.—Body oblong, more or less compressed, covered with adherent scales of moderate or small size, which are usually but not always ctenoid. Mouth moderate or large, not very oblique, the premaxillary protractile and the broad maxillary not slipping for its whole length into the sheath formed by the preorbital, which is usually narrow. Teeth all conical or pointed, in bands, present on jaws, vomer and palatines.* Gill-rakers long or short, usually stiff, armed with teeth. Gills 4, a long slit behind the fourth. Pseudo-branchiæ present, usually large. Lower pharyngeals rather narrow, separate, with pointed teeth. Gill-membranes separate, free from the isthmus. Branchiostegals normally 7 (occasionally 6). Cheeks and opercles always scaly; preopercle with its margin more or less serrate, the opercles usually ending in one or two flat spine-like points. Nostrils double. Lateral line single, not extending on the caudal fin. Skull without cranial spines and usually without well-developed cavernous structure. No suborbital stay. Dorsal spines usually stiff, 2 to 15 in number; soft dorsal with 10 to 20 rays. Anal fin rather short, its soft rays 7 to 12, its spines three (obsolete in one subfamily). Ventrals thoracic, I, 5, normally developed. Pectorals well developed. Caudal peduncle stout, the fin variously formed. Vertebræ usually about 10 + 15 (more in some of the *Latinæ* and *Percichthyinæ;* 16 + 19 in *Lateolabrax;* 16 + 20 in *Percichthys*). Air bladder present, usually small, and adherent to the walls of the abdomen. Stomach cæcal, with few or many pyloric appendages; intestines short, as usual in carnivorous fishes.

* Except in *Percilia*, which has blunt teeth, and none on the palatines.

a. Anal spines obsolete; dorsal spines 2 to 8; scales very small, smooth; teeth all villiform; maxillary with a supplemental bone; head scaly; lateral line normal; gill-rakers rather few and short; caudal rounded; preopercle without angle or serrations, but with two or three spinous teeth above ..... GRAMMISTINÆ, I.

aa. Anal spines 3; dorsal spines 8 to 14.

b. Dorsal fin continuous or nearly so, not divided nearly to the base.

c. Maxillary with a supplemental bone (usually distinct, but sometimes hidden in the skin); canine teeth usually present, at least in front of jaws; inner teeth in both jaws usually depressible; scales small, firm, the top of head more or less scaly; lateral line running low (except in *Gonioplectrus*, etc.); supraoccipital crest usually more or less encroaching on the top of the skull, so as to leave no distinct smooth area at the vertex (except in *Variola*); temporal crests usually distinct; gill-rakers various, generally small and short. Dorsal rays VIII to XIV–12 to 20, the number of spines usually not ten; anal rays III, 7 to III, 12; vertebræ about 10 + 14 = 24. Chiefly shore-fishes, often of large size; all of them, so far as known, bisexual ..... EPINEPHELINÆ, II.

cc. Maxillary without supplemental bone; canine teeth, if present, usually developed on the side of the lower jaw as well as in front; no depressible teeth; scales mostly ctenoid, including those of the lateral line; temporal crests on cranium almost obsolete.

d. Gill-rakers comparatively short and wide apart; lateral line not running close to the back (except in one species); dorsal rays X, 11 to 15; anal rays usually III, 7; supraoccipital crest not extending far forward on top of skull, a more or less distinct convex smooth area being left on the vertex between the supraoccipital and the interorbital area; mouth less oblique than in the *Anthiinæ;* vertebræ about 10 + 14 = 24. Chiefly shore-fishes of olivaceous colors; some of them—possibly all—hermaphrodite ..... SERRANINÆ, III.

dd. Gill-rakers (in all species known to us) very long, slender and close-set; lateral line running close to the back; dorsal rays IX to XII, 9 to 20. Anal rays III, 7 to 10; supraoccipital crest very high, not encroaching on the short, convex, smooth area at the vertex, which is considerably depressed; canines usually strong; preorbital very narrow. Deep-water fishes, usually bright red in life. ..... ANTHIINÆ, IV.

bb. Dorsal fins separate, or joined at base only, the rays VII to XI–I, 12 to 14.

e. Maxillary without supplemental bone;* teeth all alike, usually villiform, without canines; preorbital narrow; lateral line normal, straight, or bent upward at base; preopercle serrate; gill-rakers moderately long and slender; verterbræ 10+14=24 to 16+19=35, the number usually more than 24. Species of generally large size, and silvery-olive coloration, mostly inhabiting fresh or brackish waters ..... LATINÆ, V.

ee. Maxillary with a large supplemental bone; membrane bones of head extensively cavernous; vertebræ in increased number, 16+20=36 in *Percichthys;* lateral line normal; dorsal rays about X-11; gill-rakers rather short and thick. Species of moderate size and dull olive coloration, inhabiting the fresh waters of Chili ..... PERCICHTHYINÆ, VI.

ANALYSIS OF AMERICAN AND EUROPEAN GENERA OF SERRANIDÆ.

Subfamily I.—GRAMMISTINÆ.

(*Serranidæ* with the anal spines obsolete, the dorsal spines in small number, maxillary with a supplemental bone; the preopercle with two or three spine-like hooks posteriorly, the scales small and imbedded, the teeth all villiform.)

a. Dorsal spines two to four; preorbital narrow; no canine teeth; preopercle without angle or serratures, its margin with 2 or 3 spinous teeth above; caudal fin rounded; scales small, smooth, embedded; smooth area on top of head very large, transversely convex, much longer than the low supraoccipital crest; interorbital area very narrow; temporal ridges strong... RYPTICUS, 1.

*In *Morone, Lateolabrax*, etc. We have not examined *Lates.*

Subfamily II.—EPINEPHELINÆ.

(*Serranidæ* with the dorsal fin continuous, the dorsal and anal spines developed, and with a supplemental bone to the maxillary.)

a. Soft dorsal with 10 to 12 rays; teeth all villiform, without canines.

b. Head armed with rough spinigerous crests, there being spinous projections above the eyes and a rough, bony ridge on the opercle, with others on the post-temporal; dorsal fin low, continuous; tongue with teeth; dorsal spines 11 or 12; soft dorsal scaly; caudal rounded; pyloric cœca numerous (about 70).....POLYPRION, 2.

bb. Head not armed with spinigerous ridges; preopercle moderately serrate, sometimes becoming entire with age.

c. Dorsal fin deeply notched, the last spines much shorter than the middle ones; scales rugose; soft dorsal scaly; dorsal spines 11; tongue toothless; forehead broad, flattish; snout, preorbital, and jaws naked; caudal subtruncate; preopercle finely serrate, becoming entire with age; gill-rakers very strong; pyloric cœca few (about 7).....STEREOLEPIS, 3.

cc. Dorsal fin low, its outline not deeply notched; scales small, ctenoid; soft dorsal naked; dorsal spines 10; forehead broad, concave near the orbital ridges, then transversely convex; preopercle subrectangular, with fine serræ above, larger, radiating teeth on angle, and many small teeth directed downward on lower limb; snout, preorbital and jaws densely scaly; eyes very large; preorbital very narrow; caudal lunate, with rounded angles; gill-rakers long and slender; lateral line black .....HEMILUTJANUS, 4.

aa. Soft dorsal, with 13 to 20 rays; head unarmed, except for the opercular spines and the serræ on the preopercle; soft dorsal scaly; scales of lateral line usually triangular and cycloid.

d. Preopercle with one or more large, conspicuous, hook-like teeth, directed downward and forward, on its lower limb.

e. Dorsal spines, 8; plectroid spine on preopercle single, very strong; a strong canine on middle of side of lower jaw; opercle with a long, knife-shaped spine; body rather deep; lateral line running high; jaws naked; scales small, firm, and rough; caudal rounded; soft dorsal rather short, of 12 to 13 rays..GONIOPLECTRUS, 5.

ee. Dorsal spines, 10; plectroid spines on preopercle two to four, rather small; a stout canine on middle of side of lower jaw; opercle with small spines; jaws naked; scales rather large; soft dorsal long, with 17 to 20 rays; caudal rounded..GILBERTIA, 6.

eee. Dorsal spines, 13 (12 to 14); plectroid spines two or three in number; usually one or more strong canines present on side of lower jaw; body short and deep .....ACANTHISTIUS, 7.

eeee. Dorsal spines, 11; plectroid spine on preopercle single; no lateral canine in lower jaw; (otherwise as in *Epinephelus*).....ALPHESTES, 8.

dd. Preopercle without distinct antrorse spinous hooks on its lower limb; sides of lower jaw without distinct canines.

f. Dorsal spines, 11 (10 in one species of *Epinephelus*).

g. Scales, some or all of them, more or less ctenoid; canines distinct, in front of one or both jaws; body oblong or elongate, not greatly compressed, the interorbital width more than twice diameter of the eye, in the adult; preopercle finely serrate.

h. Anal fin short, its rays III, 8, or III, 9; cranium with the median crest much more developed than lateral crests, which do not extend as far forward as the former and are not parallel with them; scales nearly all ctenoid; spines strong.

i. Scales of the lateral line normal, not marked by radiating ridges...EPINEPHELUS, 9.

ii. Scales of the lateral line each with 4 to 6 strong radiating ridges; cranium short, extremely broad, and depressed between the eyes; the anterior profile of head a little concave; dorsal spines low; dorsal rays XI, 16.....PROMICROPS, 10.

hh. Anal fin elongate, its rays III, 11 or III, 12; caudal fin lunate or truncate; spines slender, those of the anal fin graduated; lower jaws strongly projecting; cranium rather broad and transversely concave between the eyes, its lateral crests very strong, nearly parallel with the supraoccipital crest and extending farther forward than the latter, joining the supraocular crest above the eye; scales small, largely cycloid, those of the lateral line simple; pyloric cæca few (12 to 20); dorsal rays XI, 16 to 18.....MYCTEROPERCA, 11.

gg. Scales all smooth (said to be ciliated in *D. angustifrons*); canine teeth small or obsolete; head small, much compressed, the interorbital area in the adult not broader than the eye; supraoccipital crest low; soft dorsal unusually long, the rays XI, 17 to 20; dorsal spines low; vertical fins all rounded posteriorly.....DERMATOLEPIS, 12.

ff. Dorsal spines, 9.

j. Soft dorsal of moderate length and height; dorsal rays IX, 13 to 15; anal rays III, 7 or 8; caudal fin rounded or lunate; skull and head essentially as in *Epinephelus*, the snout not very short, the frontal region flat or convex, the supraoccipital crest continued forward over it, the lateral crests short, low and diverging; mouth and teeth as in *Epinephelus*.....BODIANUS, 13.

jj. Soft dorsal long and very low; dorsal rays IX, 18 or 19; caudal fin deeply forked, the lobes attenuate; snout very short, convex in profile; frontal region flattish or transversely concave, the median crest very prominent; mouth small, the teeth slender.....PARANTHIAS, 14.

Subfamily III.—SERRANINÆ.

(*Serranidæ* without supplemental bone to the maxillary, with no depressible teeth and with more or less distinct lateral canines in the lower jaw; the gill-rakers comparatively short and few in number; the dorsal fin continuous, its number of spines normally 10, and the lateral line usually normal in direction.)

a. Body short and deep, with elevated back, the depth more than two-fifths the length, usually nearly half; preopercle with a few antrorse serræ on its lower limb; top of supraoccipital crest very high, about as long as the smooth area on vertex of cranium; top of head naked; dorsal rays usually X, 14.....HYPOPLECTRUS, 15.

aa. Body comparatively elongate, the depth one-third to one-fourth the length; no hooked spinules on lower limb of preopercle.

b. Smooth area on top of cranium, very short and small; the long supraoccipital crest encroaching on the posterior border of cranium so that the latter in profile is not nearly vertical along the occipital region.

c. Caudal fin more or less distinctly lunate or concave, the middle rays shortest; dorsal spines strong, very unequal, the third or fourth more or less elevated; (scales small; dorsal rays X, 14; top of head usually more or less scaly.)....PARALABRAX, 16.

cc. Caudal fin not lunate, ending in three points, the middle rays produced like the outer ones; dorsal spines slender, the third little elevated, some of them with dermal appendages or filaments; (teeth small, in broad bands; top of head naked; scales large; dorsal rays X, 11.).....CENTROPRISTIS, 17.

bb. Smooth area on top of cranium very large, longer than the low supraoccipital crest, which is low and short; posterior border of cranium at occipital region nearly vertical in profile.

d. Dorsal spines very unequal, one or more much produced; dorsal rays, X, 12, or X, 13; preopercle evenly serrate; preorbital comparatively broad.

e. Dorsal spines most of them produced in long filaments; branchiostegals 7; top of head, cheeks and preorbital finely and closely scaled; snout long and low, the lower jaw much projecting; caudal lunate; scales rather small.....CRATINUS, 18.

ee. Dorsal with the third spine only produced in a long filament; branchiostegals 6, the first being obsolete; top of head naked; scales large; caudal subtruncate..DULES, 19.

dd. Dorsal spines subequal; none of them much produced.

f. Top of head closely scaled; scales large; soft dorsal scaly, its rays about X, 12. PARACENTROPRISTIS, 20.

ff. Top of head from the occiput forward naked.

g. Preopercle with numerous strong diverging spines at its angle, these spines diverging from one or two centers; (profile of head arched; preorbital broader than maxillary, which is widest near its middle; scales rather large).. DIPLECTRUM, 21.

gg. Preopercle simply and rather finely serrate; scales large or small; preorbital narrow; canine teeth various; dorsal rays X, 11, to X, 15..... SERRANUS, 22.

Subfamily IV.—ANTHIINÆ.

(*Serranidæ* with the maxillary destitute of supplemental bone and with the lateral line running very high, close to the dorsal fin; the gill-rakers numerous, long and slender; the mouth oblique, with broad, short maxillary.)

a. Lateral line complete, extending from gill-opening to base of caudal.

b. Caudal-fin very deeply forked, the lobes produced; dorsal spines, 10; preopercle angular, with salient teeth at its angle; one or more of the dorsal spines filamentous; ventral fins produced.

c. Maxillary and frontal region naked; tongue toothless..... .....PRONOTOGRAMMUS, 23.

cc. Maxillary scaly; top of head scaled to the snout; third dorsal spine produced; body compressed.

d. Tongue without teeth.....ANTHIAS, 24.

dd. Tongue with a large patch of villiform teeth.....ODONTANTHIAS, 25.

bb. Caudal fin subtruncate; dorsal spines, 9; preopercle evenly rounded, its edge very finely serrate; none of the dorsal spines produced, the fins all low; no canines; no opercular spine; jaws scaleless.....BATHYANTHIAS, 26.

aa. Lateral line ceasing under last rays of soft dorsal; preopercle entire; dorsal spines 11; jaws scaly; canines present; dorsal spines and ventral fins not produced; caudal deeply forked, its lobes elongate .....CALLANTHIAS, 27.

Subfamily V.—LATINÆ.

(*Serranidæ* with the dorsal fins more or less distinctly separated; the lateral line straight or slightly curved upwards in front; no supplementary maxillary bone, and the teeth all alike, without canines; vertebræ 24 to 35; membrane bones of head not especially cavernous. Fishes often entering or inhabiting rivers.)

a. Caudal fin rounded behind; pseudobranchiæ small; tongue toothless; form elliptical, with pointed snout and projecting lower jaw; preorbital, post-temporal, and clavicular bones serrate; angle of preopercle with a strong spine directed backward, the spinules on the lower limb directed somewhat forward; dorsal spines strong, eight in number, the third elevated; anal spines small.....LATES, 28.

aa. Caudal fin lunate or forked; pseudobranchiæ large; angle of preopercle with no large horizontal spine; dorsal spines ten.

d. Top of head naked; lateral line distinctly arched in front; body much compressed; preorbital sharply serrate; dorsal fins joined, the spines moderate; anal spines graduated; mouth oblique, the lower jaw projecting; gill-rakers slender; teeth on tongue minute or wanting.....KUHLIA, 29.

dd. Top of head scaly; lateral line nearly straight; teeth on tongue in one or more patches.

e. Preopercle without antrorse spines on its lower limb.

f. Dorsal fins joined; spines of fins strong; anal rays III, 9, the spines not graduated; jaws subequal; base of tongue toothless ..... MORONE, 30.

ff. Dorsal fins separate; spines of fins weak; anal rays III, 12, the spines graduated; lower jaw projecting; base of tongue with teeth ..... ROCCUS, 31.

ee. Preopercle with about 3 antrorse spines on its lower limb; dorsals separate; spines slender; anal rays III, 11, the spines graduated; lower jaw slightly projecting. ..... DICENTRARCHUS, 32.

Subfamily VI.—PERCICHTHYINÆ.

(*Serranidæ* approaching the *Percidæ*, having the general form of the true Perch (*Perca*); the dorsal fins separated; the maxillary with a large supplemental bone, and the teeth subequal without canines; vertebræ in increased number (about 36); lower jaw, preorbital, suborbital and preopercle extensively cavernous; fresh water fishes of Chili.)

a. Palatine teeth present; preorbital retrorse-serrate; snout bluntish in profile; top of head scaly as far forward as anterior nostril; teeth villiform or cardiform; end of supra-clavicle projecting backward, coarsely serrate; lateral line little curved, concurrent with the back; pseudobranchiæ small; dorsal and anal naked; opercle with spines; preopercle serrate, the serræ on lower limb antrorse; scales moderate, little ctenoid; supraoccipital crest rather long and low; top of cranium anteriorly as far as eyes perfectly smooth, without ridges, and very convex in section; interorbital area with a groove between the orbital ridges ..... PERCICHTHYS, 33.

aa. Palatine teeth obsolete; teeth in jaws subcylindrical, blunt; opercular spine obsolete; preopercle with a few minute serræ; snout bluntish; scales large, rough; forehead naked; lateral line bent under second dorsal ..... PERCILIA, 34.

Genus I.—RYPTICUS.

Rypticus Cuvier, Règne Animal, ed. II, 1829 (*saponaceus*).
Smecticus Valenciennes, Voyage de la Venus, 1855, 305 (*bicolor*).
Rhypticus Günther, I, 171, 1859 (corrected orthography).
Promicropterus Gill, Proc. Ac. Nat. Sci., Phila., 1861, 53 (*maculatus*).
Eleutheractis Cope, Trans. Am. Phil. Soc., 1870, 467 (*coriaceus*).

TYPE: *Anthias saponaceus*, Bloch and Schneider.
Etymology.—ῥυπτιχός, washing, from the "soapy" skin.

The species of this genus are all American, representing in our fauna the genus *Grammistes* of the coasts of Asia. The two genera agree in many particulars, differing chiefly in the fin formula, *Grammistes* having D. VII–I, 13, A. 0, 8, while *Rypticus* has D. II to IV, 21 to 26, A. 0, 14 to 17.

One of the species of *Rypticus* (*bicolor*) has been detached from the others to form a distinct genus, *Smecticus*, said to be characterized by a different number of fin-rays. (D. X, 21, A. II, 15.) Judging from the figure which Valenciennes has given of his *Smecticus bicolor* the species is a genuine *Rypticus*. Apparently some of the rudimentary or "stub" rays of the dorsal and anal have been taken for spines and enumerated accordingly. Another species has been taken to form still another genus, *Eleutheractis*, because the anterior dorsal is wholly separated from the other, not joined by a low membrane as usual in the genus. This character has but slight value, its presence depending to some extent on the condition of preservation of the specimen. *Promicropterus*, based on the species with two dorsal spines, may be regarded as a valid subgenus, but as no other character of importance goes with this one the value of the distinction is not great.

We revert to the original spelling of the name *Rypticus*, although the later *Rhypticus* is the correct form of the word.

The species of *Rypticus* are, with two exceptions, not well known. The various nominal species are probably reducible to six, *R. bistrispinus*, *nigripinnis*, *saponaceus*, *coriaceus*, *arenatus*, and *bicolor*, but we have not the material to demonstrate this.

ANALYSIS OF SPECIES OF RYPTICUS.

a. Dorsal spines, two. (*Promicropterus* Gill.)

b. Body comparatively deep, the depth more than length of head and more than one-third the length in the adult (less in the young); back considerably elevated; preopercle with two developed spines, only the uppermost usually obsolete; maxillary reaching to below posterior margin of eye, 2½ in head; a depression before eye, the sharp snout abruptly projecting; eye nearly as long as snout, 5½ in head; lower jaw much projecting; upper (median) spine on preopercle often divided, the lowermost larger, directed partly downward; opercular spines small; first dorsal spine a little longer than second, which is nearly or quite free from the soft rays; gill-rakers very short and thick, close set, about 8 or 10 developed; color dusky olive brown, somewhat clouded; sides with a few small irregular whitish spots; young with brownish spots; fins dusky, edge of caudal pale; head 3 in length; depth, 2⅓ to 2⅔. D. II, 25, A. 14 or 15.....BISTRISPINUS, 1.

bb. Body more slender, the depth about equal to length of head and less than one-third the length, even in the adult; back little elevated; preopercle with three distinct spines; maxillary 2⅔ in head, not quite reaching posterior border of eye; depression before eye slight, the profile not very uneven, slightly convex above eye; eye as long as snout, 5½ in head; lower jaw much projecting; preopercle with three distinct spines, the upper one small, the middle one largest, rarely divided; opercular spines, three, rather strong, the middle one largest; first dorsal spine slightly longer than second, which is nearly or quite free from the soft rays; gill-rakers short and thick, about 8 developed. Color brownish, irregularly mottled with whitish spots as large as the pupil, some of them with a darker center, these spots extending on all the vertical fins, sometimes wanting in the young, vertical fins and pectorals edged with dusky; head 3⅓ in length; depth about 3½. D. II, 26, A. 16.....NIGRIPINNIS, 2.

aa. Dorsal spines three (or four) (*Rypticus*).

c. Dorsal spines three only.

d. Preopercle with three spines, the uppermost blunt, and sometimes obsolete, the lower the largest; opercle with three strong spines, the middle one largest; body rather deep, the depth about equal to length of head and 3¼ in length to base of caudal; back moderately elevated; snout short, not very acute, the lower jaw much projecting; anterior profile steep and almost straight; eye 5½ in head; maxillary reaching beyond pupil, 2½ in head; first dorsal spine longest; dorsals slightly connected; ventral fins moderate, nearly twice as long as eye; pectorals rounded; gill-rakers short and thick. Color very dark olive brown, the fins all blackish; sides with vague blotches of light brown. Head, 3½; depth, 3½; D. III, 24; A. 16.....XANTI, 3.

dd. Preopercle with two spines only, the lower scarcely the longer.

e. Opercular spines three, all well developed.

f. (Color red, with darker cross-shades on sides of back; fins all dusky; dorsal fins well separated; body rather elongate. Head 3⅔ in length; depth 3⅔.) (*Valenciennes*) .....BICOLOR, 4.

ff. Color not red, chiefly olivaceous; dorsal fins distinctly connected by membrane.

g. Body comparatively deep, the depth in the adult about equal to length of head and 3 to 3⅓ in length to base of caudal; young more slender; back elevated; snout rather pointed; lower jaw much projecting; anterior profile before eye a little concave; eye 4½ to 5 in head; maxillary reaching posterior edge of eye, 2⅓ in head; preopercle with two straight spines behind; opercle with three spines, the middle one largest;

first and second dorsal spines subequal, the third smallest; dorsals slightly connected; ventrals very small, not half longer than eye; pectorals rounded; gill-rakers very small and short, about eight developed; color dusky brown, fins marked with blackish and usually with a narrow pale edge; sides generally with irregular pale spots; back and head usually immaculate. Head 3⅛ in length; depth 3¼. D. III, 25, A. 16 ..... SAPONACEUS, 5.

gg. [Body comparatively slender, the depth less than length of head. Color dark-brown, the head, throat, anal, dorsal, caudal, and base of pectoral thickly covered with small oblong or roundish dusky spots; these sometimes few and scattered or wholly wanting; vertical fins dark, narrowly edged with paler. Head 3⅓ in length with caudal; depth 4¼; eye 5½ in head. D. III, 23 to 25, A. 16.] (*Steindachner*). ARENATUS, 6.

ee. Opercular spines two, small, the uppermost the smaller (the lowermost being obsolete); dorsal fins separated; body moderately elongate, the back elevated, the head low, slender, and pointed, the anterior profile almost straight; lower jaw much projecting; eye small, smaller than in *R. saponaceus*, 5 to 5½ in head; about equal to the short snout; maxillary reaching posterior edge of eye, 2⅔ in head, preopercular spines short, bluntish, close together, the uppermost the smaller; first dorsal spine longest, the two fins well separated; ventrals moderate, nearly twice as long as eye; gill-rakers small and short; color (in our specimen) nearly plain brown, the edges of the scales darker with dark points; sides with some faint paler spots; edges of vertical fins dusky; head 3¼; depth 3⅓. D. III, 25, A. 15 .... CORIACEUS, 7.

cc. [Dorsal spines four; spines not described, probably as in *R. arenatus;* color brown; body and base of dorsal covered with round, jet-black spots, each surrounded by a clear ring; these spots lie in five longitudinal rows, those of the middle row much larger than the others; a sixth row on base of dorsal and 2 or 3 spots on base of anal; fins dusky, without paler margin; head 3⅓ in length (with caudal), depth 4½, D. IV, 22 or 23, A. about 12.] (*Steindachner.*) ..... NIGROMACULATUS, 8.

1. RYPTICUS BISTRISPINUS.

SOAP-FISH.

Bodianus bistrispinus Mitchill, Am. Monthly Magazine and Crit. Review, 247, Feb., 1818 (Straits of Bahama).

Rhypticus bistrispinus Jordan, Cat. Fishes of N. A., 86, 1885.

Rhypticus maculatus Holbrook, Ichth. S. Car., Ed. 1, 1856, 39, and Ed. 2, 1860, 42 (Cape Romain, South Carolina); Günther, I, 173, 1859 (copied); Jordan and Gilbert, Syn. Fishes of N. A., 543, 1883; Jordan, Proc. U. S. Nat. Mus., p. 35, 1884 (Pensacola.)

Rhypticus pituitosus Goode & Bean, Proc. U. S. Nat. Mus., 1879, 341 (Key West); Jordan and Gilbert, Syn. Fishes of N. A., 543, 1883.

Rhypticus bistrispinosus Jordan, Proc., U. S. Nat. Mus., 1884, p. 149 (Key West); Jordan, *op. cit.*, 546, (Newport); Jordan, Proc. U. S. Nat. Mus., 1886, 581 (*lapsus calami* for *bistrispinus*).

Promicropterus decoratus Cope, Proc. Ac. Nat. Sci., Phila., 118, 1870 (Newport, R. I.) (not of Gill).

Rhypticus decoratus Jordan & Gilbert, Syn. Fishes of N. A., 543, 1883 (copied).

Habitat.—South Atlantic coast of United States.

Etymology.—*Bistrispinus*, twice three spines.

Our specimens of this species are from Pensacola.

All the two-spined soap-fishes which we have seen from the Atlantic seem to belong to a single species, for which the oldest specific name is the long-neglected one of *bistrispinus* Mitchill. It is not uncommon in rather deep water off our South Atlantic coast.

2. RYPTICUS NIGRIPINNIS.

Rhypticus nigripinnis Gill, Proc. Ac. Nat. Sci., Phila., 1861, 53 (Panama); Jordan and Gilbert, Proc. U. S. Nat. Mus., 1882, 359 (Cape San Lucas); Jordan and Gilbert, *op. cit.*, 375 (Panama); Jordan and Gilbert, *op. cit.*, 381 (Panama); Jordan and Gilbert, *op. cit.*, 110 (Panama); Jordan, Proc. U. S. Nat. Mus., 1885, 378 (Cape San Lucas, Panama); Jordan, Cat. Fishes of N. A., 86, 1885; Jordan, Proc. U. S. Nat. Mus., 1889, 180 (Panama).

Rhypticus maculatus Gill, Proc. Ac. Nat. Sci., Phil., 1862, 251 (Cape San Lucas) (not of Holbrook).

Promicropterus decoratus Gill, Proc. Ac. Nat. Sci., Phila., 1863, 164 (Panama).

Rhypticus decoratus Günther, Fishes Cen. Am., 412, 1869 (Panama).

Habitat.—Pacific coast of tropical America, Cape San Lucas to Panama.

Etymology.—*Niger*, black; *pinna*, fin.

We have examined numerous specimens of this species, including the original types of *nigripinnis*, *maculatus*, and *decoratus*. There is no doubt whatever of the identity of these three. *Rh maculatus* Gill is said to have three dorsal spines, but this is an error, the first (broken) soft ray on the type having been counted as a spine. We have compared *R. nigripinnis* with *R. bistrispinus*, and find the two different, although very nearly related.

The chief distinctions are to be drawn from the slenderer body of *R. nigripinnis*, and from the presence of three distinct opercular spines, there being usually but two in *R. bistrispinus*, although the original meaning of the specific name of the latter implies the presence of three.

Our description is drawn from No. 29277, U. S. National Museum, taken by Professor Gilbert at Panama.

3. RYPTICUS XANTI.

Rhypticus xanti Gill, Proc. Ac. Nat. Sci., Phila., 1862, 250 (Cape San Lucas); Jordan and Gilbert, Proc. U. S. Nat. Mus., 1882, 359 (Cape San Lucas); Jordan and Gilbert, *op. cit.*, 371 (Colima); Jordan and Gilbert, *op. cit.*, 106 (Mazatlan); Jordan, Proc. U. S. Nat. Mus., 1885, 377 (Cape San Lucas).

Habitat.—Pacific coast of Mexico.

Etymology.—Named for John Xantus, the discoverer of the species.

This species differs from *R. saponaceus* of the Atlantic chiefly in the armature of the head. We have examined the original type, and also specimens from Colima and Mazatlan. Our description is drawn from No. 7740, U. S. Nat. Mus., collected by Mr. John Xantus, at Colima.

4. RYPTICUS BICOLOR.

Smecticus bicolor Valenciennes, Voyage de la Venus, Poissons, 307, Pl. ii, f. 2, 1855 (Galapagos Archip.).

Rhypticus bicolor Günther, I, 173, 1859 (copied).

Habitat.—Galapagos Archipelago.

Etymology.—*Bicolor*, two colored.

This species is known from the description and figure given by Valenciennes. The description speaks of ten dorsal and two anal spines, but it is evident from the figure that this is an ordinary *Rypticus*, the short or rudimentary rays of the dorsal and anal having been taken by Valenciennes for spines. The red coloration, as shown on the figure, is exceptional in this genus, and its correctness may be doubted. It is not un-

likely that the species is identical with *Rypticus xanti.* Possibly it is a deeper-water form, analogous to the red forms of certain species of *Mycteroperca.* The plate of this species (issued in 1846) is named "*Rypticus bicolor*," the name *Smecticus* appearing in the later text (1855).

5. RYPTICUS SAPONACEUS.

SOAP-FISH; JABON; JABONCILLO.

Jaboncillo Parra, Difer. Piezas de Hist. Nat., 51, lam. 24, f. 2, 1787 (Havana).

Anthias saponaceus Bloch and Schneider, Syst. Ichth., 310, 1801 (after Parra).

Rhypticus saponaceus Cuv. and Val., Hist. Nat. des Poissons, III, 63, 1829 (Brazil; Cape Verde); Storer, Syn. Fishes N. A., 289, 1846 (copied); Günther, I, 172, 1859 (Cape of Good Hope; St. Helena; West Indies; St. Vincent's, Jamaica); Gill, Proc. Ac. Nat. Sci., Phila., 1869, 52; Günther, Proc. Zool. Soc., Lond., 225, 1868 (St. Helena); Poey, Syn. Pisc. Cubensium, 297, 1868 (Havana); Cope, Trans. Am. Phil. Soc., 1870, 467 (St. Croix); Peters, Berliner Monatsberichte, 245, 1876 (Victoria, West Africa); Poey, Enumeratio, 34, 1875 (Havana); Poey, Fauna Puerto Riqueña, 322, 1881 (Porto Rico); Jordan, Proc. U. S. Nat. Mus., 35, 1884 (Pensacola); Jordan, Cat. Fishes N. A., 85, 1885; Jordan, Proc. U. S. Nat. Mus., 1886, 581; Jordan, *op. cit.*, 41 (Havana).

Rhypticus microps Castelnau, Anim. Nouv. ou Rares de l'Amer. du Sud, 6, 1855 (Bahia), (after *Perca microps* Broussonet, a MSS. name?).

Habitat.—West Indian fauna, Pensacola to West Africa and Brazil.

Etymology.—*Saponaceus*, soapy.

This species is the best known and most widely distributed of the soap-fishes. Our specimens are from Havana, Pensacola, and Bahia. The young specimens are much slenderer in form and more uniform in color than the adult, but we think that all belong to the same species.

The name *Rypticus microps* has been adopted for this species by Castelnau, on account of the early name *Perca microps* of Broussonet. We find, however, no published reference to this name except the statement by Cuvier, that a specimen bearing this MSS. name is in the museum at Paris. We doubt whether it has priority of publication over *Anthias saponaceus.*

6. RYPTICUS ARENATUS.

Rypticus arenatus Cuv. and Val., III, 65, pl. 45, 1829 (Brazil); Günther, Cat. Fish, Brit. Mus., I, 1859, p. 173. (Jamaica, Trinidad); Steindachner, Ichth. Notiz., VI, 41, 1867 (Barbadoes); Jordan Proc. U. S. Nat. Mus., 1886, 581.

? *Rhypticus subbifrenatus* Gill, Proc. Acad. Nat. Sci., Phila., 1861, 53 (St. Thomas).

Habitat.—West Indian Fauna.

Etymology.—*Arenatus*, sanded, from the speckled coloration.

We have not seen this species, and take our account of it chiefly from Dr. Steindachner.

The scanty description of a young example published by Gill, under the name of *Rhypticus subbifrenatus*, seems to approach very closely to *R. arenatus.* The following is the substance of Dr. Gill's account of *R. subbifrenatus.*

Color dusky, with remote dark spots; head with two series of spots; one series of four between orbit and opercular spine; the other of three smaller spots between eye and suprascapula; head 2¼ in length (3½ with caudal); depth 3¾ (4½ with caudal). D. III, 23. A. 15.

7. RYPTICUS CORIACEUS.

Eleutheractis coriaceus Cope, Trans. Am. Phil. Soc., 467, 1870 (St. Martin's).
Rhypticus arenatus Bean and Dresel, Proc. U. S. Nat. Mus., 1884, 163 (Jamaica).

Habitat.—West Indian Fauna.

Etymology.—Latin, *coriaceus*, leathery.

A specimen before us (30130, U. S. Nat. Mus.) from Kingston, Jamaica, seems to be identical with *Eleutheractis coriaceus* Cope. It seems to us to represent a valid species, distinguished from *R. saponaceus* by the weak armature of the head, and by the greater distance between the dorsal fins.

8. RYPTICUS NIGROMACULATUS.

Rhypticus nigromaculatus Steindachner, Ichth. Notiz., VI, 42, 1867. (Barbadoes.)

Habitat.—West Indian Fauna.

Etymology.—*Niger*, black; *maculatus*, spotted, from the black spots on body.

This species is based on a single specimen $1\frac{3}{4}$ inches long. Except that it is said to have four dorsal spines, the description agrees with that of *R. arenatus*, and *R. nigromaculatus* may prove to be simply an accidental variation of the latter.

Genus II.—POLYPRION.

Polyprion (Cuvier), Valenciennes, Mémoires du Muséum, XI, 265, 1824 (*cernium*).
Hectoria Castelnau, Proc. Zool. Soc. Vict., II, 1873, 1851 (*gigas=oxygeneios*).

TYPE.—*Polyprion cernium* Valenciennes.

Etymology.—*Πολὺς*, many; *πρίων*, saw, from the numerous serrations on head and fins.

This genus seems to be somewhat allied to *Epinephelus*, but it is readily distinguished from all the other *Serranidæ* by the armature of its head. The two known species inhabit the warm seas and reach a very great size.

ANALYSIS OF THE SPECIES OF POLYPRION.

a. Body robust, moderately elevated, the depth 3 in length; head, $2\frac{1}{4}$; mouth large, the maxillary reaching posterior border of eyes; teeth in villiform bands on jaws, vomer, palatines and tongue; supraocular region, supraclavicle, post-temporal, preopercle, and a ridge on the opercle spiniger-ous; dorsal fin low, with 11 strong spines; caudal rounded; anal spines short, serrate anteriorly, the third much the longest; ventrals large; pectoral short; color grayish-brown, the caudal edged with white; young clouded with light and dark. D. XI, 12, A. III, 8.....CERNIUM, 9.

aa. [Body more elongate; the depth $3\frac{1}{3}$ in length; head $2\frac{1}{3}$; armature of the head less developed than in *P. cernium;* dorsal spines 12; color, dark gray above, paler below. D. XII, 11, A, III 8,] (*Steindachner*).....OXYGENEIOS, 10.

9. POLYPRION CERNIUM.

(THE WRECK-FISH; STONE BASS; CERNIER.)

Polyprion cernium (Cuvier), Valenciennes, Mém. du Muséum, XI, 265, 1824; Cuv. and Val., Hist. Nat. Poiss. III, 21, pl. 42, 1829 (France; Italy); Günther I, 169, 1859 (Mediterranean); Day, Fish. Great Britain, 17, 1865, and of authors generally.
Holocentrus gillo Risso, Europe Méridionale, III, 367, 1826 (Nice).
Serranus couchi Yarrell, British Fishes, Ed. 1, 12, 1836.

Polyprion oxygenius Jordan and Gilbert, Syn. Fish. N. A., 532, 1883 (Deep water, off U. S. coast), not *Epinephelus oxygeneios* Bloch and Schneider.

Polyprion americanus Jordan, Cat. Fish. N. A., 83, 1885 (probably not *Amphiprion americanus* Bloch and Schneider).

Habitat.—Southern Europe, north to Norway and south to Cape of Good Hope, once taken in the Gulf Stream off the United States coast.

Etymology.—*Cernier*, French name for the species.

This large fish is not uncommon in the deep waters off the coast of Europe, especially southward. It is said to live most abundantly about wrecks; hence the common name of wreck-fish. It reaches a length of five or six feet. A single young specimen has been taken in the deep waters of the Gulf Stream by the United States Fish Commission.

10. POLYPRION OXYGENEIOS.

(HAPUKU.)

? *Amphiprion americanus* Bloch and Schneider, Syst. Ichth., 205, 1801, pl. XLVII (based on a drawing sent from Latham to Schneider of some fish called "*girom*" in America; called *Amphiprion australis* in the plate), (may have been based on a young example of *P. cernium*).

Epinephelus oxygeneios Bloch and Schneider, Syst. Ichth., 301, 1801 (based on Forster's MSS., Queen Charlotte's Island, near New Zealand).

Perca prognathus Forster, MSS. Lichtenstein Cat. Anim., 1844, 309 (Queen Charlotte's Island).

Polyprion prognathus Günther, Ann. Mag. Nat. Hist., 1887, 236 (discussion of synonymy).

Centropristis gigas Owen, Osteol. Cat. College Surgeons, I, 51. (Skeleton.)

Oligorus gigas Günther, I, 251, 1859.

Hectoria gigas Castelnau, Proc. Zool. Soc. Vict., II, 1873, 151.

Polyprion kneri Steindachner, Ichth. Beitr., II, 1, 1875 (Juan Fernandez Island). Günther, Shore Fishes, Challenger, 1880, 24 (Juan Fernandez).

Polyprion sp. Kner, Novara Fische, I, 28, 1865 (St. Paul Island).

Habitat.—South Pacific; coasts of South America and New Zealand.

Etymology.—ὀξύς sharp, γένειον chin.

We have not seen this species and know it only from the accounts given by Kner, Steindachner, and others.

It seems to us that the figure given by Bloch and Schneider of *Amphiprion americanus* is quite as likely to have been based on this species, which is really American, as on the European *Polyprion cernium*. The species is represented as more slender than the European fish, and the rough ridges on the head, very conspicuous in the European species, are not shown in this picture. Latham's drawing, on which Schneider's species was based, was said to have been made in America, where the fish is called "*Girom*." As there is no certainty in the identification of this figure, we have adopted the name *oxygeneios*, rather than *americanus*.

Dr. Günther has lately published a note on the synonymy of this species, which throws much light on its history. He adopts for it the specific name of *prognathus*, a name which although proposed by Forster when the species was discovered has lain in MSS. until the year 1844. If, however, the name occurs in any prior works of Forster, Parkinson, or Captain Cook, it should be adopted in preference to *oxygeneios*. We quote Dr. Günther's note in full:

[From the Annals and Magazine of Natural History for September, 1887.]

NOTE ON THE HAPUKU OF NEW ZEALAND (POLYPRION PROGNATHUS).

The Hapuku of New Zealand, one of the most highly esteemed food-fishes of the southern hemisphere, and attaining to a weight of 100 pounds, has been known to naturalists since Cook's visits to that country, as has been shown by Mr. Hutton (Trans. N. Z. Institt. v. p. 259). It was figured by Forster as well as by Parkinson, the former naming it *Perca prognathus*, a very appropriate term, to which I give preference before all others, although Schneider (Bl. Schn. p. 301) arbitrarily changed it into the less expressive *Epinephelus oxygenios*. Forster's original description is published in "Descript. Animal. ed. Lichtenstein," p. 309, and referred to by Cuvier (Cuv. & Val. Hist. Nat. Poiss. III. p. 29), who, with his perfect knowledge of fishes, recognized its relation to *Polyprion*, not doubting that it was the same species as the Atlantic *P. cernium*.

The figure left by Parkinson bears the name *Sciæna gadoides*, probably in Broussonet's handwriting; but this name seems to have remained always a MS. name.

The second period of the history of this fish begins with Owen, who, in the "Osteological Catalogue of the College of Surgeons," I. p. 51, described the skeleton of a New Zealand Percoid under the name of *Centropristis gigas*. In the "Catalogue of Fishes," I. p. 251, I stated the reasons which prevented me from adopting Professor Owen's view as to the generic affinity of this fish, which I thought, in the absence of specimens preserved entire, would prove to be rather with the Murray cod, *Oligorus*; and thus the fish appeared in nearly all subsequent publications as *Oligorus gigas*. Castelnau, however, ("Notes on the Edible Fishes of Victoria," 1873, p. 8, and Proc. Zool. Soc. Vict. II. 1873, p. 151), proposed to form a new genus for it, *Hectoria*, "on account of its armed tongue, double-pointed operculum, etc."

In more recent years the same fish has been found far from the place of its first discovery, viz., off the island of Juan Fernandez, and described by Steindachner as *Polyprion kneri* (Sitzungsb. Wien. Acad. lxxi. p. 443); also the *Challenger* obtained it off the same island (Chall. Shore Fish. p. 24).

Finally, the British Museum obtained from the Fisheries and Indo-Colonial Exhibitions specimens (in spirit as well as mounted) from New Zealand and Juan Fernandez*; and a direct comparison of these specimens can leave no doubt that all belong to the same species, which is antipodal to the only other species known, *Polyprion cernium*.

Lowe (Fish. Madeira, p. 185) has shown that *P. cernium* is a deep-sea fish, swimming near the surface when young, but living habitually at a depth of 300 and more fathoms when adult. The wide range of this genus is therefore not surprising; in fact we may well expect that *P. cernium* will be met with far beyond the limits of the northeastern Atlantic.

Genus III.—STEREOLEPIS.

Stereolepis Ayres Proc. Cal. Ac. Nat. Sci., 1859, 28. (*gigas*).

TYPE.—*Stereolepis gigas* Ayres.

Etymology.—Στερεός, firm; λεπίς, scale.

This genus contains a single species, one of the gigantic Serranoids known as "jew-fishes," rivaling in size *Polyprion cernium*, *Epinephelus nigritus*, and *Promicrops guttatus*.

The Australian genus *Oligorus* Günther is closely allied to *Stereolepis*, differing apparently in the greater number of soft rays in the dorsal and anal fins (D. XII, 14 to 16: A. III, 12).

ANALYSIS OF SPECIES OF STEREOLEPIS.

a. Body oblong, somewhat elevated, little compressed; head robust, the profile steeply elevated, the forehead broad and flattish; edges of preopercle and interopercle serrate, becoming nearly entire with age; crown, cheeks, and opercles scaly; snout, preorbital, and jaws naked; scales small,

*Those exhibited by the Chilian Government, and presented by them to the British Museum, bore the MS. name "*Perca fernandeziana*."

not strongly ctenoid, the surface rugose with radiating striæ; mouth large, lower jaw prominent; maxillary, with a well-developed supplemental bone, extending to below the eye; preorbital wide; teeth all villiform, in broad bands, on jaws, vomer, and palatines; dorsal spines stout, the last spines very much shorter than the middle ones, and all depressible in a deep groove; anal fin similar to soft dorsal, with three low stout spines; caudal fin broad, nearly truncate; pectorals moderate; ventrals long, reaching vent; color brownish with large black blotches, becoming with age nearly uniform greenish black; vertical fins in the young with a conspicuous pale edge; ventrals black. Head 3 in length; depth 3. D. XI, 10: A. III, 8; scales 115..... GIGAS, 11.

11. STEREOLEPIS GIGAS.

(THE CALIFORNIA JEW-FISH.)

Stereolepis gigas Ayres, Proc. Cal. Acad. Sci. 28, 1859; (Southern California) Jordan & Gilbert, Proc. U. S. Nat. Mus., 27, 1880, (San Diego); Jordan & Gilbert, Proc. U. S. Nat. Mus., 456, 1880; (Monterey Bay; Santa Barbara; San Diego); Jordan & Gilbert, Synopsis Fish, N. Am., 531, 1883; Jordan Cat. Fish. N. Am. 83, 1885.

Stereolepis californicus Gill, Proc. Acad. Nat. Sci. Phil., 330, 1863, (California) substitute for *gigas*, supposed to be preoccupied, but the *Centropristis gigas* of Owen is a *Polyprion*.

Habitat.—Coast of California, north to the Farallones.

Etymology: *gigas*, giant.

This huge fish is rather common about rocks on the California coast, from the Farallones southward to beyond San Diego. It reaches a weight of 400 to 500 pounds.

As it was thought likely that *Centropristis gigas* Owen (Osteol. Cat. 1853, 1, 51) from New Zealand might prove to be a species of *Stereolepis*, Dr. Gill has proposed to change the name of this species to *Stereolepis californicus*. This species of Owen, is now regarded as identical with *Polyprion oxygeneios*.

Genus IV.—HEMILUTJANUS.

Hemilutjanus Bleeker, Systema Percarum Revisum, Archives Neèrlandaises, XI, 1875,277. (Type *Plectropoma macrophthalmos* Tschudi).

TYPE—*Plectropoma macrophthalmos* Tschudi.

Etymology—ἡμι, half; *Lutjanus*, a genus of *sparoid* fishes, to which these fishes are in no way allied.

This is one of the most strongly marked of the Serranoid genera, showing resemblances at once with *Stereolepis*, *Plectropoma*, *Anthias*, and *Priacanthus*. But a single species is definitely known.

The name selected by Dr. Bleeker for this genus is peculiarly unfortunate, for besides the lack of euphony in the name, the genus has neither resemblance to nor affinity with the genus *Lutjanus*.

ANALYSIS OF SPECIES OF HEMILUTJANUS.

a. Color nearly uniform grayish, lateral line black; caudal lunate; body rather short, deep, compressed; anterior profile rather steep; snout sharp; profile with a concavity before and above eye, the nape convex; occipital keel sharp; interorbital space broad, concave next the sharp orbital ridges, the middle transversely convex; interorbital width 4½ in head, snout 4; nostrils roundish, close together, the posterior the larger; eye very large, 3⅓ in head; preorbital extremely narrow, about one-fourth width of pupil; mouth large, the lower jaw projecting; maxillary very broad and scaly, reaching posterior edge of pupil, $1\frac{9}{10}$ in head; supplemental maxillary very

broad, broader than in any other of the *Serranidæ*, scaly, its width scarcely less than that of the preorbital; teeth very small, in villiform bands; no canines; the outer teeth above very slightly enlarged; preopercle subrectangular, the perpendicular limb straight, vertical and finely serrate; angle with larger, radiating teeth; about ten small sharp teeth on the lower limb directed downward, the anterior directed slightly forward; top of head, maxillary, mandible, opercular bones, all parts of the head except the eye and lips closely covered with small rough scales, much as in the genus *Priacanthus;* scales on opercle small, like those on the cheeks; gill-rakers very long, about x+20, the longest 1⅓ in eye; opercular spines very weak; lateral line bent upward anteriorly, but not running high, the scales above it smaller than those below; dorsal and anal fins naked, but with a scaly sheath at base; dorsal spines low, the fifth highest, 3½ in head; soft dorsal rays few and rather long, their height not twice that of last spine, 3 in head; anal fin low, the spines strong, graduated; second anal spine 4 in head; caudal lunate, with rounded lobes; pectoral pointed, rather short, 1⅔ in head. Color dusky-silvery, the fins blackish; lateral line black, conspicuous, much as in *Centropomus undecimalis*. Head, 2¾ in length; depth, 2⅔. D. X, 11; A. III, 9. Scales, 66 (pores); 70 rows above lateral line, 100 below; 18 between first dorsal spine and lateral line.....MACROPHTHALMOS, 12.

aa. [Color reddish gray, with five large yellow spots on the side; caudal fin forked. D. X, 12; A. III, 7.] (*Günther*).....PAYTENSIS, 13.

12. HEMILUTJANUS MACROPHTHALMOS.

Plectropoma macrophthalmos Tschudi, Fauna Peruana, Ichth., 1845, 6. (Lurin, Callao.) Günther, I, 165, 1859; (copied). Kner, Neue Fische aus Museum Godeffroy, 1867, 3, plate. (Iquique).
Hemilutjanus (*macrophthalmus*) Bleeker, Systema Percarum Revisum, 1875, 277 (generic diagnosis).

Habitat.—Coasts of Peru and Chili.

Etymology.—*Μακρός*, large; *ὀφθαλμός*, eye.

We have examined specimens of this species in the museum at Cambridge from Peru and from Caldera, Chili. The specimen from which our account is taken (21716 M. C. Z.) is from the coast of Peru; E. G. Squire. It is about 11 inches in length. The species is well represented in the figure published by Dr. Kner.

13. HEMILUTJANUS PAYTENSIS.

Plectropoma paytensis Lesson, "Voyage de la Coquille, Zool. 233, 1828" (Payta.); Günther, I, 165, 1859. (Copied).

Habitat.—Coast of Peru.

Etymology.—Named from Payta, where it was first found.

We know nothing of this species except what is contained in the few words quoted by Dr. Günther from Lesson. It may not belong to *Hemilutjanus*, though, so far as it goes, the description accords with this genus. Possibly it is simply the young of *H. macrophthalmos*.

GENUS V.—GONIOPLECTRUS.

Gonioplectrus Gill, Proc. Ac. Nat. Sci., Phila., 1862, 236, 237 (*hispanum*).

TYPE.—*Plectropoma hispanum* Cuv. and Val.

Etymology.—*Γωνία*, angle; *πλήκτρον*, spur.

This well-marked genus contains a single species allied to *Plectropoma* and *Alphestes*, but with a stronger opercular armature than is found in any other genus. According to Poey, the skull "shows a great affinity with *Hypoplectrus*. Thus it is rounded above, the supraoccipital crest is below the level of the frontals; the other crests are low." In some respects *Gonioplectrus* resembles *Anthias*.

ANALYSIS OF SPECIES OF GONIOPLECTRUS.

a. Body short and deep, with very short, deep tail; interorbital region narrow, the bones rugose; snout $3\frac{2}{3}$ in head; maxillary reaching middle of orbit, 2 in head, naked, its supplemental bone well developed; preorbital narrow; lower jaw projecting; teeth very small, in narrow, villiform bands, the depressible teeth very few; a stout canine on each side, in front of each jaw, and one or two similar canines in middle of side of lower jaw; eye $4\frac{1}{3}$ in head (exclusive of opercular spine); preopercle finely serrate, with a single very large antrorse hook at its angle; opercle ending in four spines, the second of which is long, straight, compressed and knife-shaped, as long as eye; nostrils small, round, separated, the posterior the larger; suborbital serrate on its edge; gill rakers rather long and slender, x + 15; scales small, firm, and rough; lateral line arched, running high, close to middle of spinous dorsal, and then bent abruptly downward; dorsal spines low and stout, the fin notched; soft dorsal short and rather high; longest dorsal spine 3 in head; second anal spine $2\frac{2}{3}$, very strong, longer than third, the soft rays high and rather short, scaly; pectorals moderate, rounded at tip, longer than ventrals, $1\frac{1}{3}$ in head; caudal truncate, its peduncle as deep as long; color rose-colored, with yellow stripes along head and back; top of head with orange spots; a pale bar before vent; caudal fins sometimes with dark spots; fins otherwise plain; head $2\frac{1}{4}$ in length; depth $2\frac{2}{5}$. D. VIII, 13. A. III, 7, scales 70.

HISPANUS, 14.

14. GONIOPLECTRUS HISPANUS.

("SPANISH FLAG"; OUATILIBI ESPAGNOL; BIAJAIBA DE LO ALTO.)

Plectropoma hispanum Cuv. & Val., Hist. Nat. Poiss., II, 396, 1828, (Martinique); Storer, Synopsis Fish. N. Am., 282, 1846 (copied); Poey, Memor. Cuba, I, 72, plate 4, fig 1, 1851 (Havana); Günther, Cat. Fish Brit. Mus., I, 165, 1859 (copied).

Gonioplectrus hispanus Poey, Synopsis Pisc. Cubens., 289, 1868 (Havana); Poey, Enumeratio, 24, 1875 (Martinique).

Habitat.—West Indian fauna.

Etymology.—*Hispanus*, Spanish, its colors resembling those of the Spanish flag.

This species is known to us from specimens in the museum at Cambridge, sent from Cuba by Professor Poey.

Genus VI.—GILBERTIA.

Gilbertia Jordan, Genus nova.

TYPE.—*Plectropoma semicinctum* Cuv. & Val.

Etymology.—Named for Dr. Charles Henry Gilbert, of the University of Indiana.

The group of species of which *Plectropoma semicinctum* is the type seems to us to form a genus sufficiently distinct from *Plectropoma*. The latter genus (taking *Bodianus cyclostomus* Lac. (=*B. melanoleucus* Lac.) as its type,* has a much shorter dorsal fin (D., VIII, 11 or 12) and small scales. Both genera have lateral canines in the lower jaw. There are no American species in *Plectropoma* as now restricted.

Besides the typical species, *semicincta*, the three following, none of them examined by us, appear to belong to *Gilbertia*:

Plectropoma nigrorubrum Cuv. & Val. (Australia).

Plectropoma annulatum Günther (locality unknown) and *Plectropoma armatum* Castelnau (=*P. huntii* Hector), from Australia.

*This arrangement accords with the earliest restriction of *Plectropoma*, that made by Gill in 1862. Bleeker has since transferred the name *Plectropoma* to *Lates*, because of the three species placed by Cuvier in *Plectropoma*, the one standing first in the list was *Lates calcarifer*. To the genus called *Plectropoma* by Gill he has given the new name of *Paracanthistius*.

Plectropoma dentex Cuv. & Val., also from Australia, seems to belong to a different genus (*Colpognathus* Klunzinger, Sitzber. Akad. Wiss. Wien, 1879, LXXX, 339), having both jaws well scaled and three to six large canines on the side of the lower jaw. *Colpognathus dentex* has also the dorsal rays X, 18, and the antrorse teeth of the preorbital quite small.

I have taken pleasure in naming this genus for my friend and associate, Dr. Charles H. Gilbert.

ANALYSIS OF AMERICAN SPECIES OF GILBERTIA.

a. Body compressed, moderately elongate; head rather pointed, the profile straightish and not very steep; eye small, 5 in head; maxillary 2 in head; preorbital narrow, two-thirds diameter of eye; teeth quite small, in very narrow bands, the inner depressible; a stout canine on each side in front of each jaw, and a stout curved canine on each side of lower jaw; supplemental maxillary evident; jaws naked; top of head very narrow, transversely convex, scaly; interorbital width $10\frac{1}{2}$ in head; snout $3\frac{1}{3}$; preopercle rounded, arciform, rather finely and sharply serrate; two moderate teeth, hooked forward on its lower limb; opercular spines small; scales on opercles much smaller than those on cheeks, the latter in 15 rows; gill rakers short and slender, x+10, as long as pupil; scales rather large, ctenoid, those on breast small; lateral line running rather high; dorsal spines low, slender, the fifth longest, $2\frac{2}{3}$ in head; the last spine not half the height of the first soft ray, which is rather high, $2\frac{2}{3}$ in head; caudal rounded; anal rather low, the second spine high and strong, $2\frac{1}{3}$ in head; pectoral long, $1\frac{2}{3}$ in head. Color in spirits: body and fins pale, the fins nearly plain, the spinous dorsal and anal with dark edging; upper half of body with seven or eight broad black cross-bands wider than the interspaces, these somewhat irregularly confluent along sides, and not quite meeting below; top and sides of head with dark streaks; breast with dark longitudinal clouds. Head $2\frac{2}{3}$ in length; depth $2\frac{2}{3}$. D. X, 20. A. III, 8. Scales 52 (51 pores) ..... SEMICINCTA, 15.

15. GILBERTIA SEMICINCTA.

Plectropoma semicinctum Cuvier & Valenciennes, Hist. Nat. Poiss. IX, 442, 1833 (Juan Fernandez); Gay, "Chile.. Zool. II, 153, pl. 2, f. 1" (Chili).

?*Plectropoma semicinctum* Günther I, 160, 1859 (Australia); Steindachner, Zur Fisch-fauna, Port Jackson, 1866, 2 (Australia).

Habitat.—Coasts of Chili.

Etymology.—*Semi*, half; *cinctus*, belted.

We have examined two specimens of this species (4829 M. C. Z.), each about 6 inches in length, collected on the island of Juan Fernandez by Dr. Steindachner.

The coloration, the large scales, and the naked jaws give this fish a resemblance to the species of *Serranus*, but its real affinities are with *Epinephelus* and *Plectropoma*.

The Australian specimens referred by Günther and Steindachner to this species perhaps belong to some other.

GENUS VII.—ACANTHISTIUS.

Acanthistius Gill, Proc. Ac. Nat. Sci., Phila., 1862, 236 (*serratus*).

TYPE.—*Plectropoma serratum* Cuv. and Val.

Etymology.—ἄκανθα, spine; ἱστιον, sail or dorsal fin.

This genus is allied to *Plectropoma*, as restricted by Gill, a chief difference being the presence of thirteen dorsal spines instead of eight, as in *Plectropoma*. This character of having the spines in increased number seems to accord with the facts of its geo-

graphical distribution, the species of *Plectropoma* and of its allies with few dorsal spines, *Gilbertia* and *Alphestes*, belonging to tropical waters, while *Acanthistius* is characteristic of the south temperate zone. Our species of *Acanthistius* differ from the type of the genus in the presence of lateral canines, which are undeveloped in *Acanthistius serratus*. Less closely allied to *Plectropoma* are *Gonioplectrus* and *Hemilutjanus* while *Hypoplectrus*, usually associated with these, is a genuine ally of *Serranus*, having little except its plectroid armature in common with these grouper-like fishes.

ANALYSIS OF AMERICAN SPECIES OF ACANTHISTIUS.

a. Sides of lower jaw with small canines.

b. Body very short and deep, the depth $2\frac{1}{3}$ in length; preopercular spines moderate, 3 on lower limb; color plain dark brown or with paler cross shades; back elevated; anterior profile steep and straight; jaws subequal; mouth moderate, the maxillary reaching posterior border of eye, 2 in head; snout $4\frac{1}{6}$ in head; eye $4\frac{1}{6}$; preorbital narrow; interorbital space narrow, transversely convex; teeth small, about as in *Epinephelus*; canines small; lateral canines of lower jaw as large as upper anterior canines, and larger than antérior canines of lower jaw; nostrils small, round, not close together; preopercle rounded with moderate serræ above, these increasing in size downward; three serræ turned downward and forward on lower limb, besides two near angle also turned downward; opercular spines small; scales larger and rougher than in *patachonicus*; gill-rakers moderate, slender, x+14; lateral line normal in direction; dorsal spines rather slender, the longest $2\frac{2}{3}$ in head; dorsal deeply notched, the soft rays low; caudal peduncle short, compressed; caudal rounded; anal rounded, short and high, the second spine strongest, $2\frac{2}{3}$ in head; pectoral rather long, $1\frac{2}{3}$ in head. Color brown, nearly plain; fins dusky; young with paler cross-bands. Head $2\frac{2}{3}$ in length; depth, $2\frac{1}{3}$; D. XIII, 15; A. III, 8; scales 60 (pores), 86 in a longitudinal series ..... BRASILIANUS, 16.

bb. Body less deep; the depth $2\frac{2}{3}$ in length; preopercular spines very strong, 2 on lower limb; color brown, covered with darker reticulations. Body short and deep, the back elevated, the profile straight and rather steep; preorbital and teeth essentially as in *A. brasilianus*; jaws subequal; maxillary broad, scaleless, with well-developed supplemental bone; maxillary reaching posterior edge of pupil, $2\frac{1}{6}$ in head; eye large, $4\frac{1}{6}$ in head; snout short, $4\frac{2}{3}$; nostrils round, the posterior rather the larger; preopercle strongly and sharply serrate above, the teeth larger below; a strong tooth downward and backward at angle, with two strong antrorse hooks before it; opercular spines small, but distinct; gill-rakers long and slender, $1\frac{2}{3}$ in eye, x+13 in number. Scales small, roughish; lateral line normal in direction; scales below lateral line larger than those above; dorsal and anal fins low; longest dorsal spine, $2\frac{1}{2}$ in head; second anal spine $2\frac{2}{3}$; fourth soft ray of anal longest, $1\frac{1}{2}$ in head; caudal truncate, its peduncle moderate, compressed; pectoral rather long, $1\frac{2}{3}$ in head. Color brown, the body covered with a network of dark lines, which form sharply defined reticulations or vermiculations everywhere; these extending on scaly part of soft dorsal and anal, but not on head or on other fins; fins mostly dusky; young with about 4 dark cross-bars. Head $2\frac{1}{2}$ in length; depth $2\frac{2}{3}$. D. XIII, 15; A. III, 7 or 8; scales, 68 (pores) (the number in a longitudinal series above lateral line nearly 100)... PATACHONICUS, 17.

16. ACANTHISTIUS BRASILIANUS.

Plectropoma brasilianum Cuv. and Val., Hist. Nat. Poiss. II, 1828, 397 (Brazil): Günther, I, 164 (copied).
?? Plectropoma aculeatum Cuv. and Val., VI, 523, 1830 (Banc des Aiguilles). (Günther, I, 163 (copied).

Habitat.—Coast of Brazil.

Etymology.—*Brasilianus*, Brazilian.

The specimens of this species examined by us (4830 M. C. Z.) were collected at Rio de Janeiro by Dr. Steindachner. The short description of *Plectropoma aculeatum*, from the "Banc des Aiguilles," agrees with *A. brasilianus* in all respects so far as it goes. I am not certain as to the location of this bank, but the Point "des Aiguilles" is in northern New Zealand.

17. ACANTHISTIUS PATACHONICUS.

Plectropoma patachonica Jenyns, Voyage Beagle, Fishes, 1840, 11. (Mouth of the Rio de la Plata; east coast of Patagonia.)

Habitat.—Southeastern coasts of South America, north to Uruguay.

Etymology.—*Patachonicus*, Patagonian.

We have examined specimens of this species (4515 M. C. Z.) collected at Maldonado by Mr. Thomas G. Carey. Numerous specimens were also taken by the *Albatross* at points on the east coast of Patagonia, most of them off Cape San Matios. It is well distinguished from its congener, *A. brasilianus*, by the characters originally noticed by Mr. Jenyns, as well as by its coloration and the small size of its scales.

Genus VIII.—ALPHESTES.

Alphestes Bloch & Schneider, Syst. Ichthyol., 236, 1801 (*afer*).
Prospinus Poey, MSS.; Gill, Proc. Ac. Nat. Sci., Phila., 237, 1862 (*chloropterus* = *afer*).

TYPE.—*Epinephelus afer* Bloch.

Etymology.—Ἁλφηστής, greedy or incontinent, a name applied to a kind of fish that swims in pairs, one behind the other, possibly *Symphodus tinca*.

This genus contains a few species of small size, intermediate between *Plectropoma* and *Epinephelus*.

For the synonymy of its species see Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 394.

ANALYSIS OF SPECIES OF ALPHESTES.

a. Preopercle with a single strong antrorse spine below its angle; second anal spine longer than third; head small; scales mostly cycloid. D. XI, 17. A. III, 9. Scales 80.

b. Olivaceous, the ground color nearly uniform, the body and fins closely covered with small dark-brown spots; breast plain; snout slender, pointed; lower jaw rather strongly projecting. ..... MULTIGUTTATUS, 18.

bb. Olive, clouded with dusky, the body with rather few dark orange spots; breast with pearly spots; a dark mustache above the maxillary; lower jaw little projecting; preorbital very narrow..... AFER, 19.

aa. [Preopercle with two antrorse spines below the angle; second anal spine not longer than third, but stouter; canine teeth thick and blunt; third to fifth dorsal spines highest; caudal truncate, with rounded angles; ventrals reaching tips of pectorals, not to anal fin; scales ctenoid; color iron-gray, paler below; fins, except pectoral, dusky. Head, 2⅔; depth, 2⅔. D. XI, 17. A. III, 9. Scales 100.] (*Kner*)..... PICTUS, 20.

18 ALPHESTES MULTIGUTTATUS.

Plectropoma multiguttatum Günther, Proc. Zool. Soc., London, 1866, 600 (Panama).
Alphestes multiguttatus Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 107, 110 (Mazatlan; Panama); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 375.
Epinephelus multiguttatus Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 625 (Panama); Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 395 (Mazatlan; Panama).
Plectropoma afrum Günther, Fishes Centr. Amer., 411, 1869, with plate (Panama).

Habitat.—Pacific coast of tropical America; Mazatlan to Panama.

Etymology.—*Multum*, many; *guttatus*, spotted.

This species is common on the Pacific coast of tropical America, where it represents the closely related *A. afer*.

19. ALPHESTES AFER.

(GUASETA.)

Epinephelus afer Bloch, Ichthyologia, tab. 327, 1793 (Guinea?).
Alphestes afer Bloch & Schneider, Syst. Ichth., 1801, 236 (copied); Peters, Berliner Monatsber., 1865, 105 (description of Bloch's type); Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 396 (Cuba).
Plectropoma chloropterum Cuv. & Val., Hist. Nat. Poiss., II, 398, 1828 (San Domingo; Martinique); Poey, Memorias Cuba, i, 73, tab. 9, f. 3, 1851 (Havana); Vaillant & Bocourt, Miss. Sci. au Mexique, 107, pl. v, f. 3, 1875; Poey, Repertorio, i, 265, 1867.
Prospinus chloropterus Poey, Syn. Pisc. Cubens., 1868, 289 (Havana); Poey, Enumeratio, 1875, 18.
Plectropoma monacanthus Müller & Troschel, Schomburgk's Hist. Barbadoes, 665, 1848 (Barbadoes), Günther, Cat. Fish Brit. Mus., I, 164, 1859 (copied); Cope, Trans. Am. Phil. Soc., 1871, 467, (St. Martins).

Habitat.—West Indian fauna; Cuba to Brazil.
Etymology.—*Afer*, African.

This small fish is generally common in the West Indies. Our specimens are from Cuba and Bahia.

20. ALPHESTES PICTUS.

Plectropoma pictum Tschudi, Fauna Peruana, 5, 1844; Günther, Cat. Fish Brit. Mus., I, 164, 1859 (copied); Kner, Neue Fische aus. Museum Godeffroy, 1867, 2. (Iquique.)
Alphestes pictus Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 395 (copied).

Habitat.—Coast of Peru; not seen by us.
Etymology.—*Pictus*, painted.

This species may perhaps prove to be the type of a distinct genus. Our account is taken chiefly from the description of Dr. Kner.

Genus IX.—EPINEPHELUS.

Epinephelus Bloch, Ichthyologia, 1793 (in part; not species which suggested the name).
Cerna Bonaparte, Introduzione alla classe Pesci, Fauna Italica, tome III, pt. 1, 1833 (*gigas*).
Cynichthys Swainson, Nat. Hist. Classn. Fishes, II, 1839, 201 (*flavo-purpuratus*).
Cromileptes Swainson, Nat. Hist. Classn. Fishes, II, 1839, 201 (*gigas*, etc).
Epinephelus Bleeker, Gill, 1861, and of most American writers.
Hyporthodus Gill, Proc. Ac. Nat. Sci. Phila., 1861, 237 (*flavicauda* = *niveatus*).
Schistorus Gill, Proc. Ac. Nat. Sci. Phila., 1862, 237 (*mystacinus*).
Labroperca Gill, Proc. Ac. Nat. Sci. Phila., 1863, 80 (*labriformis*).
Merus Poey, Ann. Lyc. Nat. Hist. N. Y., about 1869 (*gigas*, etc).
Priacanthichthys Day, Proc. Zool. Soc. London, 1868 (young).
Cerna Doderlein, Rivista delle Specie del genere *Epinephelus* o *Cerna*, 1873 (*gigas*).
Hyposerranus Klunzinger, Fische des Rothen Meeres, 1884, 3 (*morrhua*).
Garrupa Jordan, subg. nov. (*nigritus*).
Serranus sp., auct. (*nec typus*).

TYPE.—*Epinephelus marginalis* Bloch.
Etymology.—επιυεφελος, clouded over, in allusion to the membrane supposed to cover the eye in *E. ruber* (*Mycteroperca*).

This is the largest and most important genus of the *Serranidæ*, and its species are most widely distributed.

Most of the American species of this genus have been already described in detail by Jordan & Swain (Proc. U. S. Nat. Mus., 1884, 379 *et seq.* To this account the reader is referred for description and synonymy. We have, however, in this paper omitted

E. sellicauda, which seems to be identical with *E. labriformis*. We have also added *E. flavolimbatus*, which we now regard as probably a valid species, *E. merus*, a recent addition to the American fauna, and the European species, *E. caninus*, *alexandrinus*, *chrysotænia*, *aspersus*, *æneus*, and *goreensis*.

We retain for this genus the old generic name *Epinephelus*, because, taking the successive restrictions which have followed its use by Bloch, its use by all authors would hold it with the present group.

The species of *Epinephelus* which suggested to Bloch the generic name is, however, a *Mycteroperca*, for the name (meaning clouded over) came from a supposed character of *Mycteroperca rubra* (*Epinephelus ruber* Bloch). Bloch & Schneider say of this species: "Oculi membrana communi quasi nebula ita obducta ut opaci esse videantur; unde nomen genericum." Bloch gives "Blödauge," dim-eye, as the German equivalent of *Epinephelus*. Should we regard the species which suggests the generic name as the type of the genus, the name *Epinephelus* must take the place of *Mycteroperca*, while the present genus would be called *Cerna*.

We think, however, that the restrictions made by different authors should determine the type. The gradual elimination of species would leave the genus as defined by Gill, and *Epinephelus marginalis* Bloch may be regarded as its type. This species is congeneric with *E. catus*, *E. striatus*, and other typical American forms. The name *Cerna* is then a synonym of *Epinephelus*.

We can find no description of the typical species of *Cynichthys* ("*flavopurpuratus*"), and we are not sure whether it belongs to this genus or not.

The genus *Epinephelus* is represented in all warm seas. Even after the removal of the numerous species here placed in other genera, it is by far the largest of all the genera of *Serranidæ*.

ANALYSIS OF SPECIES OF EPINEPHELUS FOUND IN AMERICA AND EUROPE.

a. Interorbital space of moderate width, its breadth more than half diameter of eye and 7 to 10 times in length of head; lateral teeth* of lower jaw in more than two rows, at least in the adult (*Epinephelus*).

b. Dorsal spines ten; caudal rounded; body with faint, dark cross-shades and many round, dark-orange spots, these extending on the fins; vertical fins not edged with black; preopercle without salient angle; lower jaw strongly projecting (in all respects, except the number of spines, almost identical with *E. adscensionis*).

ANALOGUS, 21.

bb. Dorsal spines eleven.

c. Second dorsal spine short, lower than third or fourth.

d. Preopercle without distinct spinules on its lower limb; nostrils subequal, the posterior usually not twice diameter of the anterior; pyloric cæca in small number, usually 10 to 25.

f. Body and head covered with red or orange spots (dusky in spirits and always darker than the ground color).

g. Vertical fins without dark edge; their bases spotted like the body; body with large pale spots besides the orange spots; young with large black blotches at base of dorsal; lower jaw strongly projecting; angle of preopercle not salient; form robust.

ADSCENSIONIS, 22.

*Lateral teeth of lower jaw in two rows only in the subgenus *Hyposerranus* Klunzinger.

gg. Vertical fins broadly edged with blue-black, their bases unspotted; body without pale spots, the orange spots rather small; lower jaw little projecting; preopercle with salient angle; body rather slender; size small ..... CATUS, 23.

ff. Body, head, and fins dark reddish brown, profusely covered with small pearly-white stellate spots; preopercle without salient angle; fins not edged with black; body robust; lower jaw projecting; caudal subtruncate, with sharp angles.

DRUMMOND-HAYI, 24.

fff. Body not covered with round red, orange or stellate white spots; spots, if any, bluish, whitish, or brownish, irregular or diffuse.

i. Preopercle without salient angle, the serræ at the angle scarcely enlarged; caudal fin rounded; (eye not surrounded by dark points; body without traces of longitudinal darker stripes); caudal peduncle with a large, quadrate black blotch above (sometimes obsolete in young or in very old examples); color (in spirits) dark brown, with scattered roundish blotches of pale blueish, these most distinct on breast and lower parts of head; fins pale, spotted like the body, their edges darker; young with large round, whitish spots, regularly arranged.

LABRIFORMIS, 25.

ii. Preopercle with a more or less distinct salient angle, which is armed with larger teeth (these teeth occasionally undeveloped in *E. striatus*, which species may be known by the presence of black points around the eyes).

k. Caudal peduncle with a large quadrate saddle-like black blotch above (sometimes wanting in *E. niveatus*, especially in the young); vertical fins not edged with black.

l. Eye surrounded by conspicuous dark brown points; body with irregular dark cross-bars; angle of preopercle little salient; third dorsal spine highest, 2¼ in head; scales moderate, about 100; caudal rounded; lower jaw little projecting; vertical fins in life broadly edged with yellow ..... STRIATUS, 26.

ll. Eye not surrounded by dark points; sides brown, marked with large blotches of steel-blue, these more or less regularly arranged and not distinct on the breast; no dark cross-bars; lower jaw strongly projecting; caudal fin subtruncate, its angles rather acute; pyloric cæca rather numerous. NIVEATUS, 27.

kk. Caudal peduncle without black, saddle-like blotch above.

n. Caudal fin truncate or emarginate when spread open, not convex behind; maxillary usually more or less scaly; vertical fins without broad edging of black.

o. Dorsal fin, or a part of it, distinctly edged with bright yellow.

p. Color of body uniform reddish brown, a clear blue streak from eye to angle of preorbital; a faint dark moustache; no black spots anywhere; whole dorsal with a bright yellow edging; anal and caudal without pale edging; caudal slightly lunate; maxillary scaly; dorsal rays X, 14; lower jaw strongly projecting (as in *Epinephelus niveatus*, with which this species seems to agree very closely in all respects except the color).

FLAVOLIMBATUS, 28.

pp. [Color of body dull greenish, the sides speckled with emerald-green; (dirty whitish in spirits); tips of anal, caudal, soft dorsal and pectoral saffron-yellow; four oblong, dark blotches on back below base of dorsal; body rather elongate; lower jaw projecting; dorsal rays XI, 16; caudal injured] (*Jenyns*).

ASPERSUS, 29.

oo. Dorsal fin without yellow edging.

q. Body without dusky longitudinal streaks.

r. Dorsal rays XI, 15 to 17.

s. [Color brown, with a large quadrate golden blotch on the side of the back, chiefly below the spinous dorsal; fins all low; the dorsal spines subequal; teeth at angle of preopercle strong; caudal fin lunate; body rather slender; the depth 3⅓ in length; maxillary partly scaly; lower jaw much projecting; dorsal rays XI, 16 or 17] (*Doderlein*).

CHRYSOTÆNIA, 30.

ss. [Color nearly uniform brown; the dorsal scarcely edged with darker; a black mustache along the maxillary, but no blue bands on cheek; maxillary chiefly naked; caudal fin truncate, with rather sharp angles; dorsal rays XI, 15 or 16; body not very robust, the depth 3½ in length (*Steindachner*).

GOREENSIS, 31.

rr. [Dorsal rays XI, 13 or 14; caudal fin truncate, the angles rounded; body robust; the depth 2⅔ in length; mouth large; maxillary scaly; lower jaw projecting; dorsal spines low, subequal; color uniform grayish] (*Doderlein*).....CANINUS, 32.

qq. [Body reddish, with three or four dusky longitudinal streaks along the side of the back; two dark streaks across cheek; caudal truncate, with rounded angles; maxillary nearly naked; dorsal rays XI, 15 or 16; body rather elongate, the depth 3½ in length; serræ at angle of preopercle very strong; fins rather low, the spines subequal] (*Doderlein*).

ALEXANDRINUS, 33.

nn. Caudal fin convex behind, the middle rays longest; maxillary naked.

t. [Dorsal rays XI, 13 or 14; vertical fins not edged with black; body rather slender, the depth 3½ in length; mouth moderate; dorsal spines unequal, the third and fourth a little longer than those following. Color olivaceous, three conspicuous, pale-blue streaks across the cheek and opercles] (*Doderlein*) .....ÆNEUS, 34.

tt. Dorsal rays XI, 15 or 16; vertical fins broadly edged with dark brown or black; color reddish brown, the adult nearly plain, the young with darker spots; preopercle with strong teeth at its angle, the lower limb entire; dorsal spines subequal, rather low; interorbital width moderate, about 6½ in head; caudal rounded; maxillary naked; body robust, the depth 3 in length.....GIGAS, 35.

dd. Preopercle with two or three small irregular teeth below its angle; posterior nostril very large, nearly three times diameter of anterior; head large; pyloric cæca in increased number (*Schistorus*); second and third anal spines about equal in length; color brownish, with about eight darker cross-bands; dark bands radiating from eye; a dark mustache above the maxillary; a dark blotch on back of tail.....MYSTACINUS, 36.

cc. Second dorsal spine elevated, not lower than third or fourth; caudal fins lunate; preopercular angle little salient, without enlarged teeth; interorbital width 7½ in head; color brown, clouded with whitish; lower parts flushed with orange-red; small dark spots about eye; vertical fins broadly edged with blue-black.....MORIO, 37.

aa. Interorbital area very broad, its width 4 to 6 times in length of head; caudal fin rounded; dorsal spines very unequal, the second considerably elevated; body very robust. (*Garrupa* Jordan).

u. Dorsal spines eleven, rarely ten; second dorsal spine longest, 2 to 3 in head, half longer than third spine; preopercle without salient angle, the serræ not much enlarged; canines strong; eye small; color chocolate brown, the distal part of the vertical fins rather darker; depth 2⅓ in length; D. XI, 14; A. III, 9; scales, 107.....NIGRITUS, 38.

uu. Dorsal spines ten; second dorsal spine elevated about 2⅔ in head; preopercle without salient angle, the teeth at and below the angle large and coarse, the lowermost turned downward; canines strong; eye small; color plain dark brown, the fins all darker; depth 2⅔ in length; dorsal rays X, 14; A. III, 9; scales 86. (A variety of preceding?)

MERUS. 39.

21. EPINEPHELUS ANALOGUS.

Epinephelus analogus Gill, Proc. Ac. Nat. Sci. Phila., 1863, 163 (Panama); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 232 (Acapulco); Jordan & Gilbert. *op. cit.*, 1882, 376 and 625 (Panama); Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 107, 110 (Mazatlan; Panama); Jordan & Bollman, Proc. U. S. Nat. Mus. 1889, 181 (Chatham Islands; Galapagos); Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 393 (Panama; Mazatlan).

Serranus analogus Günther, Fishes Centr. Amer., 1869, 410 (Panama); Steindachner, Ichth. Beitr., IV, 1871, 5 (Acapulco; Mazatlan; Panama).

Serranus courtadei Bocourt, Ann. Sci. Nat., Paris, 222, 1868 (La Union; San Salvador); Vaillant & Bocourt, Mission Scientifique au Mexique, 1875, 80.

Habitat.—Pacific coast of tropical America.

Etymology.—Analogus, similar, its form and coloration resembling those of *Epinephelus adscensionis.*

This species is common on the Pacific coast of Mexico, where it represents *E. adscensionis.*

22. EPINEPHELUS ADSCENSIONIS.

(ROCK HIND; CABRA MORA.)

Pira-pixanga or Gat-visch Marcgrave, Hist. Bras., 152, 1648 (Brazil).

Perca tota maculis, etc. Seba. "Thesaurus, iii, tab. 27."

Trachinus adscensionis Osbeck, Reise in China, etc., 1757, and English edition, 96, 1771 (Ascension Island).

Epinephelus ascensionis Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 391 (Cuba, Key West).

Trachinus punctatus Bonnaterre, Tableau Encycl. Method, 1788, 46 (after Osbeck).

? Perca stellio Walbaum, Artedi Piscium, 349, 1792 (after Seba).

Holocentrus punctatus Bloch, Ichthyol. VIII, taf. 241, 1790 (after Marcgrave).

Epinephelus punctatus Poey, Enum. Pisc. Cubens., 1875, 16 (Cuba); Poey, Anales Soc. Hist. Nat. Madrid, 1881, 319.

Perca maculata Bloch, Ichthyol., taf. 313, 1792 (on a figure by Plumier; not *Holocentrus maculatus* Bloch, tafel 242, an East Indian species of *Epinephelus = Holocentrus albofuscus* Lac.).

Serranus maculatus Peters, Berliner Monatsber., 1865, 109 (identification of *Perca maculata* Bloch).

Trachinus osbeck Lacépède, Hist. Nat. Poiss. (after Osbeck).

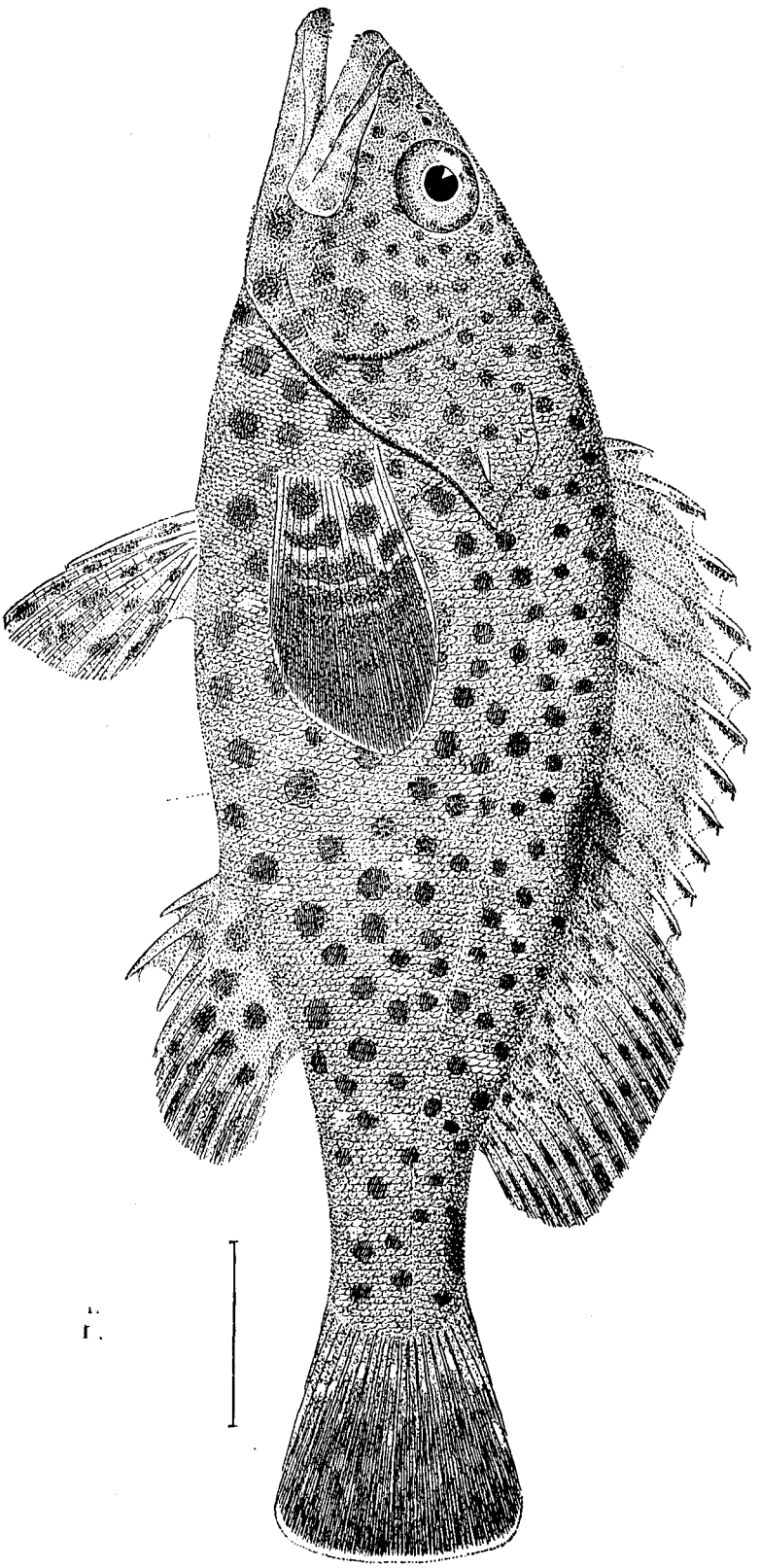
Sparus atlanticus Lacépède, IV, 158, pl. 5, f. i, 1803 (on a copy of a drawing by Plumier).

Epinephelus atlanticus Jordan & Gilbert, Syn. Fish. N. A., 1883, 918 and 973.

Serranus nigriculus Cuv. & Val., II, 375, 1828 (Martinique).

Serranus pixanga Cuv. & Val., II, 383, 1828 (on Marcgrave); Poey, Repertorio, I, 203.

Serranus impetiginosus Müller & Troschel, Schomburgk's Hist. Barb., 665, 848; Günther, I, 142, 1859 (Trinidad); Günther, Proc. Zool. Soc. Lond., 1868, 225 (St. Helena; name only); Günther, Shore Fishes, Challenger, 1880, 5 (Ascension); Steindachner, Ichth. Beitr., V, 127, 1876 (Bahia; Maranhaõ).



EPINEPHELUS ADSCENSIONIS (Osbeck). The Rock Hind.
(No. 26574, U. S. National Museum; from Key West, Florida.)

Serranus maculatus var. *impetiginosus* Peters, Berl. Monatsber., 1865, 110.
Epinephelus impetiginosus Poey, Repertorio, I, 201; Poey, Syn. Pisc. Cubens., 286, 1868 (Cuba); Jordan & Gilbert, Syn. Fish. N. A., 1883, 973.
Serranus capreolus Poey, Memorias Cuba, II, 1860, 145 (Cuba); Vaillant & Bocourt, Mission Scientifique au Mexique, 87 (Gulf of Mexico; Brazil; Ascension).
Epinephelus capreolus Jordan & Gilbert, Syn. Fish. N. A., 1883, 539 (specimen from Key West described).
Serranus varius Bocourt, Ann. Sci. Nat. Paris, 1868, 222 (Gulf of Mexico).

Habitat.—West Indian fauna, Florida Keys to Brazil; Ascension and St. Helena Islands.

Etymology.—*Adscensionis*, from Ascension Island, where the species was first taken.

Specimens of this common species from Bahia are in the museum at Cambridge and in the U. S. National Museum.

23. EPINEPHELUS CATUS.

(CABRILLA; RED HIND.)

Cugupuguacu Brazil, the Hind, Catesby, Nat. Hist. Carol., etc., 1743, tab. 14 (Bahamas).
Cabrilla Parra, Dif. Piezas, Hist. Nat. Cuba, 1787 (Havana).
Perca guttata Linnæus, Syst. Nat., X, 1758, 292 (in part, not type; after Marcgrave, Sloane, Willoughby, Ray, and Catesby, the figure of Catesby only belonging to this species).
Epinephelus guttatus Goode, Bull. U. S. Nat. Mus., V, 1876, 58 (Bermudas); Jordan & Gilbert, Syn. Fish. N. A. 1883, 919, 973 (specimens examined from Florida Keys); Bean, Proc. U. S. Nat. Mus., 1880, 99 (Bermuda; Florida).
Serranus apua Cuv. & Val., II, 1828, 287 (Brazil; citing as synonym Piratiapia of Marcgrave, and of authors; not *Bodianus apua* Bloch, Günther, I, 140, 1859 (Jamaica); Steindachner, Ich. Notiz., VI, 43, 1867 (Barbadoes; Surinam); Günther, Shore Fishes, Challenger Exp. 1880, 6 (St. Thomas).
Epinephelus apua Jordan & Gilbert, Syn. Fish N. A., 973 (name only); Jordan & Swain, Proc. U. S. Nat. Mus. 1884, 389 (Havana).
Lutjanus lunulatus (bis) Bloch & Schneider, Syst. Ichthyol., 1801, 329 (after *Cabrilla* Parra; not *Lutjanus lunulatus* Bloch & Schneider).
Serranus lunulatus Cuv. & Val., II, 1828, 379 (after Parra); Steindachner, "Ichthyol. Mittheil., IX, 1866, 15"; Poey, Repertorio, I, 200.
Epinephelus lunulatus Poey, Synopsis Pisc. Cubens., 1868, 286; Poey, Enum. Pisc. Cub., 1875, 16 (Havana); Cope, Trans. Am. Philos. Soc., 1871, 465 (St. Martin's; St. Kitt's; New Providence).
Serranus catus Cuv. & Val., II, 373, 1828 (Martinique); Guichenot, Ramon de la Sagra, Cuba, II, 13, 1850.
Serranus maculatus var. *catus* Peters, Berliner Monatsber., 1865, 110 (Martinique; Barbadoes, Puerto Cabello).
Serranus arara Cuv. & Val., II, 1828, 377 (Havana; erroneously identified with *Bonaci ararâ* Parra); Poey, Repertorio, I, 200.
Serranus maculatus Günther, I, 1859, 130 (West Indies; not *Perca maculata* Bloch); Vaillant & Bocourt, Mission Scientifique au Mexique, IV, 1875, 83 (Jamaica).
Epinephelus cubanus Poey, Repert. Fis.-Nat. Cuba, I, 1867, 202 (Cuba); Poey, Syn. Pisc. Cub., 1868, 287; Poey, Enumeratio Pisc. Cub., 1875, 17.
Serranus maculatus var. *cubanus* Peters, Berliner Monatsber., 1865, 110 (Cuba).

Habitat.—West Indies; Florida Keys; Bermudas; Brazil.

Etymology.—Low Latin, *catus*, a cat; from Latin *catus*, sly, wary.

We here reject the name *apua* formerly used by us for this species, the original *Bodianus apua* of Bloch being in our opinion based on the red variety of *Mycteroperca venenosa*. The name *guttatus* L. is based chiefly on the Cugupuguacu of Marcgrave, with which Catesby had erroneously identified his "Hind," which is the present spe-

cies. The oldest tenable name of this fish, so far as we can see, is certainly *Epinephelus catus*. Willoughby's "Cugupuguacu" is certainly identical with Marcgrave's, both as to figure and description.

In the museum at Cambridge are specimens from Charleston, Tortugas, Nassau, St. Thomas, Gonaives, Hayti, and St. Croix.

24. EPINEPHELUS DRUMMOND-HAYI.

(SPECKLED HIND; JOHN PAW.)

Epinephelus drummond-hayi Goode & Bean, Proc. U. S. Nat. Mus., 173, 174, 1878 (Pensacola; Bermuda); Goode & Bean, *op. cit.*, 115, 139, 1879; Jordan & Gilbert, *op. cit.*, 272, 1882; Jordan & Gilbert, Synopsis Fish. N. Am., 340, 1883; Jordan & Swain, *l. c.*, 388 (Pensacola); Jordan & Eigenmann, Proc. U. S. Nat. Mus. 1887, 269 (Charleston).

Habitat.—Bermudas; South Atlantic and Gulf coast of the United States.

Etymology.—Named for "Col. H. M. Drummond Hay, C. M. Z. S., of Leggieden, Perth, Scotland, formerly of the British army, by whom the species was first discovered at the Bermudas in 1854."

We have lately received a specimen of this beautiful species from Charleston.

25. EPINEPHELUS LABRIFORMIS.

Serranus labriformis Jenyns, Zoöl. of Beagle, Fishes, 8, pl. 3, 1840;* Günther, Cat. Fishes Brit. Mus., I, 152, 1859 (Galapagos Islands), Jordan & Swain, *l. c.*, 1884, 387 (copied); Jordan & Bollman, Proc. U. S. Nat. Mus. 1889, 180 (Charles Island and Indefatigable Island, Galapagos).

Epinephelus sellicauda Gill, Proc. Ac. Nat. Sci. Phila., 250, 1862 (Cape San Lucas); Jordan & Gilbert, Proc. U. S. Nat. Mus., 229, 1881 (Socorro Island); Jordan & Gilbert, *op. cit.*, 360, 1882 (Cape San Lucas); Jordan & Gilbert, *op. cit.*, 371, 1882 (Colima); Jordan & Gilbert, *op. cit.*, 625, 1882 (Panama); Jordan & Gilbert, Bull. U. S. Fish Comm., 107, 1882 (Mazatlan); Jordan & Swain, *l. c.*, 385 (Socorro Island; Mazatlan, Colima, Panama, Cape San Lucas).

Epinephelus ordinatus Cope, Trans. Am. Phil. So., 466, 1871 (Panama).

Habitat.—Pacific coast of tropical America; Cape San Lucas to Galapagos Islands.

Etymology—Labrus, a genus of Wrasse fishes; *forma*, form.

This species is abundant in the Galapagos Islands, from which locality many specimens have been brought to the museum at Cambridge. Although neither Jenyns nor Darwin have noted the saddle-like dark blotch on the tail in the species called by Jenyns *labriformis*, there seems to be little doubt of the identity of *labriformis* and *sellicauda*. This identification has been already suggested by Dr. Steindachner on the labels in the museum at Cambridge.

Specimens are in the museum at Cambridge from Acapulco, and from Albemarle Island, in the Galapagos.

26. EPINEPHELUS STRIATUS.

(NASSAU GROUPER; HAMLET; CHERNA CRIOLLA.)

Cherna Parra, Piezas de Hist. Nat. Cuba, 1787, 50, lam. XXIV (Cuba).

Anthias striatus Bloch, Ichth., IX, 109, tab. 324, 1792 (on a figure by Plumier); Bloch & Schneider, Syst. Ichthyol., 1801, 305 (copied).

Lutjanus striatus Lacépède, Hist. Nat. Poiss., IV, 324, 1803 (copied).

Serranus striatus Cuv. & Val., ii, 1828, 288 (Gulf of Mexico); Storer, Syn. Fish, N. A., 1846, 27 (copied); Guichenot, Ramon de la Sagra's Hist. Cuba, Poiss., 1850, 12 (Cuba); Günther, I, 1859, 110 (Cuba; Mexico; Puerto Cabello; Bahia); Poey, Repertorio, I, 198, 1867; Vaillant & Bocourt, Mission Scientifique au Mexique, 1875–'76 (Cuba; San Domingo; Martinique; Jamaica).

* Not 1842, as usually quoted. This work was issued in parts bearing date of 1840, 1841, and 1842.

Epinephelus striatus Gill, Proc. Ac. Nat. Sci. Phila., 1865, 105 (name only); Poey, Repertorio, II, 285, 1868 (Havana); Poey, Syn. Pisc. Cub., 1868, 310; Poey, Enum. Pisc. Cub., 1875, 15; Goode, Bull. U. S. Nat. Mus.. V, 1876, 57 (Bermudas); Cope, Trans. Am. Phil. Soc., 1871, 466 (New Providence; St. Croix); Bean, Proc. U. S. Nat. Mus., 1880, 99 (Bermuda); Poey, Anales Hist. Nat., 319, 1881 (Puerto Rico); Jordan & Gilbert, Syn. Fish. N. A., 1883, 918; Poey, Bull. U. S. Fish Comm., 1882, 118; Jordan, Proc. U. S. Nat. Mus., 1884, 125 (Key West); Jordan & Swain, *l. c.*, 384 (Key West; Havana).

Anthias cherna Bloch & Schneider, Syst. Ichth., 1801, 310 (after Parra).

Sparus chrysomelanurus Lacépède, IV, 1803, 160 (on a copy of Plumier's figure).

Habitat.—West Indian fauna, Key West to Brazil.

Etymology.—*Striatus*, striped.

Specimens of this species are in the museum at Cambridge from Santo Tomas and from Cartagena, besides various more northern localities.

27. EPINEPHELUS NIVEATUS.

Serranus niveatus Cuv. & Val., II, 1828, 380 (Brazil); Castelnau, Anim. nouv. ou rares de l'Amér. du Sud, Poiss., pl. i, f. 2 (coast of Brazil); Günther, I, 130 (copied); Poey, Repertorio, I, 202.

Epinephelus niveatus Poey, Synopsis Pisc. Cubens., 1868, 286 (Havana); Poey, Enum. Pisc. Cubens., 1875, 15; Jordan & Gilbert, Syn. Fish. N. A., 1883, 541; Jordan & Swain, *l. c.*, 386 (Havana).

Serranus margaritifer Günther, Cat. Fish. Brit. Mus., I, 1859, 131 (South America).

Serranus conspersus Poey, Memorias Cuba, II, 139, 1860 (Havana); Poey, Repert., II, 157, 1868.

Hyporthodus flavicauda Gill, Proc. Ac. Nat. Sci. Phila., 1861, 98 (young specimen, taken at Newport, R. I.); Cope, Proc. Ac. Nat. Sci. Phila., 1870, 119 (same specimen).

Habitat.—West Indies to Brazil, occasionally northward in the Gulf Stream.

Etymology.—*Niveatus*, snowy.

Specimens of this species are in the museum at Cambridge from Cuba and from Rio Janeiro. Some of the Cuban specimens lack the saddle-like blotch on the tail, but in all the pearly spots on the side are persistent.

28. EPINEPHELUS FLAVOLIMBATUS.

(YELLOW-FINNED GROUPER.)

Epinephelus flavolimbatus Poey, Repertorio, I, 183, 1867 (Cuba); Poey, Synopsis, 1868, 286; Poey, Enum., 1875, 15; Jordan & Evermann, Proc. U. S. Nat. Mus., 1886, 475 (Pensacola).

Habitat.—West Indian fauna, north to Pensacola.

Etymology.—*Flavus*, yellow; *limbus*, edge.

Since the paper by Jordan & Swain was published, three specimens of this species have been obtained at Pensacola by Mr. Stearns. These differ a little from Poey's account, but they evidently belong to the same species as the *E. flavolimbatus* of Poey. In all details of form the species seems to agree fully with *E. niveatus*, but the coloration is quite unlike that of the latter species, and so sharply defined that we have not much hesitation in admitting it as a distinct species. The coloration is described in detail by Jordan & Evermann in the paper above quoted.

29. EPINEPHELUS ASPERSUS.

Serranus aspersus Jenyns, Voyage Beagle, Fishes, 1842, 6 (Porto Praya, St. Jago in the Cape Verde Islands).

Habitat.—Cape Verde Islands.

Etymology.—*Aspersus*, speckled.

This species is known from Dr. Jenyns's account of a young example taken at Porto Praya. No one has since recognized the species. Jenyns's account agrees in many respects with *E. flavolimbatus*, and his species may prove to be the young of the latter.

30. EPINEPHELUS GOREENSIS,

Serranus goreensis Cuv. & Val. VI, 511, 1830 (Gorea); Jenyns, Voyage of the Beagle, Fishes, 1840, 5 (St. Jago; Porto Praya; Cape Verde Islands); Günther I, 133 (copied); Steindachner, Beiträge zur Kenntniss der Fische Afrika's, 6, 1881, with plate (Gorea; Rufisque; Canary Islands).

Habitat.—Coast of Africa and islands in the eastern Atlantic.

Etymology.—*Goreensis*, from the island of Gorea, where the species was discovered.

This species is known to us from descriptions and from Dr. Steindachner's excellent figure. It seems to be nearly allied to *Epinephelus gigas* and to *E. æneus*.

31. EPINEPHELUS CHRYSOTÆNIA.

Cerna chrysotænia Doderlein, Rivista delle specie del Genere *Epinephelus* o *Cerna*, 41, plate ii, f. 4, 1882 (Palermo).

Habitat.—Mediterranean Sea.

Etymology.—*Χρυσός*, gold; *ταινία*, band.

This species is known from Professor Doderlein's description only.

32. EPINEPHELUS CANINUS.

Serranus caninus Valenciennes, Webb & Berthelot, Ichth. Îles Canaries, 40, 1836 (Canaries).
Cerna canina Doderlein, Rivista, Epinephelus, 1882, 26, tav. 1, f. 2 (full description and synonymy).
Serranus cernioides Capello, Catal. Peix. Portug. Part III, 156 et Part III, 244, estamp. iv, f. 1, 1867 (Portugal).

Habitat.—Mediterranean Sea; Atlantic coasts of southern Europe and northern Africa.

Etymology.—*Caninus*, canine.

Our knowledge of this species is chiefly drawn from Professor Doderlein's "Rivista," quoted above.

33. EPINEPHELUS ALEXANDRINUS.

? *Sparus scirenga* Rafinesque, Caratteri de Alcuni nuovi Genere, etc., 1810, 50 (Palermo).
Serranus alexandrinus Cuv. & Val., Hist. Nat. Poiss., II, 281, 1829 (Alexandria, Egypt).
Plectropomus fasciatus Costa, Fauna del Regno di Napoli, Pesci, 1844, tav. vi, f. 1, 2, 5 (not *Holocentrus fasciatus* Bloch) (Naples).
Serranus costæ Steindachner, Ichth. Beiträge, VI, 11, 1878 (Mediterranean).
Cerna costæ or *Cerna alexandrina* Doderlein, Rivista di *Epinephelus* o *Cerna*, 1882, 47, et seq. tav. iii, f. 7.

Habitat.—Mediterranean Sea.

Etymology.—*Alexandrinus*, from Alexandria, Egypt, where the species was first found.

We have drawn our knowledge of this species chiefly from the account given by Professor Doderlein. If we can place any dependence whatever on Rafinesque's descriptions, his *Sparus scirenga* is more likely to be this species than *Mycteroperca rubra* or any other of the Serranoid fishes which are found in the waters of Sicily. The character of yellowish longitudinal stripes along the flanks and of caudal fin entire seem to point to this species rather than to any other. The following is Rafinesque's account:

"136. Sp. SPARUS *Scirenga.*—Olivastro, alcune linee longitudinali giallastre ai lati de la testa e dei fianchi, opercolo angolato superiormente, linea laterale curva, coda iguale intiera, *Oss.* Il suo nomine volgare è l' istesso che il suo specifico, e gli è comune con un pesce molto diverso il *Notognidion scirenga;* hà il muso appuntato, l' iride rossa indorata, ed un solo raggio spinoso all' anale; la sua carne non è disprezzevole e giunge alla lunghezza di due piedi; non sono certo se appartiene effetivamente a questo genere e dubbito che abbia molto affinitá col genere *Lutianus.*"

34. EPINEPHELUS ÆNEUS.

Serranus æneus Isidore Geoffroy Saint-Hilaire, "Poissons de l'Égypte ed. Panckoucke, 208, 1809" (Egypt).

Cerna ænea Doderlein, Rivista delle specie del Genere *Epinephelus* o *Cerna*, 1882, 34, tav. ii, f. 3 (with full description and synonymy).

Habitat.—Mediterranean Sea.

Etymology.—*Æneus*, brassy.

We have not studied this species, and we draw our, account of it from the paper of Professor Doderlein.

35, EPINEPHELUS GIGAS.

(MEROU.)

? *Labrus guaza* Linnæus, Syst. Nat., ed. X, 285, 1758 ("*Habitat* in Pelago," may be *E. nigritus*).

Perca gigas Brünnich, Ichthyol. Massiliensis, 65, No. 81, 1768 (Marseilles).

Holocentrus gigas Bloch & Schneider, Syst. Ichth., 1801, 322 (copied).

Serranus gigas Cuv. & Val., II, 270, pl. xxxii, 1828; Günther, I, 132, 1859 (Madeira; Cape of Good Hope); Steindachner, Ichth. Berichte, IV, 11, 1867 (excl. syn. pars; Barcelona; Tangier; Lisbon; Teneriffe); Steindachner, Ichth. Beitr., XII, 6, 1882 (comparison with *Epinephelus caninus*); Steindachner, Ichth. Beitr., 1876, V, 127 (Canary Is.; Madeira; Cape Verde; Cape of Good Hope; Brazil); Day, British Fishes, 16, pl. v. (south coast of England) and of European authors generally.

Cerna gigas Doderlein, Rivista del Genere *Epinephelus* o *Cerna*, 1882, 10, tab. 1, f. 1.(detailed description and synonymy).

Epinephelus gigas Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 388 (copied).

Holocentrus merou Lacépède, Hist. Nat. Poiss., IV, 377, 1803 (after Brünnich).

Serranus mentzeli Cuv. & Val., II, 291, 1828 (coast of Brazil); Günther, I, 140, 1859 (copied).

Serranus dichropterus Cuv. & Val., II, 293, 1828 (Brazil; not type, which was from Japan, having been also the type of *Holocentrus ongus* Bloch).

Perca robusta Couch, "Mag. Nat. Hist., 1832, V, 21, f. 7" (Polperro).

Serranus marginatus Lowe, "Proc. Zool. Soc. Lond., 1833, 142" (Madeira).

Serranus fimbriatus Lowe, "Trans. Cambr. Phil. Soc., 1836, 195, pl. i" (Madeira).

Serranus ongus Günther, I, 1859, 142 (Bahia; not *Epinephelus ongus* Bloch, a Japanese fish).

Epinephelus brachysomus Cope, Trans. Am. Phil. Soc. Phila., 1871, 466 (Rio Janeiro).

Habitat.—Eastern Atlantic; Mediterranean; coast of Brazil.

Etymology.—*Gigas*, giant.

We have compared Brazilian specimens (*Epinephelus mentzeli*) with the descriptions of this species given by Professor Doderlein and by Dr. Day. We can find no difference whatever, and we agree with Dr. Steindachner in regarding the two as identical.

The following description is taken from No. 4506, M. C. Z., 15 inches long, collected at Rio de Janeiro by Professor Agassiz:

Head, $2\frac{1}{3}$ in length; depth, $2\frac{3}{4}$. D. XI, 15, A. III, 8; scales 17–85 to 90–x. Body rather deep; profile steep; snout short, rather pointed; lower jaw little projecting; canines small; preopercle without salient angle, the teeth just above the angle large and strong; lower limb of preopercle entire. Gill rakers very short, x + 15. Interorbital space narrow, not as wide as eye, which is $5\frac{3}{4}$ in head; maxillary $2\frac{2}{5}$ in head. Third dorsal spine highest, $2\frac{3}{4}$ in head. Anal high and rounded, its second spine 5 in head; caudal rounded.

Color, in spirits, dark brown, with rather faint round whitish spots which are irregular and arranged somewhat in vertical rows, and most distinct on caudal peduncle. Dorsal, anal, caudal, and pectorals broadly edged with black. Other specimens from Rio de Janeiro and Santos belong to the same species. There is not much doubt that *Epinephelus brachysomus* Cope, and the Brazilian specimens referred by Cuvier and Valenciennes to *Epinephelus dichropterus* belong to this form.

The *Labrus guaza* Linnæus is some species of *Epinephelus*, with the caudal rounded, the color dusky, and the dorsal rays XI, 16. *Guasa* is the Spanish name in the West Indies for *Promicrops guttatus* and other large *Serranoids*.

The following key to the Mediterranean species of *Epinephelus* is translated from that given by Vinciguerra (Risultate Ittiologici del Violante, 1883, 33):

a. Upper jaw naked; caudal rounded.
  b. Opercle without oblique lines ..... GIGAS.
  bb. Opercle with oblique lines ..... ÆNEUS.
aa. Upper jaw with small scales; caudal truncate or concave.
  c. Dorsal with 13 or 14 soft rays ..... CANINUS.
  cc. Dorsal with 16 soft rays ..... ALEXANDRINUS.

36. EPINEPHELUS MYSTACINUS.

(CHERNA DE LE ALTO.)

Serranus mystacinus Poey, Memorias Cuba, I, 52, 1851, tab. 10, f. 1 (Cuba); Günther, I, 109, 1859 (South America).

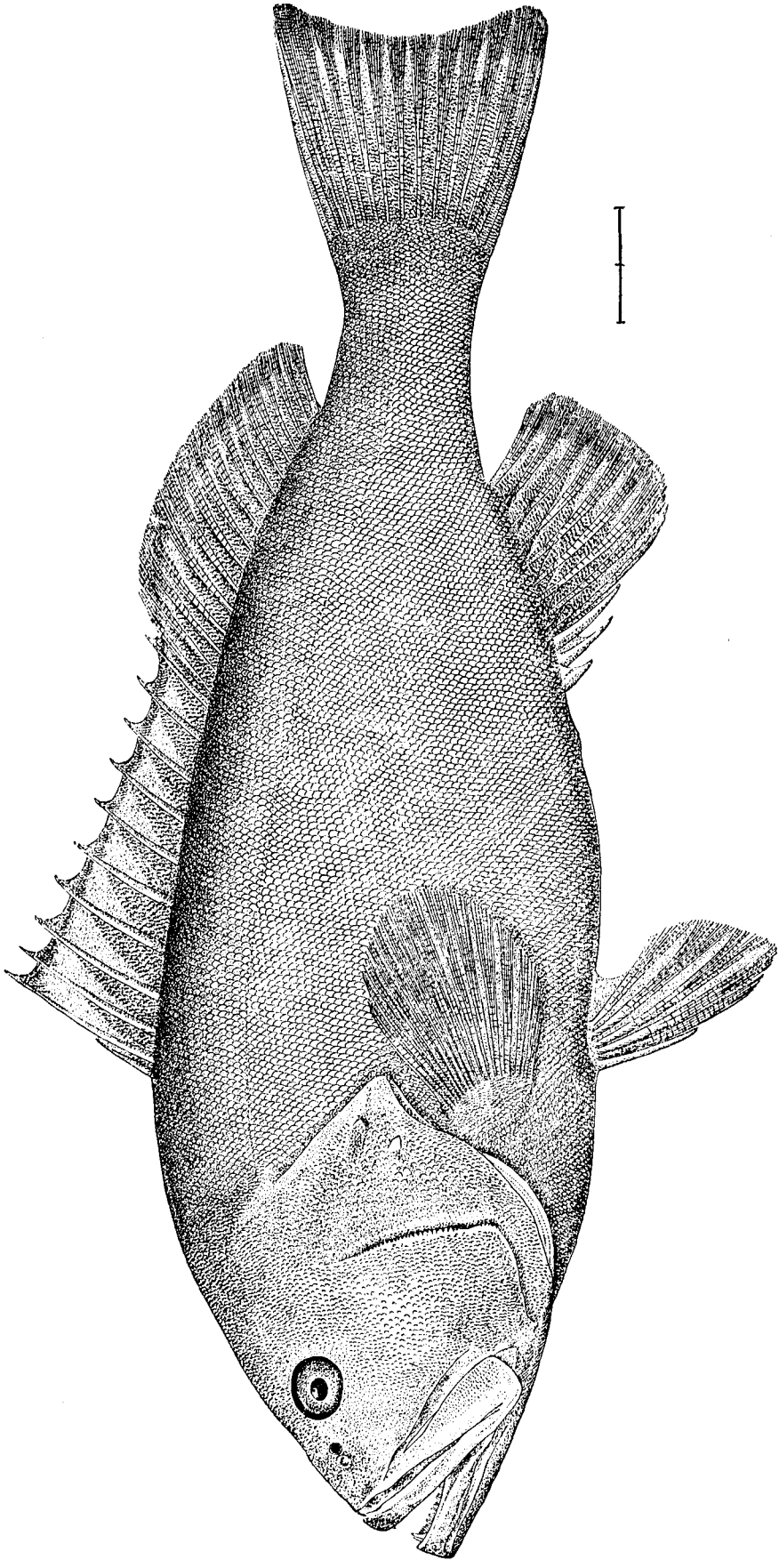
Schistorus mystacinus Poey, Repertorio, II, 154, 1868; Poey, Synopsis Pisc. Cubens., 1868, 287; Poey Enumeratio Pisc. Cubens., 1875, 18.

Epinephelus mystacinus Jordan & Swain, *l. c.*, 383 (Havana).

Habitat.—West Indian fauna.

Etymology.—μύσταξ, moustache.

This rather scarce species has been well described by Jordan & Swain.



EPINEPHELUS MORIO (Cuv. & Val.). The Red Grouper.
(No. 22129, U. S. National Museum; from Florida.)

37. EPINEPHELUS MORIO.

(RED GROUPER; CHERNA AMERICANA; CHERNA DE VIVERO.)

Serranus morio Cuv. & Val., Hist. Nat. Poiss., II, 285, 1828 ("New York" and San Domingo); Dekay, New York Fauna, Fishes, 1842, 23 (copied); Günther, I, 142, 1859 (Cuba); Steindachner, Ichth. Beitr., V, 127, 1876 (Rio Janeiro); Poey, Repertorio, I, 197.

Epinephelus morio Gill, Cat. Fish. E. Coast, 1861, 28 (name only); Poey, Syn. Pisc. Cub., 1868, 285 (Havana); Poey, Enum. Pisc. Cub., 15; Jordan & Gilbert, Proc. U. S. Nat. Mus., 1878, 379 (Beaufort, N. C.); Goode, *op. cit.*, 1879, 115 (St. John's River; Indian River); Goode & Bean, *op. cit.*, 1879, 139 (Pensacola); Bean, *op. cit.*, 1880, 99 (Bermuda); Poey, Anal. Hist. Nat., 319, 1881 (Puerto Rico); Goode & Bean, *op. cit.*, 1882, 238 (name only); Jordan & Gilbert, *op. cit.*, 1882, 272 (Pensacola); Poey, Bull. U. S. Fish Comm., 1885, 118 (Key West); Jordan & Gilbert, Syn. Fish. N. A., 1883, 510; Bean, Cat. Fishes Exhib. London, 60, 1883 (Key West, Fla.); Jordan, Proc. U. S. Nat. Mus., 1884, 124 (Key West); Jordan & Swain, Proc. U. S. Nat. Mus. 1884, 381, (description and synonymy).

Serranus erythrogaster Dekay, New York Fauna, Fishes, 1842, 21, tab. 19 (Florida); Storer, Synopsis, 1846, 30 (copied); Holbrook, Ichth. S. Carol., 1860, 29, pl. 5, fig. 2 (Charleston); Günther, I, 133 (copied).

Epinephelus erythrogaster Gill, Cat. Fishes East Coast U. S. 30, 1861 (name only).

Serranus remotus Poey, Memorias Cuba, II, 140, 1860 (Havana).

Habitat.—Atlantic coast of America, Virginia to Rio Janeiro.

Etymology.—*Morio*, (Moor), translation of the name *nègre* used at San Domingo.

Specimens of this species from Charleston, St. Thomas, Parà and Rio Janeiro are in the museum at Cambridge.

38. EPINEPHELUS NIGRITUS.

(BLACK JEW-FISH).

Serranus nigritus Holbrook, Ichth. S. Car., Ed. 1, 173, pl. xxv, f. 11, 1856 (Charleston); Günther, I, 1859, 134 (copied).

Epinephelus nigritus Gill, Cat. Fish. E. Coast U. S., 1861, 30 (name only); Goode & Bean, Proc. U. S. Nat. Mus., 1878, 182; Goode & Bean, *op. cit.*, 1879, 139 (Pensacola); Goode, *op. cit.*, 1879, 115 (Indian River, Florida); Jordan & Gilbert, Syn. Fish. N. A., 1883, 541 (copied); Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 380; Jordan, Proc. U. S. Nat. Mus., 1885, 208 (Pensacola); Bean, Proc. U. S. Nat. Mus., 1885, 231 (Pensacola).

Habitat.—South Atlantic and Gulf coast of United States, Charleston, Pensacola.

Etymology.—*Nigritus*, blackened.

This large Grouper, the largest in size of all our species of *Epinephelus*, is not uncommon off the coast of Florida. We have examined many specimens, large and small, since the publication of the memoir of Jordan and Swain, and the relations of the species may be considered as well established. This species reaches a weight of probably 500 pounds, about the same size as the largest known examples of *Promicrops guttatus* and *Stereolepis gigas*. None of the European species of *Epinephelus* reach so large a size, the extreme weight of *Epinephelus gigas* being, according to Doderlein, about 50 kilogrammes; that of *E. caninus* 90 kilogrammes.

We have proposed to consider this species and its near ally, *E. merus* as constituting a subgenus distinct from the other *Epinepheli* on account of the difference in the form of the upper portion of the skull. We have suggested for this group the Portuguese

name "*Garrupa*" (=Grouper), a name widely used in America for the larger Serranoid fishes.

The following notes are taken from the skull of a small example (about 18 inches long) from the beach of the Grand Lagoon at Pensacola:

COMPARISON OF THE SKULL OF EPINEPHELUS NIGRITUS WITH THAT OF E. MORIO.

In *E. morio* the skull is narrow and the upper surface rugose, the interorbital area is deeply concave, and the median crest, though low, is quite prominent; the occipital crest is sharp and drawn out so that it gradually merges into the interorbital ridge; the outline of the skull immediately behind the orbit is convex; the top of the temporal crest points inward to the occipital crest; the stay of the occipital crest forms a groove with the posterior part of the crest.

In *E. nigritus* the skull is very broad and flat, the interorbital area is little concave, and the median ridge is scarcely evident; the occipital crest disappears before reaching the interorbital region; the outline of the skull above is everywhere more or less flattened; the top of the temporal crest points outward; the stay of the occipital crest meets the crest at right angles and does not form a groove with it.

39. EPINEPHELUS MERUS.

(MERO DE LO ALTO.)

Centropristis merus Poey, Synopsis Piscuim Cubensium, 288, 1868 (Cuba).
Cerna sicana Doderlein, Rivista delle Specie del Genere *Epinephelus* o *Cerna*, 1882, 81 (Palermo).

Habitat.—West Indian fauna, taken off Cuba, Sicily, and Brazil.

Etymology.—Merus, from *mérou*, the French name of *Epinephelus gigas*, derived from Latin *morrhua*, cod-fish.

The brief description given by Poey of his *Centropristis merus* agrees with *Epinephelus nigritus* in all respects except the presence of but ten dorsal spines. The same may be said of the description given by Doderlein of a large *Epinephelus* recently taken in the waters about Palermo, to which he has hesitatingly given the name of *Serranus* or *Cerna sicana.**

I find in the Museum of Comparative Zoology two specimens (9737, 9788), each about 15 inches long, collected by Professor Agassiz at Rio de Janeiro, and a smaller one from Rio Grande do Sul. These specimens much resemble the *Epinephelus nigritus;* but all three agree in having, like the types of *merus* and *sicanus*, but ten dorsal spines, and, as in these species, the second dorsal spine is much elevated. There seems to be little room for doubt that all these specimens belong to one species, hitherto imperfectly known. This species should then retain the oldest specific name *Epinephelus merus.*

The following description is taken from 9737, M. C. Z.:

Body very deep and short, deeper and more compressed than in any other of our species of *Epinephelus.* Head large and blunt, the anterior profile regularly convex; interorbital area broad, as in *E. nigritus*, rather convex; eye small; mouth very large, the lower jaw projecting; supplementary maxillary small. Teeth, as usual in *Epinephelus*, in very broad bands; three or four very small canines in front of each jaw; no

*NOTE.—È questione d' altronde se i suddetti caratteri possono dar luogo ad istituire una specie novella, o se sieno effetto di una semplice anomalia di forma delle preacennate due specie (*caninus, cernioides*). Io non oso pronunciarmi in proposito; ed unicamente in via provvisoria e per indicarne la specialità, mi faccio coraggio di denominarla *Serranus* o *Cerna sicana*, in allusione al luogo ove fu presa."

lateral canines. Nostrils round, near together, the posterior largest. Preopercle without salient angle, but rather coarsely serrate; two or three very coarse, irregular teeth just below angle, these turned downward much as in *Epinephelus mystacinus*. Opercular spine moderate.

Gill-rakers very short and thick, x + 12, the longest not twice as high as broad and all very coarsely toothed; preorbital moderate, nearly as broad as the small eye.

Scales moderate, not very rough; dorsal fin rather deeply notched, the second spine highest, nearly three times the height of the first, but little higher than the third; soft dorsal high; caudal rounded; anal fin high, rounded, the spines moderate, graduated; pectorals short.

Color, in spirits, plain dark brown; fins all darker; a dark mustache along the edge of the maxillary. In the young specimen the caudal fin is abruptly paler. Head $2\frac{3}{5}$ in length of body; depth $2\frac{3}{5}$. D. X, 14; A. III, 9. Scales 86 (series). Second dorsal spine $2\frac{3}{5}$ in head; second anal spine 6. Pectoral $1\frac{4}{5}$; maxillary 2; eye 7; snout, $3\frac{2}{3}$; interorbital area, $4\frac{1}{2}$; soft dorsal rays $2\frac{2}{3}$ in head.

Since writing the above we have examined a specimen of *Epinephelus nigritus* from Pensacola which possesses but ten dorsal spines. We are unable to distinguish it from *E. merus*. If the number of dorsal spines prove to be constantly ten in Brazilian or European specimens this character may distinguish *E. merus* or *sicanus* as a distinct species or subspecies. It would appear that the number eleven is not constant in northern specimens, as one of about ten examined has ten spines.

Genus X.—PROMICROPS.

Promicrops (Gill MSS.) Poey, Synopsis Piscium Cubensium, 287, 1868 (*guasa*).
Itaiara Vaillant & Bocourt, Mission Scientifique au Mexique, 1875, 90 (*itaiara*).

TYPE.—*Serranus guasa* Poey = *Perca guttata* Linnæus.

Etymology.—*Πρό*, before; *μικρός*, small; *ὤφ*, eye, in allusion to the shortness of the anterior part of the cranium.

A full account of the single known species of this genus is given by Jordan and Swain in the paper already quoted.

ANALYSIS OF SPECIES OF PROMICROPS.

a. Color olivaceous with darker cross-shades, which fade with age; head and body with round black spots; second anal spine as long as third; profile slightly concave above eye; interorbital area flattish, very broad, its width 5 in head; canine teeth very small; dorsal spines low and strong; the third, fourth, and fifth subequal, about 4 in head; scales moderate (about 95). GUTTATUS, 40.

40. PROMICROPS GUTTATUS.

(GUASA; JEW-FISH; MEROU; JACOB EVERTZEN.)

Cugupuguacu Marcgrave, Hist. Brazil, etc., 1648, 169 (Brazil); Willoughby, Hist. Pisc., 1686, 303, with plate (after Marcgrave).

Itaiara Marcgrave, Hist. Brazil, etc., 1648 (Brazil).

Perca guttata Linnæus, Syst. Nat., 1758, X, 292 (after Marcgrave, Willoughby, etc., excl. syn. Catesby).

Serranus itaiara Lichtenstein, Acta Berolin., 1820–'21, 278 (Brazil); Cuvier and Valenciennes, II, 1828, 376 (Brazil); Peters, Berliner Monatsber., 1865, 110 (identification with *S. galeus* M. & H.); Steindachner, Ichth. Beitr., V, 127, 1876.

Serranus (*Itaiara*) *itaiara* Vaillant and Bocourt, Miss. Sci. au Mexique., 1875, 90, pl. ii, f. 4 (identification with *S. quinquefasciatus* (Brazil; Tauesco; Mexico).

Epinephelus itaiara Jordan, Proc. U. S. Nat. Mus., 1884, 124 (Key West).
Promicrops itaiara Jordan and Swain, *op. cit.*, 1884, 877 (Key West; Havana; Mazatlan; Panama; Punta Arenas).
Serranus galeus Müller and Troschel, Schomburgk's Reise in Brit. Guiana, 621, about 1842; Günther, I, 1859, 130 (Brazil).
Epinephelus galeus Jordan, Proc. Ac. Nat. Sci. Phila., 1883, 285 (identification of type of *Serranus galeus*).
Serranus guasa Poey, Memorias Cuba, II, 1860, 141, 354, tab. 13, f. 8 (Cuba).
Promicrops guasa Poey, Rep., II, 154, 1867; Poey, Synopsis Pisc. Cub., 287, 1868; Poey, Enum. Pisc. Cubens., 1875, 18; Poey, Bull. U. S. Fish Comm., 1882, 118 (Key West); Jordan and Gilbert, Syn. Fishes N. A., 1883, 542 (copied); Gill, Rep. U. S. Fish Comm., 1871-'72, 806 (name only).
Epinephelus guasa Goode and Bean, Proc. U. S. Nat. Mus., 1882, 238 (name only).
Serranus quinquefasciatus Bocourt, Ann. Sci. Nat., 1868, 223 (Nagualate, Pacific coast of Guatemala).
Epinephelus quinquefasciatus Jordan and Gilbert, Bull. U. S. Fish Comm., 1882, 106, 110, 112 (Mazatlan; Panama; Punta Arenas; no descr.).

Habitat.—Both coasts of tropical America north to Florida and Gulf of California, south to Brazil.

Etymology.—*Guttatus*, spotted.

We have adopted the specific name *guttatus* for this species, because we feel sure that it is the real type of the Linnæan *Perca guttuta*. In the paper of Jordan and Swain it is supposed that the *Cugupuguacu* of Willoughby may be the *Bodianus cruentatus*, and that the latter species is concerned with *Epinephelus catus* in forming the Linnæan type. We have since examined Willoughby's work. His description is a copy of Marcgrave's, and his figure represents the *Promicrops* which is the subject of Marcgrave's description, and nothing else.

Linnæus's *Perca guttata* is based, then, on Marcgrave's fish, and on the reprints of Marcgrave's description given by Willoughby, Ray, and Sloane, and on the Hind of Catesby (*Epinephelus catus*), which both Catesby and Linnæus wrongly supposed to be Marcgrave's species. The name *guttatus* can not go with the *Bodianus*, because that species was not known to any of the writers before Linnæus. It must go with Marcgrave's *Cugupuguacu*, which is the base of all the pre-Linnæan descriptions except that of Catesby. From Catesby's figure Linnæus must have taken the phrase in his diagnosis "corpore punctis sanguineis adsperso." Otherwise the *Perca guttata* rests entirely on Marcgrave's "Cugupuguacu," which is unquestionably our *Promicrops*.

The three species of which the synonymy has been thus entangled should, in our opinion, stand as *Epinephelus catus*, *Promicrops guttatus*, and *Bodianus cruentatus*.

Specimens of this huge Serranoid are in the Museum at Cambridge from Rio de Janeiro, Bahia, Pernambuco, and Cannarivieras.

Genus XI.—MYCTEROPERCA.

Mycteroperca Gill, Proc. Ac. Nat. Sci. Phil., 80, 1863 (*olfax*).
Triostropis Gill, Proc. Ac. Nat. Sci. Phil., 104, 1865 (*guttatus=venenosus*).
Parepinephelus Bleeker, Systema Percarum Revisum, 257, 1875 (*acutirostris*).

TYPE.—*Serranus olfax* Jenyns.

Etymology.—*Μυκτήρ*, nostril; *πέρκη*, perch.

A few changes are made in the arrangement of the species of this genus as given by Jordan and Swain. Three species, *M. olfax*, *M. calliura*, and *M. dimidiata*, have been examined by us, and can be more correctly defined than was possible when the former paper was written. Two new species, *M. xenarcha* and *M. jordani*, have been

PROMICROPS GUTTATUS (Linnæus). The Guasa or Jew-fish.

(No. 22306, U. S. National Museum; from St. John's River, Florida.)

added to the group, while another, *M. reticulata*, has been eliminated, this species being identical with *M. tigris*. The name *rubra* takes the place of *scirenga*, and that of *apua* supersedes *guttata* for the red variety of *M. venenosa*. We have found it convenient to divide the group on the character of the nostrils, a basis of division more natural than that adopted in our former paper.

Professor Peters (Berliner Monatsberichte, 1865, 107) gives a detailed account of the specimen which was the original type of *Epinephelus ruber*. This *Epinephelus ruber* is a *Mycteroperca*, as is shown by the number of fin rays (D. XI, 16; A. III, 11), by the projecting lower jaw, the pointed snout, and by the general resemblance in form of body, fins, head, and teeth which the species is said to show to *Mycteroperca acutirostris*. As elsewhere stated, there is little doubt of the identity of *ruber* and *acutirostris*.

ANALYSIS OF SPECIES OF MYCTEROPERCA.

a. Nostrils very close together, the posterior decidedly larger than the anterior (*Mycteroperca*).

b. Second dorsal spine highest, its length more than one-third that of head; third spine scarcely shorter; caudal slightly lunate; canine teeth moderate; angle of preopercle not salient; anal fin angulated, its longest rays about 2½ in head, its posterior margin concave; gill-rakers coarse and long, x + 15; scales small (13-20-x). Color brown, with grayish reticulations around brown spots; fins dusky edged; specimens from deep water (var. *ruberrima*) chiefly red. OLFAX, 41.

bb. Second dorsal spine low, shorter than third, the third and fourth highest.

c. Margin of anal fin posteriorly concave, its middle rays much exserted.

d. Outer rays of caudal scarcely produced, not two-thirds length of head; canine teeth moderate; angle of preopercle little salient; scales small (lat. l. about 130); color plain red; vertical fins without black edgings; gill-rakers long, x + 17. ROSACEA, 42.

dd. Outer rays of caudal much produced, more than two-thirds length of head; preopercle with salient angle; canine teeth strong; scales small (lat. l. 140); gill-rakers about 4 + 20. Color brownish with small darker spots; vertical fins broadly edged with blackish ..... FALCATA, 43.

x. Upper canines directed strongly forward, the lower backward; coloration obscure. var. *falcata*

xx. Upper canines nearly vertical; coloration paler and brighter ..... var. *phenax*.

cc. Margin of anal fin not concave posteriorly, the outline of the fin rounded or slightly angular.

e. Gill-rakers rather few, x + 12; body without dark cross-bars, covered with grayish reticulations around small brown spots, these not evident on head; anal fin rounded; preopercle with a salient angle; caudal deeply lunate; scales moderate (lat. l. 90 to 100) form rather robust; anal fin not angulate ..... CALLIURA, 44.

ee. Gill-rakers very few, short, and thick, about x + 6; body with light and dark cross-bars, these often becoming obsolete with age; head usually with distinct reticulations around yellowish spots; anal fin with angular margin, subtruncate posteriorly; preopercle without salient angle; scales rather small (lat. l. 133); form rather robust ..... TIGRIS, 45.

x. Ground color dark olive ..... var. *tigris*.

xx. Ground color bright red ..... var. *camelopardalis*.

aa. Nostrils small, subequal, well separated.

c. Gill-rakers in moderate or small numbers, from 8 to 18 on lower part of anterior arch (*Trisotropis* Gill).

d. Anal fin not angulated, its outline more or less evenly rounded; soft parts of vertical fins edged with black in life.

e. Angle of preopercle not salient, its teeth scarcely enlarged; gill-rakers x + 8 to 10.

f. Gill-rakers very few and short, x + 8 developed (besides some rudiments) General color pale, bright red, or grayish, with roundish spots or blotches of black or red darker than the ground color; the blacker blotches along middle of sides much larger and quadrate in the young; red always present somewhere in life (fading in spirits); pectorals blackish, in the adult broadly tipped with orange-yellow; scales rather small (about 125); caudal lunate.

VENENOSA, 46.

y. General color gray, with red and black markings ..... var. *venenosa.*

yy. General color scarlet, with red and black markings ..... var. *apua.*

ff. Gill-rakers rather slender, about x+10 (besides several rudiments); caudal subtruncate; nostrils small.

g. Scales not very small (about 110)); color dark olive-green, sides of head and body with rivulations of dark bluish around roundish dark bronze spots, large or small (these markings subject to considerable variation, fading in spirits); sides with darker quadrate areas ..... BONACI, 47.

z. Dark blotches on body rather large, often quadrate ..... var. *bonaci.*

zz. Dark spots on body very small, close set of a deep bronze-orange.

var. *xanthosticta.*

gg. Scales very small (30 to 140); angle of preopercle not salient, but the teeth at the angle somewhat larger; general form, appearance, and color of *E. bonaci.* Color olive-green; head with numerous dark green streaks radiating from eye; a dark mustache along maxillary; body with small, irregular, dark, quadrate blotches; fins, except pectorals, mostly dusky ..... JORDANI, 48.

ee. Angle of preopercle more or less salient, its teeth somewhat enlarged; gill-rakers more numerous, x + 12 to 14.

h. Scales very small (about 140); caudal peduncle without black spot; interorbital area scarcely concave; cheeks without distinct dusky stripes; commissure without yellow; caudal distinctly lunate; gill-rakers few, about 12 on lower part of anterior arch ..... MICROLEPIS, 49.

hh. Scales rather small (about 120); interorbital area channeled; angle of preopercle little salient; body slender; caudal little concave; sides with small, faint spots of darker; commissure with yellow-green ..... INTERSTITIALIS, 50.

ggg. Scales not very small (about 110); upper part of body dark brown, the lower half abruptly paler; a pale ring around caudal peduncle, behind which is a squarish dark blotch, smaller than eye, at base of upper rays of caudal; caudal deeply lunate; teeth strong ..... DIMIDIATA, 51.

dd. Anal fin angulated, its middle rays much exserted, its posterior margin concave; body rather robust; scales moderate (about 110); caudal fin subtruncate; gill-rakers about x + 18; angle of preopercle slightly salient, with coarser teeth; seventh ray of anal nearly half head; tenth ray of dorsal somewhat produced; color nearly plain dark olivaceous, the edges of the fins scarcely darker.

XENARCHA, 52.

cc. Gill-rakers very long and slender, in greatly increased number (x + 25 to 35). (*Parepinephelus* Bleeker.)

h. Caudal fin lunate, its angles more or less produced in the adult, the fin subtruncate in the young; anal fin more or less angulate in the adult, rounded in the young; soft dorsal somewhat angular; scales rather large (lat. l., 95); body rather deep, the snout sharp; preopercle with a salient angle which is armed with larger teeth; dorsal spines low; gill-rakers close set, x + 30, the longest 7½ in head; ventrals not reaching to vent; color olive-gray with darker reticulations around pale spots; fins not much darker on their edges; a dark mustache along the maxillary; adult examples nearly uniform brown.

RUBRA, 53.

41. MYCTEROPERCA OLFAX.

(YELLOW GROUPER.)

a. Green variety (*olfax*).

Serranus olfax Jenyns, Zoöl. of the Beagle, Fishes, 9, pl. 4, 1840 (Galapagos Islands); Günther, Proc. Zool. Soc. London, 1877, 67.

Mycteroperca olfax Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 376 (copied); Jordan, Proc. U. S. Nat. Mus., 1884 (Abingdon Island, Galapagos; Panama).

b. Red variety (*ruberrima*).

Mycteroperca olfax ruberrima Jordan & Bollman, var. nov. (Abingdon Island).

Habitat.—Galapagos Islands; Panama.

Etymology.—*Olfacto*, to smell, from the large size of the nostrils.

This species is well represented in the museum at Cambridge, some of the specimens there being 2 feet in length. The following description is taken from No. 24198, M. C. Z., 2 feet long, from James Island, Galapagos:

Head $2\frac{2}{10}$ to 3 in length; depth, $3\frac{1}{3}$. D., XI, 17; A., III, 11. Scales, 30–120–x.

Body robust, not strongly compressed; head deep, the snout rather sharp, the anterior profile steep; mouth large, the maxillary reaching somewhat beyond eye, $2\frac{1}{6}$ in head, its surface scaly, as in other species; teeth moderate; canines normal; nostrils large, very close together, separated by a narrow vertical septum, the posterior some three times the diameter of the anterior, which is broader than the septum (in the dried example examined by Jenyns the anterior nostril seems to have been overlooked, and a horizontal basal membrane in the posterior nostril was taken for the nasal septum); eye small, 7 in head; preorbital as broad as eye; interorbital area flattish and broad, $4\frac{2}{3}$ in head; gill-rakers coarse and long, x+15; preopercle without salient angle, its notch moderate; scales small, chiefly cycloid.

Dorsal spine strong, the second and third elevated so that the posterior outline of the fin is concave, first spine just half the second, second and third equal, $2\frac{2}{3}$ in head, fourth $1\frac{1}{2}$ in third; soft dorsal scarcely angular; caudal fin shallow-lunate; soft anal falcate, its posterior margin concave, the longest rays $2\frac{1}{3}$ in head (its form as in the adult of *rosacea*, *falcata*, *xenarcha*, and *rubra*).

Color brown, with some traces of grayish vermiculations around small round brown spots; fins all dusky, especially distally.

Young covered all over with round brown spots, much smaller than the pupil; a black mustache; pectoral with a narrow pale edge.

A large specimen taken by the *Albatross* at Abingdon Island, in the Galapagos, seems to have been bright red in life. It probably represents a deep-water variety analagous to the red varieties of West Indian species. It may be distinguished as var. *ruberrima*. The anal is a little lower than in an equally large specimen of the typical *olfax* taken in the same locality. No other difference is apparent.

42. MYCTEROPERCA ROSACEA.

Epinephelus rosaceus Streets, Bull. U. S. Nat. Mus., VII, 1877, 51 (Angel Island, Gulf of California).
Trisotropis rosaceus Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 107 (Mazatlan).
Mycteroperca rosacea Jordan & Swain, *op. cit.*, 362, 1884 (Mazatlan).

Habitat.—Gulf of California.
Etymology.—*Rosaceus*, rosy.

Only two specimens of this species are yet known; one of these has been described in detail by Jordan & Swain, the other by Dr. Streets.

43. MYCTEROPERCA FALCATA.

(SCAMP; BACALAO; ABADEJO.)

a. Var. *falcata.*

Serranus falcatus Poey, Memorias de Cuba, II, 138, 1860 (Havana).
Trisotropis falcatus Poey, Synopsis Pisc. Cubens., 285, 1868 (Havana); Poey, Ann. Lyc. Nat. Hist. N. Y., 309, 1869 (Havana); Poey, Enum. Pisc. Cubens., 15, 1875 (Havana).
Mycteroperca falcata Jordan & Swain *op. cit.*, 1884, 362 (Havana).

b. Var. *phenax.*

Trisotropis falcatus Goode & Bean, Proc. U. S. Nat. Mus., 140, 1879 (Pensacola, Fla.); Poey, Bull. U. S. Fish Comm., II, 118, 1882 (Key West, Fla.); Jordan & Gilbert, Proc. U. S. Nat. Mus., 273, 1882 (Pensacola, Fla.); Jordan & Gilbert, Synopsis Fishes North America, 538, 1883 (copied from Goode & Bean).
Epinephelus falcatus Jordan, Proc. U. S. Nat. Mus., 1884, 124 (Key West).
Mycteroperca falcata phenax Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 363 (Key West).

Habitat.—West Indian fauna, Pensacola to Cuba.
Etymology.—*Falcatus*, scythe-shaped.

As we have found that *Mycteroperca rubra* (*acutirostris*) has often or usually the anal fin angulated, as in the present species, it is probable that Dr. Steindachner was correct in referring his specimens showing this character from Messina and Rio Janeiro to *M. rubra* (*acutirostris*) rather than to *M. falcata.* (See Steindachner, Ichth. Beitr., XII, 3, 1882, and Jordan & Swain, *l. c.*)

We have specimens of this species from Cuba and from Bahia, the variety *phenax* from Pensacola and Key West.

44. MYCTEROPERCA CALLIURA.

Mycteroperca calliura Poey, Repertorio, 1867, I, 181, 309 (Cuba); Ann. Lyc. Nat. Hist. N. Y., IX, 307, 1869; Poey, Enum. Pisc. Cubens., 14, 1875.
Trisotropis calliurus Poey, Syn. Pis. Cubens., 284, 1868 (Cuba); Jordan & Swain, *op. cit.*, 366 (copied).

Habitat.—West Indian fauna, Cuba.
Etymology.—*Κάλλος*, beauty; *οὐρα*, tail.

A specimen in the museum at Cambridge (10011, 14 inches long), sent by Poey from Havana, is apparently typical of this species.

Body rather deep and compressed; preopercle with salient angle; gill-rakers x+12; nostrils as in *M. tigris*, *olfax*, etc., the posterior considerably the larger, the two close together, and the large nostril with a sort of interior septum at its base

crossing it horizontally. Head 3 in length; depth 3. D. XI, 16; A. III, 11. Snout $4\frac{2}{3}$ in head; eye 5; scales about 90 to 100; color brownish, everywhere with grayish reticulations around small brown spots, these not larger than pupil and not evident on the head; fins all edged with dusky.

45. MYCTEROPERCA TIGRIS.

(BONACI GATO.)

a. Var. *tigris* (brown variety).

Serranus tigris Cuv. & Val., IX, 440, 1833 (San Domingo); Günther, I, 112 (copied).
Trisotropis tigris Poey, Ann. Lyc. Nat. Hist. N. Y., 1869, 307 (Havana); Poey, Enum. Pisc. Cubens., 1875, 14.
Mycteroperca tigris Jordan & Swain, *op. cit.*, 364 (Havana).
Serranus felinus Poey, Memorias de Cuba, II, 134, 1860 (Havana).
Serranus repandus Poey, Memorias de Cuba, II, 135, 1860 (Havana).
Trisotropis reticulatus Gill, Proc. Ac. Nat. Sci., 1865, 105 (Barbadoes).
Mycteroperca reticulata Jordan & Swain, *l. c.*, 373 (Barbadoes).

b. Var. *camelopardalis* (red variety).

Serranus camelopardalis Poey, Mem. Cuba, II, 132, 1860 (Havana).
Trisotropis camelopardalis Poey, Syn. Pisc. Cub., 283, 1868; Poey, Ann. Lyc. Nat. Hist. N. Y., 307, 1869; Poey, Enum. Pisc. Cub., 1875, 14.
Serranus rivulatus Poey, Memorias Cuba, II, 1860, 135 (Havana).

Habitat.—West Indian fauna.
Etymology.—*Tigris*, tiger.

Several specimens in the museum at Cambridge, sent from Havana by Poey, agree perfectly with the type of *Trisotropis reticulatus*. These prove, on closer study, to be specimens of the *M. tigris*, from which the dark cross-bands have faded. There seems no reason whatever for doubting the identity of *E. reticulatus* with *E. tigris*.

A specimen of this species is in the museum at Cambridge from Maranhão. Another from Cuba is labeled as the type of *Serranus felinus* Poey.

46. MYCTEROPERCA VENENOSA.

(ROCK-FISH; BONACI CARDENAL; YELLOW-FINNED GROUPER; BONACI DE PIEDRA.)

a. Var. *venenosa* (gray variety).

Perca marina venenosa, the Rock-fish, Catesby, Fishes Carolina, etc., tab. 5 (Bahamas).
Perca venenosa Linnæus, Syst. Nat., x, 292, 1758 (after Catesby); *ibid.*, XII, 486; Gmelin, Syst. Nat., 1788, 1318, (copied); Bloch & Schneider, Syst. Ichth., 1801, 92 (copied).
Mycteroperca venenosa Jordan & Swain, *l. c.*, 373 (Key West; Havana).
Epinephelus venenosus Jordan, Proc. U. S. Nat. Mus., 1884, 124 (Key West).
Serranus petrosus Poey, Memorias Cuba, II, 136, 1860 (Havana); Poey, Repertorio, II, 165, 1868.
Trisotropis petrosus Poey, Ann. Lyc. Nat. Hist. N. Y., 1869, 304; Poey, Enum. Pisc. Cubens., 1875, 13; Poey, Bull. U. S. Fish Comm., 1882, 118 (Key West); Jordan & Gilbert, Syn. Fish. N. A., 1883, 918 (copied).
Trisotropis undulosus Goode, Bull. U. S. Nat. Mus., V, 55, 1876 (Bermudas; excl. syn.).

b. Var. *apua* (red variety).

Pirati apia Marcgrave, Hist. Bras., 158, 1648 (Brazil).
Bodianus apua Bloch, Ichth., VII, 37, Taf. 229, 1790 (Brazil, after a drawing by Prince Maurice—the same used by Marcgrave).
Bonaci cardenal Parra, Piezas de Hist. Nat. Cuba, 29, lam. XVI, 1787 (Havana).
Johnius guttatus Bloch & Schneider, Syst. Ichthyol., 77, 1801 (after Parra).
Bodianus marginatus Bloch & Schneider, *l. c.*, 331 (after Marcgrave).
Serranus cardinalis Cuv. & Val., Hist. Nat. Poiss., II, 378, 1828; Poey, Repertorio, II, 200, 1867 (after Parra).
Trisotropis cardinalis Poey, Ann. Lyc. Nat. Hist. N. Y., 1869, 303 (Cuba); Poey, Enum. Pisc. Cubens., 1875, 13.
Serranus rupestris Cuv. & Val., Hist. Nat. Poiss., IX, 437, 1833; Günther, Cat. Fish. Brit. Mus., I, 145, 1859 (San Domingo).
Mycteroperca venenosa guttata Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 375 (Havana).

Habitat.—West Indies, Florida Keys, and southward.
Etymology.—*Venenosus*, venomous, the flesh being sometimes poisonous.

We now adopt the name *apua* for the red variety of this species instead of *guttatus*. The *Bodianus apua* of Bloch could have been intended for nothing else than the *Bonaci cardenal*, although the figure is a very incorrect one.

Specimens of the red variety *apua*, from the Florida Keys, are in the museum at Cambridge. Others were obtained by the *Albatross* at St. Lucia.

47. MYCTEROPERCA BONACI.

(BONACI ARARÁ; BLACK GROUPER.)

a. Var. *bonaci.*

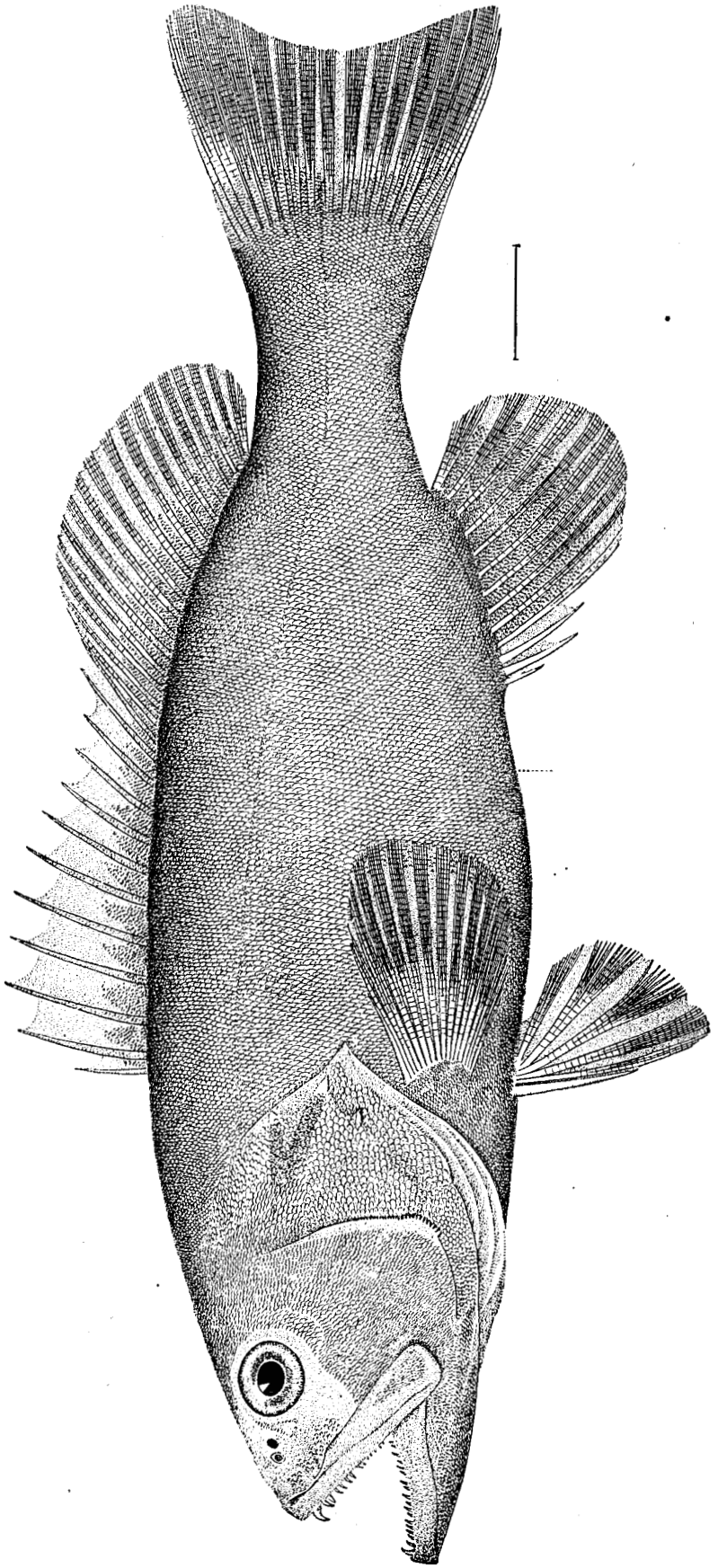
Bonaci arara Parra, Piezas de Hist, Nat. Cuba, 1787, tab. 16, f. 2 (Havana).
? Serranus bonaci Poey, Memorias de Cuba, 1860, II, 129 (Cuba).
Trisotropis bonaci Poey, Syn. Pisc. Cubens., 1868, 283; Poey, Ann. Lyc. Nat. Hist. N. Y., 306, 1869; Poey, Enum. Pisc. Cubens., 1875, 13.
Epinephelus bonaci Jordan, Proc. U. S. Nat. Mus., 1884, 124 (Key West).
Mycteroperca bonaci Jordan & Swain, l. c., 1884, 370 (Key West, Havana).
Serranus brunneus Poey, Mem. Cuba, 1860, II, 131; Poey, Repertorio Fis. Nat., II, 156, 1868.
Trisotropis brunneus Poey, Syn. Pisc. Cub., 1868, 284; Poey, Ann. Lyc. Nat. Hist. N. Y., 305, 1869; Poey, Enum. Pisc. Cubens., 1875, 13; Poey, Bull. U. S. Fish Comm., 118, 1882 (Key West); Jordan & Gilbert, Syn. Fish. N. A., 1883, 538 (copied).
Serranus arará Poey, Memorias Cuba, II, 1860, 132 (Cuba; not of Cuv. & Val.); Steindachner, Ichthyol. Notizen, 1867, VI, 42.
Serranus decimalis Poey, Memorias Cuba, II, 1860, 138 (Cuba).
Serranus cyclopomatus Poey, Mem. Cuba, II, 1860, 353 (Cuba).
Serranus latepictus Poey, Mem. Cuba, II, 1860, 353 (Cuba).
Trisotropis aguaji Poey, Repertorio, II, 229, 1868; Poey, Synopsis, 1868, 284; Poey, Ann. Lyc. Nat. Hist. N. Y., IX, 306; Poey, Enumeratio, 14.

b. Var. *xanthosticta.*

Mycteroperca bonaci xanthosticta Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 371 (Pensacola).

Habitat.—West Indies, Pensacola to Brazil.
Etymology.—*Bonaci*, the Cuban name for the species.

Specimens of this species are in the museum at Cambridge, from Cuba, Nassau, and Rio Janeiro.



MYCTEROPERCA MICROLEPIS (Goode & Bean). The Gag.
(No. 5137, U. S. National Museum; from Pensacola, Florida.)

We still feel a little doubt as to whether this is the original *bonaci* of Poey. If it should prove to be not that species, the present species should stand as *Mycteroperca decimalis*.

48. MYCTEROPERCA JORDANI.

Epinephelus jordani Jenkins & Evermann, Proc. U. S. Nat. Mus., 1888 (Guaymas).

Habitat.—Gulf of California.
Etymology.—Named for David Starr Jordan.

This species is very close to *M. bonaci*, from which it differs chiefly in the smaller scales. It is known from several young examples, the largest something more than a foot long, collected by Professors Evermann and Jenkins in the Gulf of California.

49. MYCTEROPERCA MICROLEPIS.

(GAG; AGUAJI.)

Serranus acutirostris Cuvier & Valenciennes, Hist. Nat. Poiss., IX, 432 (Charleston: no descr.; not type); Dekay, New York Fauna, Fishes, 1842, 23 (Charleston).
Trisotropis acutirostris Gill, Rept. U. S. Fish Comm., 1871–'72, 806 (name only).
Trisotropis brunneus Goode & Bean, Proc. U. S. Nat. Mus., 1879, 115, 143 (Pensacola; not of Poey).
Trisotropis microlepis Goode & Bean, Proc. U. S. Nat. Mus., 1879, 141 (West Florida); Goode & Bean, Proc. U. S. Nat. Mus., 1882, 238 (no descr.); Jordan & Gilbert, Syn. Fish. N. A., 1883, 538 (copied).
Epinephelus microlepis Jordan, Proc. U. S. Nat. Mus., 1884, 124 (Key West; Cedar Keys).
Mycteroperca microlepis Jordan & Swain, *op. cit.*, 367 (Key West; Pensacola; Cedar Keys); Jordan, Proc. U. S. Nat. Mus., 1886, 27 (Beaufort, N. C.).
Trisotropis stomias (Goode & Bean, MSS.), Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 273 (Pensacola); Goode & Bean, Proc. U. S. Nat. Mus., 1882, 427 (Pensacola; Key West); Jordan & Gilbert, Syn. Fish. N. A., 918, 971; Bean, Cat. Fishes Exhib. London, 1883, 61 (Pensacola).

Habitat.—South Atlantic and Gulf coast of United States, north to Beaufort, N. C.
Etymology.—*Μικρός*, small; *λεπίς*, scale.

Thus far this species, common on the coasts of Carolina and Florida, has not been taken in the West Indies. It is however frequently seen in the Havana markets (from Key West) and some one of Poey's nominal species may have been based on it. A specimen of this species from Mobile is in the museum at Cambridge.

50. MYCTEROPERCA INTERSTITIALIS.

? *Serranus interstitialis* Poey, Memorias, II, 127, 1860 (Cuba).
? *Trisotropis interstitialis* Poey, Synopsis Pisc. Cubens., 1868, 285; Poey, Ann. Lyc. Nat. Hist. N. Y., 308, 1869; Poey, Enum. Pisc. Cubens., 14, 1875.
Mycteroperca interstitialis Jordan & Swain, *l. c.*, 365 (Havana).
? *Trisotropis chlorostomus* Poey, Repertorio, II, 231, 1868; Poey, Synopsis Pisc. Cubens., 285, 1868; Poey, Ann. Lyc. Nat. Hist. N. Y., 308, 1869 (Cuba).

Habitat.—West Indian fauna, Cuba.
Etymology.—*Interstitialis*, having interstices.

We have some doubt as to whether the Havana specimens described by Jordan and Swain are identical with either the *interstitialis* or the *chlorostomus* of Poey. We

know of no better identification, however, and in this case nothing will be gained by the exchange of one doubtful opinion for another. This is certainly a distinct species and it must have been known to Poey.

51. MYCTEROPERCA DIMIDIATA.

Serranus dimidiatus Poey, Memorias Cuba, 1860, II, 129 (Cuba).
Trisotropis dimidiatus Poey, Syn. Pisc. Cubens., 1868, 285; Poey, Ann. Lyc. Nat. Hist. N. Y., 1869, 308; Poey, Enum. Pisc. Cubens., 1875, 14, II, 129, 1860 (Cuba).
Mycteroperca dimidiata Jordan & Swain, *l. c.*, 367 (copied).

Habitat.—West Indian fauna, Cuba.

Etymology.—*Dimidiatus*, halved, upper half of body differing in coloration from lower.

We find a small specimen of this species (26953, M. C. Z., 8 inches long) in the museum at Cambridge. It was sent from Havana by Professor Poey, and it is probably one of his types.

Body rather deep and compressed; mouth small, lower jaw projecting; canines strong, as in *M. falcata*; snout rather sharp, 4 in head; maxillary 2; eye 5; nostrils small, not far apart, the anterior rather the larger; angle of preopercle salient, armed with stronger teeth; gill-rakers rather slender, x + 14. Scales rather small, about 110; caudal fin rather deeply lunate; anal fin rounded.

Head 3 in length; depth 3. D. XI, 16; A. III, 11.

Color, in spirits, quite dark above, the lower half abruptly paler; a narrow pale ring around caudal peduncle, behind which is a squarish dark blotch, smaller than eye, at base of upper rays of caudal; a dark area from tip of lower jaw through eye to the boundary between the dark and pale on the sides. Caudal, soft dorsal, ventrals, and anal edged with black.

52. MYCTEROPERCA XENARCHA.

Mycteroperca xenarcha Jordan, Proc. Ac. Nat. Sci. Phila., 1887 (Galapagos Islands; Payta).

Habitat.—Galapagos Archipelago; Coast of Peru.

Etymology.—*Ξενός*, strange; *ἀρχός*, anus.

This species is known from numerous specimens in the Museum of Comparative Zoology at Cambridge, from the Galapagos Islands and from Payta, Peru.

53. MYCTEROPERCA RUBRA.

Epinephelus ruber Bloch, Ichthyologia, VII, 22, 1793, Tafel 330 ("Japan" (?)); Bloch & Schneider, Systema Ichthyol., 1801, 299 (copied).
Serranus ruber Peters, Berliner Monatsberichte, 1865, 107 (re-description of original type).
?? *Sparus scirenga* Rafinesque, Caratteri di alcuni Nuovi Generi etc., 50, 1810 (Palermo; as likely to be *Epinephelus alexandrinus*).
Mycteroperca scirenga Jordan & Swain, *l. c.*, 369 (copied).
Serranus acutirostris Cuv. & Val., II, 286, 1828 (Brazil); Valenciennes, "Ichthyologie des Îles Canaries, pl. iii, f. 1" (Canary Islands; Messina); Guichenot, Explor. Sci. Algérie, Zool., v, 35, 1850 (Algiers); Günther, I, 135, 1859; Steindachner, Ichth. Beitr., XII, 5, 1882 (identified with *S. undulosus*).
Parepinephelus acutirostris Bleeker.

Cerna acutirostris Doderlein, Revista del Genere *Epinephelus* o *Cerna*, 1882, 59 (Palermo; description and full synonymy).

Serranus undulosus Cuv. & Val., II, 295, 1828 (Brazil); Steindachner, Ichth. Beitr., V, 127, 1876 (Rio Janeiro); Günther, I, 143, 1859 (said to have "pectorals yellow"); Steindachner, Ichth. Beitr., XII, 1882, 3 (Brazil; Port Said; Beiruth; Messina).

Trisotropis undulosus Poey, Ann. Lyc. Nat. Hist. N. Y., 1869, 305 (after one of the original types).

Serranus fuscus Lowe "Trans. Cambr. Philos. Soc., VI, 196, 1836" (Madeira); Günther, I, 1859, 134 (Madeira; Canary Islands); Steindachner, Ichthyol. Bericht., IV, 1867, 14, Taf. 2 (Cadiz; Teneriffe).

Serranus emarginatus Valenciennes, "Ichthyol. Îles Canaries, 10, 1835 to '50" (Canary Is.).

Serranus tinca Cantraine "Nouv. Mém. Acad. Brux., 1831, XI."

Cerna nebulosa Cocco "Indice Pesci Messina; Gen. 45, sp. 2," 1844 (Palermo).

Cerna macrogenis Sassi, "Descr. Genova e il Genovasato, I, 139," 1846.

Epinephelus chalinius Cope, Trans. Am. Philos. Soc., 1871, 465 (St. Martin's).

Cerna acutirostris var. *lata*, Doderlein, *l. c.*, 74 (Palermo; monstrous form).

Habitat.—West Indies, Brazil, Mediterranean Sea, and islands of eastern Atlantic.

Etymology.—*Ruber*, red; from the supposed coloration of the original bleached specimen.

This species is very well distinguished from all the other *Epinephelinæ* by the greatly increased number of the gill-rakers, a character first pointed out by Dr. Bean.

The following description is taken from No. 4805, M. C. Z., from Rio de Janeiro, 13 inches long:

Body rather deep, compressed, the snout sharp, the anterior profile straight; mouth moderate, the maxillary extending just beyond eye, $2\frac{1}{3}$ in head; canine teeth small; preopercle with a salient angle. Gill-rakers very long and slender, x+31, the longest four-fifths diameter of eye and $7\frac{1}{2}$ in head. Dorsal spines small; soft dorsal slightly angulated, the longest ray $2\frac{4}{5}$ in head; anal fin (in most specimens, especially in adults) sharply angulated as in *M. falcatus*, the longest ray $1\frac{7}{8}$ in head; caudal lunate, the angles well produced in the adult, the fin subtruncate in young; pectoral $1\frac{5}{6}$ in head. Head $2\frac{1}{2}$ in length; depth $2\frac{4}{5}$; D. XI, 16, A. III, 11. Scales, 95.

Coloration grayish olive, with reticulations of dark around irregular roundish pale spots; a black moustache along edge of maxillary; fins not much darker than body. Young with the markings more distinct than they are in the adults.

The coloration in this species differs from that of *M. bonaci* in this respect; in *M. rubra* the reticulations belong to the dark ground color; in the other the dark spots of the ground color are surrounded by paler reticulations.

A genuine specimen of this species is in the museum at Cambridge, sent by Poey from Havana, and therefore presumably a type of one of Poey's nominal species. I am unable, however, to identify it with any of these, as none show the combination of angular preopercle and paler spots surrounded by darker reticulations of the ground color.

There seems to be no reason for considering the *Sparus scirenga* as this species rather than as some one of the others found in the waters of Sicily. We are informed by our friend, M. Alexandre Thominot, of the Musée d'Histoire Naturelle at Paris, that the types both of *acutirostris* and *undulosus* possess numerous gill-rakers. There is, therefore, no doubt of the correctness of the current identification of this species.

We have two young examples sent by Dr. Doderlein from Palermo. These agree entirely with young examples from America. All of the large examples which we have seen have the anal angulated as in *M. falcata*. Doderlein makes no mention

of this character and his figures do not show it, and it is not shown in the figures published by Dr. Steindachner. Dr. Steindachner, however, states that while most of his specimens have the anal rounded, a number from Rio Janeiro and Messina have its outline angulated. Possibly two varieties or species both with many gill-rakers are confounded under the name *rubra*. This seems doubtful, however, as the agreement in other respects is very close among all the specimens examined by us and those figured by authors.

We retain for this species the early but inappropriate name of *ruber*, as we have little doubt that the original *Epinephelus ruber* was the young of this species.

This typical specimen—6½ inches (m. 165) long is still preserved in the University of Berlin. It has been redescribed by Professor Peters, and his account shows an almost complete agreement with the young of *acutirostris* in all respects except the coloration. The coloration is now wholly pale or bleached, a fact which led Bloch to suppose that it had been red.

At my request, Dr. F. Hilgendorf, of the University of Berlin, has again examined the species. He sends a drawing of the head, which shows a full agreement in form of mouth and nostrils with M. *acutirostris*. He adds the following notes (translated):

The gill-rakers are indeed numerous. I count 24 on the ceratobranchial of the first arch. The longest of these measures 6½mm.

The points in which *ruber* differs from *acutirostris* (compared with a larger example—12581, m. 283 long, from Athens) are the following: The pale coloration which is hardly to be explained by bleaching, as the dark-brown pigment suffers little, nor is it to be accounted for by difference in age. The caudal is in *ruber* apparently strongly rounded, and the pectorals as well as ventrals are longer in *ruber*. The ventrals reach at least to the vent. The point of the pectoral is 78mm from the snout, 86mm from the end of the caudal (as 7 to 8). In *acutirostris* these numbers are respectively 123mm and 160 mm (as 3 to 4). This difference may be expressed by saying that in *acutirostris* (or in old examples?) the hinder parts of the body are more stretched. The streaks on the sides shown in Bloch's figure are merely the boundaries of the groups of muscles.

The difference in the form of the caudal above noticed may, we know, be due to age, as in specimens of 6 inches it is very rarely lunate. The difference in form is not unlikely also a matter of age. The pale color of the type of *Epinephelus ruber* may be due to exposure of the type to sunlight. A few weeks of such exposure will destroy all pigment cells. As the specimen has now been more than a century in alcohol, such an exposure may have some time taken place.

Genus XII.—DERMATOLEPIS.*

Dermatolepis Gill, Proc. Ac. Nat. Sci. Phila., 54, 1861 (*punctatus*).
Lioperca Gill, Proc. Ac. Nat. Sci. Phila., 237, 1862 (*inermis*).

TYPE.—*Dermatolepis punctatus* Gill.

Etymology.—Δέρμα, skin; λεπίς, scale.

This well-marked genus is allied to *Epinephelus*, but shows some positive affinities with *Rypticus*. Two species are known, both fully described in the paper of Jordan & Swain. To these we venture to add a third, known only from a rather insufficient description given by Dr. Steindachner.

* Closely allied to *Dermatolepis* is the genus *Cromileptes* Swainson (= *Serranichthys* Bleeker), based on *Serranus altivelis* Cuv. & Val. The latter genus has but ten dorsal spines; the anterior profile is concave and the dorsal fin extremely high.

ANALYSIS OF SPECIES OF DERMATOLEPIS.

a. [Dorsal rays XI, 17; scales very small, some of them ctenoid; interorbital space not half diameter of eye, which is 4⅓ in head; maxillary reaching middle of eye; angle of preopercle salient, with 5 to 7 strong teeth, the two lowermost being turned forward; lower limb of preopercle entire; third dorsal spine highest, twice diameter of eye; anal spines graduated; pectoral as long as from snout to edge of preopercle; color brown, the scales edged with darker; fins brownish. D. XI, 17, A. III, 8.] (*Steindachner*) ..... ANGUSTIFRONS, 54.

aa. Dorsal rays XI, 19; scales all cycloid, imbedded (115 to 125 in lat. l.); head about 2⅔ in length; depth 2⅓; preopercle without salient angle.

b. Preopercle evidently serrate, the serrate rather coarse and blunt; upper jaw with very small canines; pectoral fins long, more than two-thirds length of head, reaching vent; anal spines rather strong; dusky olive, with large rounded whitish spots; no black spots on head; a whitish streak from snout through eye toward front of dorsal ..... INERMIS, 55.

bb. Preopercle subentire; canine teeth obsolete; pectoral fins short, not two-thirds length of head and not reaching vent; anal spines short; dusky olive, with round whitish spots; head with smaller black spots ..... PUNCTATUS, 56.

54. DERMATOLEPIS ANGUSTIFRONS.

Serranus angustifrons Steindachner, Verh. Zool.-bot. Gesellsch., Wien, 1864, XIV, 230, tafel vii, figs. 2, 3, (Cuba.)

Habitat.—West Indian fauna.

Etymology.—*Angustus*, narrow; *frons*, forehead.

We know nothing of this species except what is contained in the original description. Were it not for the statement that the scales are ctenoid, we should refer it without hesitation to the genus *Dermatolepis*. As it is, we know of no better place for it, as it is not a genuine *Epinephelus*.

The following is Dr. Steindachner's description:

Serranus (Cerna) ongus, spec. Bloch, Günther (?), an Serranus angustifrons n. sp.

(Tafel VII, Fig. 2, 3.)

Die von Cuv. Val. und Dr. Günther gegebene Beschreibung von *Serranus ongus* spec. Bl.=*S. dichropterus* ist so allgemein gehalten und arm an charakteristischen Merkmalen, dass ich nicht mit voller Bestimmtheit zu ermitteln vermag, ob ein im kais. Museum befindliches, von Cuba eingesendetes Exemplar zu *Serranus* [*Serranus*] *ongus* zu beziehen sei oder einer neuen Art angehöre, die wegen der auffallend geringen Breite der Stirne den Namen *S. angustifrons* rechtfertigen würde. Um die Hebung dieser Zweifel zu ermöglichen, gebe ich die naturgetreue Abbildung des Kopfes, von der Seite und von oben gesehen.

Der ganze Körper ist sehr stark comprimirt.

Die Kopflänge beträgt nahezu ¼ der Totallänge des Fisches; die Kopfbreite ist 3⅔ mal in der Kopflänge, die grösste Körperhöhe weniger als 4 mal in der Totallänge enthalten. Die geringste Körperhöhe am Schwanzstiele kommt nicht ganz ⅓ der grössten Leibeshöhe gleich. Das länglichrunde Auge stösst mit seinem oberen Rande fast an die Profillinie des Kopfes, liegt um etwas mehr als 1⅓ Augenlängen vom unteren Kopfrande entfernt. Die länge des Augendiameters ist 4⅓ mal in der Kopflänge, die lange Spitze des hinteren häutigen Kiemendeckelanhanges inbegriffen, enthalten.

Die Stirnbreite zwischen den Augen beträgt kaum ⅔ der Länge eines Auges. Das hintere Ende des Oberkiefers reicht in senkrechter Richtung bis unter die Mitte des unteren Augenrandes zurück. Der hintere Vordeckelrand ist convex und sehr fein gezähnt; der Vordeckelwinkel springt über den hinteren Rand vor, und trägt 5—7 starke Zähne, von denen die beiden unteren mit ihrer Spitze nach vorne gekrümmt sind. Der untere Vordeckelrand ist wie bei vielen Serranen (nicht aber bei allen, wie Dr. Günther in seiner Synopsis der Genera der Percidae Band I, pag. 55, des Catal. of the Acanth. Fish. of the Brit. Mus. angibt) ungezähnt; der knöcherne Theil des Kiemendeckels ist nach hinten in 3 stark plattgedrückte Stacheln ausgezogen, von denen der mittlere am längsten ist.

Von den 11 Dorsalstacheln ist der dritte am höchsten, beiläufig noch einmal so hoch als der erste oder 2 Augendiametern an Länge gleich. Der letzte Dorsalstachel erreicht die Länge von 1¼ Augendiameter; der höchste Gliederstrahl der Dorsale ist etwas höher als der dritte Stachelstrahl derselben Flosse.

Die Ventrale ist bedeutend, die Caudale nur ein wenig kürzer als die Pectorale; diese letztere ist von dreieckiger Gestalt, und der Entfernung der Schnauzenspitze vom oberen Ende des Vordeckels an Länge gleich.

Der zweite Analstachel ist länger als der letzte Dorsalstachel, aber etwas kürzer als der dritte Analstachel, übertrifft übrigens an Stärke sowohl diesen, als auch jeden der 11 Dorsalstacheln. Der gliederstrahlige Theil der Anale, so wie der Dorsale ist nach hinten abgerundet.

Der ganze Körper (mit Ausnahme der nackthäutigen Lippen) ist mit sehr kleinen, gezähnten Schuppen bedeckt, die Seitenlinie erstreckt sich bis zum Beginne des hinteren Längendrittels der schwach abgerundeten Schwanzflosse.

Der Körper ist von brauner Farbe, jede der kleinen Körperschuppen zeigt am, oder etwas vor dem freien Rande, und zwar parallel mit demselben einen schmalen schwärzlichen Saum. Die Brust- und Bauchflossen sind von schwärzlichbrauner Farbe, die Flossenhaut der Dorsale ist nur zunächst den einzelnen Stacheln von schwärzlicher, im übrigen von bräunlicher Färbung. D. 11–17. A. 3–8. P. 19.

55. DERMATOLEPIS INERMIS.

Serranus inermis Cuv. & Val., Hist. Nat. Poiss., IX, 436, 1833 (Antilles); Poey, Memorias Cuba, I, 1851, 54, lam. 4, f. 2 (Cuba); Günther, I, 1859, 153 (Cuba); Poey, Repertorio, I, 198, 1867.
Lioperca inermis Poey, Syn. Pisc. Cubens., 282, 1868 (Havana); Poey, Enum. Pisc. Cubens., 17, 1875.
Dermatolepis inermis Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 405 (Havana).

Habitat.—West Indies.
Etymology.—*Inermis*, unarmed.

Of this species we have examined a single specimen from Havana.

56. DERMATOLEPIS PUNCTATUS.

Dermatolepis punctatus Gill, Proc. Ac. Nat. Sci. Phila., 54, 1861 (Cape San Lucas); Gill, *op. cit.*, 250, 1862; Jordan & Gilbert, Proc. U. S. Nat. Mus., 229, 1881 (Socorro Island); Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 407 (Socorro Island).

Habitat.—Lower California; Revillagigedo Islands.
Etymology.—*Punctatus*, spotted.

This species is known from three specimens, one of these the type of the detailed account given by Jordan and Swain.

According to Dr. Gilbert, this species is very abundant about the Revillagigedo Islands, where it reaches a weight of about 50 pounds, and is exceedingly voracious.

Genus XIII.—BODIANUS.

Bodianus Bloch, Ichthyologia, 1790 (*guttatus*, *bodianus*, etc., species with entire preopercle and spine on opercle).
Cephalopholis Bloch & Schneider, Syst. Ichth., 1801, 311 (*argus* = *guttatus*).
Bodianus Cuvier, Règne Animal, 1817, 276 (*guttatus*, etc.).
Bodianus Gill, Proc. Ac. Nat. Sci. Phila., 237, 1862 (restriction of *Bodianus* Bloch to allies of *B. guttatus*).
Enneacentrus Gill, Proc. Ac. Nat. Sci. Phila., 105, 1865 (*ouatalibi* = *fulvus*).
Petrometopon Gill, Proc. Ac. Nat. Sci. Phila., 105, 1865 (*"guttatus"* = *cruentatus.*)
Menephorus Poey, Ann. Lyc. Nat. Hist. N. Y., X, 50, 1869 (*dubius*).

TYPE.—*Bodianus guttatus* Bloch.
Etymology.—*Bodiano, Pudiano*, Portuguese name of the larger Labroid fishes in Brazil.

We revert to our first opinion, and to the earlier opinion of Dr. Gill, that the name *Bodianus* should be used for this genus.

The name is a latinization of a Portuguese name of *Harpe rufa*, and the latter species, under the name of *Bodianus bodianus*, was included by Bloch among the original types of the genus *Bodianus*, it being wrongly supposed by Bloch to agree with other species referred to *Bodianus* in having an opercular spine and an entire preopercle.

Cuvier separated *Harpe rufa* from the others, retaining the name *Bodianus* for the Serranoids only, these agreeing more or less closely with the definition of Bloch.

Gill later restricted the name to the nine-spined allies of *Epinephelus*, his *Bodianus* corresponding to the use of the word in this paper. Later he transferred the name to *Harpe rufa*, dividing the group he had formerly called *Bodianus* into *Enneacentrus* and *Petrometopon*.

It seems to us that the restriction of *Bodianus*, made by Cuvier and Gill, by which the *Labridæ* were omitted from the genus is legitimate, and as it has priority over other arrangements we may accept it.

The investigations of Professor Peters on the types of Bloch show that *Cephalopholis argus* Bloch & Schneider is identical with *Bodianus guttatus* Bloch, and that the species in question has really but nine spines in its dorsal, as is shown in the figures both of Schneider and Bloch. *Cephalopholis* is therefore a strict synonym of *Enneacentrus*, and should be adopted unless *Bodianus* is substituted for both of them.

Three well-marked groups or subgenera are included among our species of *Bodianus*. We can not tell what value these groups may have without examining a much larger series of species than has yet been in our hands. Of our species, *fulvus*, the type of *Enneacentrus*, has the interorbital area channeled, its bones thin and smooth, while *cruentatus*, the type of *Petrometopon* Gill, has this area narrow and transversely convex, the bones hard and thickened.

The skulls of the other species have not been examined, but *tæniops* and *dubius* will probably be found to agree with *fulvus*, and *panamensis* with *cruentatus*.

Somewhat allied to *Bodianus* is the Asiatic genus *Variola* Swainson (= *Uriphæton* Swainson = *Phæthonichthys* Bleeker, *Pseudoserranus* Klunzinger); type *Serranus luti* or *louti*.

In *Variola* the soft dorsal, anal, and caudal are drawn out in long streamers, the canines are very strong, and there is a strong lateral canine on each side of the lower jaw, besides those in front. The cranium above resembles that of the *Serraninæ*, the smooth area of the vertex being large, the crests low. This genus is in some degree intermediate between the *Epinephelinæ* and *Serranus*.

ANALYSIS OF AMERICAN SPECIES OF BODIANUS.

a. Caudal fin rounded or subtruncate.

b. Sides with nine or ten dark cross-bands; sides of head and jaws with many round bluish or yellowish spots; a large jet-black spot behind eye; vertical fins edged with blue; lower jaw much projecting; preopercle very finely serrulate, its angle not salient; scales rather large (lat. l. about 80); second anal spine longest; caudal much rounded.

PANAMENSIS, 57.

bb. Sides without cross-bands.

c. Skull with interorbital area, narrow, convex, hard and thickened (*Petrometopon* Gill); body, head and fins more or less covered with scarlet or orange spots; about four round, inky spots along base of dorsal; lower jaw not strongly projecting; caudal fin much rounded; scales rather large (lat. l. about 80) ..... CRUENTATUS, 58.

x. Color reddish gray, with many vermilion spots, those most distinct on top of head. var. *cruentatus.*

xx. Color dusky olive, the spots dark orange red, those on the head obscure. var. *coronatus.*

cc. Skull with the interorbital area channeled, the bones thin and smooth (*Enneacentrus*); head and body with few or many small, blue, dark-edged spots; lower jaw strongly projecting.

d. Snout with one or two blue stripes; back of tail without conspicuous black blotch; caudal rounded; scales small (lat. l. about 115) ..... TÆNIOPS, 59.

dd. Snout without stripes; back of tail with two black spots; lower jaw with a black spot at tip; caudal subtruncate; scales moderate (lat. l. about 90) ..... FULVUS, 60.

f. Ground color lemon-yellow; blue spots few ..... var. *fulvus.*

ff. Ground color bright scarlet ..... var. *ruber.*

fff. Ground color brown ..... var. *punctatus.*

aa. Caudal fin lunate; body covered with blue spots. (*Menephorus* Poey.)

e. Body rather deep; preopercle evenly convex, without salient angle; mouth small, the lower jaw much projecting; gill-rakers slender, long, about x + 20; color carmine red, the head, back, and sides more or less covered with blue, dark-edged points; caudal tips black; some dark spots on maxillary and about eye ..... DUBIUS, 61.

57. BODIANUS PANAMENSIS.

Serranus panamensis Steindachner, Ichth. Beiträge, IV, 1, 1871, with plate (Panama).
Enneacentrus panamensis Jordan & Swain, *l. c.* 398 (copied).

Habitat.—Panama.

Etymology.—*Panamensis*, from Panama, where the species was first found.

This species is known to us from Dr. Steindachner's description.

Serranus gymnopareius, Cuv. & Val., II, 248 (from unknown locality); resembles this species somewhat, but it is probably not American.

Epinephelus striatus Bloch Ichth., taf. 330, said to be from Jamaica; is also unknown to us. Cuvier and Valenciennes regard this species as probably identical with the *gymnopareius*. In any case, the name *striatus* is preoccupied by *Epinephelus striatus*. *Bodianus gymnopareius* is said to resemble *Serranus scriba* in form, but it is especially distinguished by having the precopercle for the most part bare of scales; seven or eight brown bands across the body; some traces of a dark longitudinal band; caudal truncate; D. IX, 17; A. III, 7. It is described from a small, stuffed specimen.

58. BODIANUS CRUENTATUS.

(ENJAMBRE; CONEY; ROUGH HIND.)

a. Scarlet variety (*cruentatus*).

Perca guttata Bloch, Ichthyol., pl. 312, 1792 (description and figure from a drawing by Plumier); not of Linnæus.
Serranus guttatus Castlenau, Anim. nouv. ou rares, S. Amer., 1854, 312 (Brazil).
Enneacentrus guttatus Jordan & Swain, *l. c.* 399 (Havana).
Sparus cruentatus Lacépède, Hist. Nat. Poiss., IV, 157, tab. 4, f. 1, 1803 (on a copy of Plumier's drawing.).
Serranus apiarius Poey, Memorias Cuba, II, 143, 1860 (Havana).
Petrometopon apiarius, Poey, Synopsis Pisc. Cubens., 1868, 288; Poey, Enum. Pisc. Cubens., 1875, 20 (name only).

Serranus coronatus (pale variety) Günther, I, 124, 1859 (Puerto Cabello, Cuba, Jamaica, and Trinidad) Cope, Trans. Am. Philos. Soc., 1871, 466 (St. Croix; New Providence).

b. Brown variety (*coronatus*).

Serranus coronatus Cuv. & Val., II, 371, 1828 (Martinique); Poey, Repertorio, I, 198, 1868.
Serranus coronatus var. *nigriculus*, Günther, I, 1859, 124.
Enneacentrus guttatus coronatus Jordan & Swain, *l. c.* 398 (Key West; Havana).
Petrometopon guttatus Poey, Synopsis Pisc. Cub., 1868, 288 (Havana); Poey, Enum. Pisc. Cubens., 1875, 19.
Epinephelus guttatus Jordan, Proc. U. S. Nat. Mus., 1884, 125 (Key West).

Habitat.—West Indian fauna; Brazil to Florida Keys.

Etymology.—*Cruentatus*, dyed with blood.

As this species is in no wise concerned in forming the *Perca guttata* of Linnæus, we no longer retain for it the specific name of *guttatus*. The specific name next in date is the *cruentatus* of Lacépède. This appropriate name seems to be subject to no doubt, and must be adopted.

59. BODIANUS TÆNIOPS.

Serranus tæniops Cuv. & Val., II, 370, 1828 (Cape Verde); Günther, I, 121, 1859 (St. Vincent); Steindachner, Fische Afrikas, 1881, 4, taf. 1 ("very common on the coast of Senegambia to the Cape Verde Islands and Guinea; rare on the coasts of the Bahama Islands to Florida").
Bodianus tæniops Jordan & Gilbert, Syn. Fish. N. A., 1883, 919 (copied).
Enneacentrus tæniops Jordan & Swain, *l. c.*, 402 (copied).

Habitat.—West Indies and Florida Keys to west coast of tropical Africa.

Etymology.—*Ταινία*, band; *ὤψ*, face.

We have seen no specimens of this species.

60. BODIANUS FULVUS.

(GUATIVERE; NIGGER-FISH; YELLOW-FISH; BUTTER-FISH.)

a. Yellow variety (*fulvus*).

Turdus cauda convexa (the Yellow-fish) Catesby, Nat. Hist. Carolina, 1743, pl. x, f. 2.
Labrus fulvus Linnæus, Syst. Nat., ed. x, 1758, 287 (after Catesby); Linnæus, Syst. Nat., ed. xii, 1766, 479.
Enneacentrus fulvus Jordan & Swain, *l. c.* 402 (Havana).
Guativere amarilla Parra, Descr. Dif. Piezas, Hist. Nat. Cuba, 1787, lam. v. f. 2 (Cuba).
Holocentrus auratus Bloch, Ichthyol., VII, 57, 1792, taf. 236 ("East Indies"); Bloch & Schneider, Syst. Ichthyol., 1801. 314.
Serranus auratus Cuvier & Valenciennes, II, 364, 1828 (copied); Peters, Berlin. Monatsber., 1865, 103. (identification of *Holocentrus auratus* Bloch).
Bodianus guativere Bloch & Schneider, Syst. Ichth., 1801, 336 (based on both Parra's figures).
Serranus guativere Cuv. & Val., II, 383, 1828 (on Parra's second figure); Müller & Troschel, "Schomburgk's Hist. Barbad., 1848, 665;" Cope, Trans. Am. Philos. Soc., 1871, 466 (New Providence); Poey, Repertorio, I, 203.

b. Scarlet variety (*ruber*).

Carauna Marcgrave, Hist. Brasil, 1648, 147 (Brazil).
Guativere Parra, Descr. Dif. Piezas, Hist. Nat., 1787, lam. V, f. 1 (Cuba).
Perca punctata Bloch, Ichthyol., 1792, 314 (on a figure by Plumier).
Gymnocephalus ruber Bloch & Schneider, Syst. Ichthyol., 1801, 346, taf. 67 (on *Carauna* of Marcgrave; not *Epinephelus ruber* Bloch).
Serranus ouatalibi Cuv. & Val., II, 381, 1828 (Havana); Guichenot, Ramon de la Sagra, Cuba, Poiss., 1845, 15 (Havana); Müller & Troschel, Schomburgk's Exped. Barbad., 1848, 665 (Barbadoes); Günther, I, 1859, 120 (Jamaica; Cape Verde); Cope, Trans. Am. Phil. Soc., 1871, 466 (St. Croix; New Providence; St. Kitt's); Poey, Repertorio, I, 202, 1867.

Enneacentrus fulvus ouatalibi Jordan & Swain, *l. c.*, 402 (Havana).
Serranus carauna Cuv. & Val., II, 384, 1828 (Brazil); Castelnau, Anim. nouv. Amér. Sud, I, pl. i. f. 1. (Brazil).

c. Brown variety (*punctatus*).

Perca marina puncticulata (the NEGRO-FISH) Catesby, Nat. Hist. Carolina, etc., 1743, pl. 7 (Bahamas).
Perca punctata Linnæus, Syst. Nat., X, 1758, 291 (based on Catesby); Linnæus, Syst. Nat., XII, 1766, 485.
Enneacentrus punctatus Poey, Syn. Pisc. Cubens., 1868, 288 (Cuba); Goode, Bull. U. S. Nat. Mus., V, 1876, 59 (Bermudas).
Epinephelus punctatus Jordan & Gilbert, Syn. Fish. N. A., 1883, 541.
Bodianus punctatus Jordan & Gilbert, Syn. Fish. N. A., 919 (name only).
Enneacentrus fulvus punctatus Jordan & Swain, *l. c.* 403 (Havana).
Perca punctulata Gmelin, Syst. Nat., 1788, 1315 (after Catesby).
Enneacentrus punctulatus Poey, Enum. Pisc. Cubens., 20, 1875 (Havana).

Habitat.—West Indian fauna: Florida Keys to Brazil.
Etymology.—*Fulvus*, tawny in color.

Specimens of this abundant species are in the museum at Cambridge from St. Thomas, Sombrero, Barbadoes, Havana, Nassau, Camaru, Maranhão, and Rio de Janeiro. We have also examined specimens from Bahia.

61. BODIANUS DUBIUS.

Serranus dubius Poey, Memorias, II, 142, 1860 (Cuba).
Enneacentrus dubius Poey, Synopsis Pisc. Cubens., 289, 1868.
Menephorus dubius Poey, Ann. Lyc. Nat. Hist. N. Y., X, 50, 1869; Poey, Enumeratio Pisc. Cubens., 1875, 21.
Enneacentrus dubius Jordan & Swain, *l. c.*, 405 (copied).
? *Menephorus punctiferus* Poey, Enumeratio Pisc. Cubens., 21, 1875 (Cuba).

Habitat.—Cuba.
Etymology.—*Dubius*, doubtful.

Two specimens of this species were known to Professor Poey, one 155 mm long, which became the type of *Serranus dubius;* the other, 250 mm, which became the type of *Menephorus punctiferus.* The two specimens probably belong to the same species, as the differences indicated are of slight value.

I find in the museum at Cambridge a third specimen, without label to indicate its origin. The following is a description of this specimen, which is about 9 inches in length:

Head, $3\frac{1}{5}$ in length; depth, $2\frac{5}{6}$. D. IX, 11 + (the fin having been injured in youth); A. III, 9. Scales, 96.

Body rather deep and compressed, formed much as in *Bodianus fulvus;* head anteriorly pointed, the profile forming a slight, even curve. Mouth small; maxillary extending to posterior edge of pupil, $2\frac{1}{5}$ in head; lower jaw much projecting; teeth moderate, the anterior canines in both jaws rather strong. Interorbital space narrow. Eye moderate, $4\frac{1}{2}$ in head, as long as snout. Preopercle finely serrate, its outline evenly convex. Gill-rakers slender and long, x + 20. Scales moderate, strongly ctenoid. Caudal fin lunate, its angles pointed, the inner rays $2\frac{1}{3}$ in head, the outer $1\frac{3}{5}$. Dorsal spines low, stiff, the longest 3 in head; outline of the fin not notched. Anal fin high and rounded, its longest rays $2\frac{1}{3}$ in head. Second anal spine stronger than third, but scarcely longer, $3\frac{1}{4}$ in head. Pectoral long, reaching past tips of ventrals, $1\frac{1}{6}$ in head.

Color much as in *Bodianus fulvus ruber*—bright red; head, back, and sides covered with blue points which are edged with blackish; dorsal edged with dusky; caudal tips black above and below; maxillary with a row of dark spots; some dark spots about eye.

Genus XIV.—PARANTHIAS.

Brachyrhinus Gill, Proc. Acad. Nat. Sci. Phila., 1862, 236 (*creolus=furcifer*) (preoccupied in entomology).

Paranthias Guichenot, Ann. Soc. Linn. Maine-et-Loire, X, 1868 (*furcifer = creolus*).

TYPE.—*Serranus furcifer* Cuv. & Val.

Etymology.—Παρά, near; *Anthias*, a related genus.

This is one of the most strongly marked of our Serranoid genera, well distinguished among the *Epinephelinæ* by the number of fin rays (D. IX, 18), by the deeply forked caudal, and by the form of the mouth and frontal region, in which respects it bears much resemblance to the *Anthiinæ*. But one species is known, a beautifully colored fish, inhabiting deep waters.

ANALYSIS OF THE SPECIES OF PARANTHIAS.

a. Body moderately elongate, strongly compressed; the profile convex and the snout short, as in the suborder *Anthiinæ;* snout about 4 in head; eye about 4; maxillary reaching to below middle of eye, 2⅔ in head; maxillary broadened posteriorly, its surface scaled, as in *Anthias;* teeth small, recurved, in a narrow band in each jaw; two to four straight canines near the front of each jaw; preorbital very narrow; preopercle finely serrate, with salient angle or enlarged teeth; gill-rakers slender; scales small, closely and regularly imbricated, most of them strongly ctenoid; dorsal fin low, the spines strong, the third longest, 2½ in head; soft rays of dorsal low, scarcely higher than longest spine; anal short, its longest (second) soft ray 2 in head, its third spine longest, 2⅔ in head; ventrals narrow, not reaching vent; pectorals lanceolate, as long as head; humeral scale long; color bright red, or salmon color, with three small violet spots, one on side of back and one or two on the tail, a bar of similar color extending from upper corner of pectoral across the humeral process; sides with faint oblique streaks along the rows of scales; dorsal fin with a longitudinal blackish streak. Head, 3⅓ in length; depth, 3. D. IX-18; A. III, 9. Scales, 90 to 120.....FURCIFER, 62.

62. PARANTHIAS FURCIFER.

(RABIRUBBIA DE LO ALTO.)

Rabirrubia de lo alto Parra, Piezas de Hist. Nat. Cuba, 43, lam. 20, fig. 2, 1787 (Havana).

Serranus furcifer Cuv. & Val., Hist. Nat. Poiss., II, 264, 1828 (Brazil).

Anthias furcifer Günther, Cat. Fish. Brit. Mus., I, 91, 1859 (Brazil).

Paranthias furcifer Guichenot, Ann. Linnæan Soc., x, 1868; Jordan, Cat. Fish. N. Am., 83, 1885 (name only); Jordan, Proc. U. S. Nat. Mus., 377, 1885 (Cape San Lucas; Galapagos Isl.; Panama); Jordan, Proc. U. S. Nat. Mus., 1886, 39 (Havana); Jordan, Proc. U. S. Nat. Mus., 1889, 181 (Charles, Chatham, and Albemarle Islands, Galapagos).

Brachyrhinus furcifer Poey, Ann. Lyc. Nat. Hist., 34, 1871 (Cuba); Poey, Enumeratio Pisc. Cubens., 19, 1875 (Havana); Jordan & Gilbert, Synopsis Fish. N. Am., 916, 1883.

Serranus creolus Cuv. & Val., Hist. Nat. Poiss., II. 265, 1829 (Martinique; San Domingo); Storer, Synopsis Fish. N. Am., 278, 1846 (copied); Günther, Cat. Fish., Brit. Mus., I, 100, 1859(Cuba; West Indies); Günther, Fish. of Cen. Am., 409, 1869; Steindachner, Ichth. Beiträge, IV, 6, 1875 (Panama; Lower California; Galapagos).

Brachyrhinus creolus Gill, Proc. Ac. Nat. Sci. Phil., 249, 1862 (Cape San Lucas); Poey, Synopsis, 281, 1868 (Havana); Poey, Ann. Lyc. Nat. Hist. New York, 46, 1871.

Paranthias creolus Guichenot, Ann. Linnæan Soc., X, 1868.

Corvina oxyptera Dekay, New York Fauna, Fishes, 1842, 77, pl. xxx, f. 96.

Serranus colonus Valenciennes, Voyage Vénus, Zool., 300, pl. 2, fig. 1, 1846 (Galapagos Isl.).

Habitat.—Both coasts of tropical America.

Etymology.—*Furcifer*, one who carries a fork, from the form of the tail.

We have examined numerous specimens of this species from Cuba, Cape San Lucas, and the Galapagos Islands. We are unable to distinguish the Pacific coast form (*colonus*) from the Atlantic *furcifer*.

The skeleton of the species has been described in detail by Dr. Günther (I, 101).

Genus XV.—HYPOPLECTRUS.

Plectropoma species Cuvier & Valenciennes (not type).
Hypoplectrus Gill, Proc. Ac. Nat. Sci. Phila., 1862, 236 (*puella*).

TYPE.—*Plectropoma puella* Cuv. & Val.

Etymology.—Ὑπό, below; πλῆκτρον, spur.

The species of this genus agree very closely with the type of *Serranus*, *Prionodes*, etc., differing chiefly in the form of the body, which is more deep and compressed than in the other groups allied to *Serranus*. The skull differs from that of *Prionodes* chiefly in the development of the occipital crest, which, in accordance with the form of the body, is much elevated. All the species have several antrorse serræ on the lower limb of the preopercle, much as in *Plectropoma*, *Acanthistius*, and related genera, but smaller than in any of these. The species have been usually placed in *Plectropoma*, but, except the analogous armature of the preopercle, we know of no natural character which would tend to show any special affinity between *Plectropoma* and *Hypoplectrus*. In the form of the body there is, however, some resemblance between *Hypoplectrus* and *Gonioplectrus*.

The species of *Hypoplectrus* are all American, and a study of their relations offers many difficulties.

We have examined typical examples of a large number of the nominal species. While each of these shows certain striking peculiarities in color, most of them are absolutely identical in other respects. Moreover, even among those in which the coloration seems most sharply defined there are many variations. After an examination of the large series of typical forms sent by Professor Poey to the museum at Cambridge, we find ourselves driven to the conclusion that nearly all the forms of *Hypoplectrus* constitute but a single species, subject to almost endless variations in color. This view we here adopt, leaving for convenience' sake the various nominal species to stand as color varieties, produced by the action of some agencies as yet unknown.

ANALYSIS OF THE SPECIES OF HYPOPLECTRUS.

a. Scales large, 6–46–13; body short and deep, the depth 2¼ in length; head 2⅔; profile from dorsal to occiput convex, concave above eye; preorbital narrow; maxillary reaching to below middle of eye; lower jaw slightly included; teeth strong, large teeth in front ⅙; fourth dorsal spine highest, 2½ in head; middle caudal rays little shorter than the outer ones; pectoral reaching anal; teeth of preopercle growing larger downwards; angle and lower limb with about nine strong radiating serræ; those nearest the angle largest, the others directed more and more forwards. Color (of the single specimen known), black with violet luster; faint, pale streaks along the rows of scales on lower parts of body; caudal fin abruptly translucent yellowish; pectorals colorless; tips of dorsal and anal spines and edge of soft rays abruptly whitish..... LAMPRURUS, 63.

aa. Scales moderate, 60 to 65 in the lateral line (8–60–20 to 11–65–30); dorsal rays X, 15, depth 2 to 2¼ in length, the head about 3; maxillary 2 in head; caudal fin slightly lunate: fourth dorsal spine highest, 2⅔ in head; pectorals narrow, about reaching second anal spine; gill-rakers short and slender, x + 12. Coloration extremely various, the following being the nominal species or varieties thus far described..... PUELLA, 64.

b. Soft dorsal checkered or spotted with pale blue or crossed by blue lines (these occasionally obsolete).

c. Body all violet with five or six more or less distinct black cross-bands, the middle one broadest, covering the space from the fourth to the tenth dorsal spine and meeting its fellow under the belly; the band at the nape broad and saddle-like, bounded by two pale cross-streaks on nape, opercle, and cheek; snout pale, a pale shade across it; ventrals pale or dark; other fins, except spinous dorsal mostly pale. Scales 8–60–20.

x. Cheek with a blue band before eye and some blue spots before it, var., *puella* 64 *a*.

x. Cheek without blue band; no blue spots on snout; colors duller, var. *vitulinus*, 64 *b*.

cc. Body and head yellow anteriorly; body abruptly black posteriorly, the black extending forward to a wavy line reaching from first dorsal spine to vent; a broad dark blue band in front of eye, bordered by sky-blue; fins chiefly orange; ventral and anal bordered by sky-blue ..... var. *pinnavarius*, 64 *c*.

ccc. Body dusky, the head and belly orange, the top of head olivaceous; a black spot on each side of caudal peduncle close behind dorsal; black band or spot in front of eye not bordered by blue; cheeks, opercles, and breast with vertical lines of metallic blue; dorsal yellowish; pectoral and caudal orange; a black spot in the axil; upper margin of pectoral blue; anal orange with blue border; ventral greenish, its base orange..... var. *maculiferus*, 64 *d*.

bb. Soft dorsal plain, without distinct blue lines or spots.

d. Preorbital region with one or more dark blue stripes, bordered by bright sky-blue (not fading in spirits).

e. Body yellow anteriorly, black posteriorly, the black extending forward to a line joining the nape and last anal ray; fins orange; a single blue-black stripe or spot in front of eye, ocellated with sky-blue; caudal peduncle very dark above. var. *guttavarius*, 64*e*.

ee. Body all orange yellow; fins orange; snout and lower jaw blue; two blue stripes, each bordered with sky-blue, before the eye..... var. *gummigutta*, 64*f*.

dd. Preorbital region without blue stripes; scales usually (?) smaller (11–65–30).

f. Preorbital region with violet spots; a round black spot on side of caudal peduncle; dorsal light greenish; body light olive-green above, reddish below; pectorals pale yellow, the first ray blue; ventrals, anal, and caudal light orange..... var. *aberrans*, 64*g*.

ff. Preorbital region without distinct violet spots.

g. General color blackish, brown or yellowish—not indigo-blue.

h. Color brownish, the middle of the front of body yellowish; fins all yellow except the ventrals, which are black ..... var. *accensus*, 64 *h*.

hh. Color yellowish pink; caudal and pectorals pale; ventrals and anal bright light blue..... var. *affinis*, 64 *i*.

hhh. Color of body black, with violet shades.

i. Pectoral and caudal fins abruptly bright yellow ..... var. *chlorurus*, 64*j*.

ii. Pectoral and caudal fins violet black, like the rest of the body .. var. *nigricans*, 64 *k*.

gg. General color deep indigo blue everywhere on body and fins; body with four to six broad cross-bars of darker blue.

j. Cheeks plain, without distinct stripes ..... var. *indigo*, 64 *l*.

jj. Cheeks with a dark blue suborbital band, between two bands of clear blue. var. *bovinus*, 64 *m*.

aaa. Scales small, about 80 in the lateral line.

k. [Caudal moderately emarginated. Color saffron-yellow, orange on caudal, anal, and ventrals; a narrow blue band from eye across cheek and some small blue spots on side of muzzle; a narrow blue line along upper edge of preopercle; two faint vertical lines on opercle; back brownish anteriorly; jaws, pectoral, and dorsal fins saffron-yellow. Eight teeth on lower margin of preopercle. Depth 2¼ in length. Scales, 12–81–32 [(*Cope*). CROCOTUS, 65.

kk. [Caudal forked. Color purple with lighter cloudings; fins colorless, the external caudal ray darker; caudal deeply lunate, the external rays much prolonged, especially those of the upper lobe, which are twice as long as the middle rays. Depth 2½ in length. Scales 9–76–29.] (*Goode & Bean*)..... GEMMA, 66.

63. HYPOPLECTRUS LAMPRURUS.

Serranus lamprurus Jordan & Gilbert, Bull. U. S. Fish Comm., 322, 1881 (Panama).
Hypoplectrus lamprurus Jordan, Proc. U. S. Nat. Mus., 376, 1885 (Panama).

Habitat.—Panama fauna.

Etymology.—*Λαμπρός*, bright; *ὀυρά*, tail.

This species is known only from a single specimen, taken by Professor Gilbert at Panama.

It is well distinguished from the Atlantic species by the much smaller scales. The single type has almost exactly the coloration of the form called *Hypoplectrus chlorurus*. We can only guess as to the color variations which it may undergo.

64. HYPOPLECTRUS PUELLA.

(VACA.)

a. var. *puella.*

Plectropoma puella Cuv. & Val., Hist. Nat. Poiss., II, 405, plate 37, 1828 (Martinique); Storer, Synopsis Fish. N. Am., 282, 1846 (copied); Poey, Memor. Cuba, I, 62, 1851 (Havana); Günther, Cat. Fish. Brit. Mus., I, 165, 1859 (Jamaica).

Hypoplectrus puella Poey, Synopsis Pisc. Cubens., 290, 1868 (Havana); Poey, Enumeratio, 23, 1875, (Cuba).

b. var. *vitulinus.*

Plectropoma vitulinum Poey, Memor. Cuba, I, 68, 1851 (Havana).
Hypoplectrus vitulinus Poey, Enumeratio, 23, 1875 (Havana).

c. var. *pinnivarius.*

Hypoplectrus pinnivarius Poey, Synopsis Pisc. Cubens., 291, 1868 (Havana); Poey, Enumeratio, 24, 1875 (Havana).

d. var. *maculiferus.*

Hypoplectrus maculiferus Poey, Ann. Lyc. Nat. Hist. N. Y., X, 78, tab. 1, X, 2, 1871 (Havana); Poey, Enumeratio, 24, 1875 (Havana).

e. var. *guttavarius.*

Plectropoma guttavarium Poey, Memor. Cuba, I, 70, 1851 (Havana); Günther, Cat. Fish. Brit. Mus., I, 166, 1859 (copied); Cope, Trans. Am. Phil. Soc., Phil., XIV, 466, 1871 (St. Croix).

Hypoplectrus guttavarius Poey, Synopsis Pisc. Cubens., 291, 1868 (Havana); Poey, Enumeratio, 24, 1875 (Havana).

Plectropoma melanhorina Guichenot, "Poiss., in Ramon de la Sagra, Hist. Cuba, 18, pl. 1, fig. 1" (about 1855.)

f. var. *gummigutta.*

Plectropoma gummigutta Poey, Memor. Cuba, I, 70, 1851 (Havana); Günther, Cat. Fish. Brit. Mus., I, 166, 1859 (copied).

Hypoplectrus gummigutta Poey, Synopsis Pisc. Cubens., 290, 1868 (Havana); Poey, Enumeratio, 23, 1875 (Havana).

g. var. *aberrans.*

Hypoplectrus aberrans Poey, Synop. Pisc. Cubens., 291, 1868 (Havana); Poey, Enumeratio, 24, 1875 (Havana).

h. var. *accensus.*

Plectropoma accensum Poey, Memor. Cuba, I, 72, 1851 (Havana).

Hypoplectrus accensus Poey, Synopsis Pisc., Cubens., 290, 1868 (Havana); Poey, Enumeratio, 24, 1875 (Havana).

i. var. *affinis.*

Plectropoma affine Poey, Memor. Cuba, II, 427, 1860 (Havana).

Hypoplectrus affinis Poey, Enumeratio, 24, 1875 (Havana).

j. var. *chlorurus.*

Plectropoma chlorurum Cuv. & Val., Hist. Nat. Poiss., II, 406, 1828 (Martinique); Storer, Synopsis Fish. N. Am., 283, 1846 (copied); Günther, Cat. Fish. Brit. Mus., I, 167, 1859 (Martinique); Cope, Trans. Am. Phil. Soc., Phil., XIV, 466, 1871 (St. Croix); Vaillant & Bocourt, Miss. Sci. Mex., IV, 104, 1874, pl. v, f. 2.

Hypoplectrus chlorurus Poey, Synopsis Pisc. Cubens., 290, 1868 (Havana).

Serranus chlorurus Jordan & Gilbert, Synopsis Fish. N. Am., 537, 1883.

l. var. *nigricans.*

Plectropoma nigricans Poey, Memor. Cuba, I, 71, 1851 (Havana).

Hypoplectrus nigricans Poey, Synopsis Pisc. Cubens., 290, 1868 (Havana); Poey, Ann. Lyc. Nat. Hist., 35, 1871 (Cuba); Poey, Enumeratio, 24, 1875 (name only); Jordan & Gilbert, Synopsis Fish. N. Am., 918, 1883; Goode & Bean, Proc. U. S. Nat. Mus., 238, 1882 (Gulf Mexico); Jordan, Proc. U. S. Nat. Mus., 149, 1884 (Florida Keys); Jordan, Cat. Fish. N. Am., 83, 1885.

m. var. *indigo.*

(AÑIL.)

Plectropoma indigo Poey, Memor. Cuba, I, 69, 1851, tab. 3, fig. 1 (Havana); Günther, Cat. Fish. Brit. Mus., I, 166, 1859 (copied).

Hypoplectrus indigo Poey, Synopsis Pisc. Cub, 290, 1868 (Havana); Poey, Ann. Lyc. Nat. Hist., 35, 1871 (Cuba); Poey, Enumeratio, 23, 1875 (name only); Jordan, Proc. U. S. Nat. Mus., 1886, 39 (Havana).

n. var. *bovinus.*

Plectropoma bovinum Poey, Memor. Cuba, I, 69, 1851 (Havana); Günther, Cat. Fish. Brit. Mus., I, 166 (copied).

Hypoplectrus bovinus Poey, Synopsis Pisc. Cubens., 290, 1868 (Havana); Poey, Enumeratio, 23, 1875 (Havana).

Habitat.—West Indian fauna.

Etymology.—*Puella*, a little girl.

We have examined large numbers of specimens of this type in the museum at Cambridge, and elsewhere. The best series seen is that sent by Poey to the museum from Havana. So far as we can discover, the various nominal species of this type are absolutely identical in all respects except in color. Many of them—*e. g.*, *puella*, *indigo*, *chlorurus*—seem at first sight to be certainly different. Nevertheless each of these forms is subject to wide variations, and from the material which we have seen we can

draw no other conclusion than this. All belong to a single species, which varies excessively in its coloration. Blue, yellow, and black are arranged in great variety of patterns, in different specimens, and the cause of such variation is still unknown.

The following localities are represented in the specimens examined by us:

Puella, Havana; St. Thomas; St. Croix.
Vitulinus, Havana.
Pinnivarius, Havana.
Maculiferus, Havana.
Guttavarius, Havana.
Chlorurus, Havana.
Nigricans, Florida Keys; Havana; St. Thomas.
Indigo, Havana.

The other nominal species we have not seen.

65. HYPOPLECTRUS CROCOTUS.

Plectropoma crocota Cope, Trans. Am. Phil. Soc., Phil., XIV, 466, 1871 (St. Martin's, W. Indies).

Habitat.—West Indian fauna.

Etymology.—*Crocotus*, saffron color; from *crocus*, saffron.

We have not seen this species. The single known specimen is no longer to be found in the museum of the Academy at Philadelphia, Pa.

66. HYPOPLECTRUS GEMMA.

Hypoplectrus gemma Goode & Bean, Proc. U. S. Nat. Mus., 428, 1882 (Garden Key, Fla.); Jordan, Proc. U. S. Nat. Mus., 149, 1884; Jordan, Cat. Fishes N. Am., 83, 1885.

Habitat.—West Indian fauna; Florida Keys.

Etymology.—*Gemma*, a jewel.

Two specimens of *Hypoplectrus* have been described, both of which are said to differ from the type of *Hypoplectrus puella* in the smaller scales. These two, described under the specific names of *crocotus* and *gemma*, differ widely in color, and apparently in the form of the caudal fin.

As we know that the differences in coloration are almost valueless for specific distinction in this group, the assumed difference in the form of the caudal alone prevents us from regarding *crocotus* and *gemma* as color varieties of the same form. We have not seen either of these nominal species, both of which are known from a single specimen.

Genus XVI.—PARALABRAX.

Paralabrax Girard, Proc. Acad. Nat. Sci. Phila., 1856, 131 (*nebulifer*).
Atractoperca Gill, Proc. Acad. Nat. Sci. Phila., 1861, 165 (*clathratus*).
Gonioperca Gill, Proc. Acad. Nat. Sci. Phila. 1863, 80 (*albomaculatus*).

TYPE.—*Labrax nebulifer* Girard.

Etymology.—*Παρά*, near; *Labrax*, old name of the genus *Morone;* from the Greek *λάβραξ*, sea-bass.

This genus is very close to *Centropristis*, with which it agrees very nearly in the form of the skull.* The scales are, however, much smaller than in *Centropristes*, the

* We have not examined the skulls of *Paralabrax albomaculatus* or of *P. humeralis*, though we have no doubt of their general agreement in this respect with the other species.

caudal fin is always lunate, and some of the anterior dorsal spines are in all the species considerably elevated. The number of soft rays in the dorsal is also greater in *Paralabrax* than in *Centropristis*. The five known species of *Paralabrax* are found on the Pacific coast of America, while those of *Centropristis* are confined to the Atlantic coast.

There is no warrant for the separation of either *Atractoperca* or *Gonioperca* as genera distinct from *Paralabrax*.

ANALYSIS OF SPECIES OF PARALABRAX.

a. Interorbital area more or less scaly; the scales extending forward at least to the middle of pupil; gill-rakers x +14 to 17; preorbital broad, as broad as eye in adult; some of the serræ on lower limb of preorbital hooked forward.

b. Scales on top of head extending forward as far as front of eyes; no round dark spots anywhere except on cheeks and preorbital region; body rather elongate; lower jaw projecting; eye moderate, shorter than snout, about 5½ in head; mouth large, the maxillary 2⅔ in head, rather narrower than the preorbital; first two dorsal spines short, the third very long, three times second and nearly 2 in head; soft dorsal rather low; caudal slightly lunate; second anal spine as long as third and much stouter; pectorals moderate, 1½ in head; color greenish, with irregular pale and dark mottling and traces of dark oblique cross-bars; fins dusky, mottled; preorbital, suborbital, and cheeks profusely marked with round orange spots; a dark streak downward and backward from eye; head 2⅔ in length; depth 3⅓; D. X, 14; A. III, 7; scales 14–72–24 ..... NEBULIFER, 67.

bb. Scales on top of head extending forward only to middle of eyes; head and sides of body everywhere covered with dark orange spots; gill-rakers short and thick, x + 12, the longest 2½ in eye; body moderately elongate; lower jaw projecting, but less so than in *P. nebulifer*; eye small, 5 to 6 in head, shorter than snout; maxillary reaching middle of eye, 2⅔ in head; scales quite rough. Second dorsal spine short, not half the third, which is 1½ in head, the fourth scarcely shorter; second anal spine shorter than third; pectoral moderate, 1½ in head; caudal slightly concave; color olive brown, thickly covered everywhere above with dark hexagonal or roundish spots, so close together as to leave the ground color appearing as reticulations around them; these spots are more or less confluent on the back, and are most distinct, and tinged with orange on sides of head, on branchiostegals, and on base of pectorals; about seven dusky cross-bars along the sides, in which the spots are deeper in color and more confluent; a bluish stripe from eye across cheeks; lower parts yellow; soft dorsal and caudal with bronze spots. Head 3 in length; depth 3; D. X, 14; A. III, 7. Scales 12–70(pores)25 ..... MACULATOFASCIATUS, 68.

aa. Interorbital area chiefly naked,* the scales on top of head beginning more or less behind the pupil; gill-rakers, x + 17 to 22.

c. Preorbital rather broad, more than three-fourths width of eye; sides of back with large white spots; fourth dorsal spine usually higher than third, so that the posterior margin of the dorsal fin is deeply concave; snout 3⅓ in head; eye 5½; least width of preorbital 6; interorbital area flattish, the scales beginning opposite last part of pupil; maxillary 2; nostrils small, subequal; gill-rakers shortish, x + 19; first dorsal spine short; second one-third longer; third more than three times second; fourth still longer (in specimens examined by us, usually not longer in adults, according to Dr. Steindachner, 2⅔ in head), the fin thus very deeply notched; anal spines short, graduated, the second 4⅔ in head; caudal lunate; color, in alcohol, dark above, abruptly pale below; a large, dark, oblique dash below eye, covering most of cheek; a row of five, oblong, horizontal, white blotches just below lateral line; first and second largest, about as long as eye; a single one as large as third blotch above this row below the second to fourth rays of soft dorsal; caudal dusky, its central and posterior part pale; anal and ventral black; pectoral pale; spinous dorsal dusky at base; soft dorsal mottled with dark. Head 2⅔ in length; depth 3⅓; D. X, 14; A. III, 7; scales 70 ..... ALBOMACULATUS, 69.

* This character may prove unreliable. According to Dr. Steindachner, the top of the head is chiefly scaly in *Paralabrax humeralis*.

cc. Preorbital narrow, not two-thirds width of eye.

d. Caudal forked; snout $3\frac{1}{5}$ in head; eye $5\frac{1}{3}$; preorbital narrow, three-fifths width of eye; maxillary $2\frac{1}{3}$ in head; top of head naked from back part of eye; gill-rakers long, x + 17; teeth small; preopercle strongly serrate, the lower teeth turned forward; first dorsal spine short; second half longer; third $2\frac{2}{3}$ times length of second, 2 in head; fourth a little shorter, the others gradually shorter, the ninth longer than the second; anal spines small, graduated; the second $4\frac{1}{2}$ in head; pectoral long, $1\frac{1}{2}$ in head; caudal forked, the upper lobe the longer; Color (faded in our specimens), according to Steindachner, dark olive, with six or seven dark cross-shades; head with numerous bluish spots edged with darker; body with round dark brown spots, smaller than pupil, most conspicuous on caudal peduncle; vertical fins dusky especially at tip, their basal parts showing pale reticulations around dark spots; ventrals blackish; pectorals pale, with a large lunate dusky blotch at base. Head $2\frac{4}{5}$ in length; depth $3\frac{2}{5}$. D. X, 14; A. III, 7; scales 17–67(pores)–32..... HUMERALIS, 70.

dd. Caudal slightly lunate, not forked; body elongate, more compressed than in related species; snout pointed; eye shorter than snout, $4\frac{1}{2}$ in head; preorbital narrow, not so broad as maxillary, less than half width of eye; maxillary $2\frac{2}{5}$ in head; gill-rakers rather long, x + 20; third, fourth, and fifth dorsal spines about equal, the third twice the second, 2 in head; second anal spine longer than third; caudal fin slightly lunate; color grayish green, with obscure broad dusky streaks and bars; sides often shaded and mottled with bluish and greenish, but usually without distinct spots; a broad, dark, longitudinal shade along axis of body; belly plain silvery gray. Head 3 in length; depth 3; D. X, 14; A. III, 7. Scales 14–73–23..... CLATHRATUS, 71.

67. PARALABRAX NEBULIFER.

("JOHNNY VERDE.")

Labrax nebulifer Girard, Proc. Acad. Nat. Sci. Phil., 142, 1854 (Monterey).

Paralabrax nebulifer Girard, Proc. Acad. Nat. Sci. Phil., 132, 1856, (Monterey); Girard, U. S. Pac. R. R. Survey, 33, pl. xii, fig. 1, 1858 (Monterey); Günther, Cat. Fish. Brit. Mus., 1, 62, 1859 (Monterey).

Serranus nebulifer Steindachner, Ichth. Beiträge, III, 1, 1875 (Monterey; San Diego); Jordan & Gilbert, Proc. U. S. Nat. Mus., 456, 1880, (Monterey; San Pedro; San Diego); Jordan & Jouy, Proc. U. S. Nat. Mus., 12, 1881 (San Diego); Jordan & Gilbert, Proc. U. S. Nat. Mus., 47, 1881 (San Pedro, San Diego); Jordan & Gilbert, Proc. U. S. Nat. Mus., 278, 1881 (Ascension Isl.); Jordan & Gilbert, Synopsis Fish. N. Am., 536, 1883 (Monterey); Jordan, Cat. Fish. N. Am., 83, 1885; Jordan, Nat. Hist. Aquat. An., 413, 1886 (San Pedro; Monterey).

Habitat.—Coast of Southern California from Monterey to Magdalena Bay.

Etymology.—*Nebulifer*, bearing a cloud, from the coloration.

This species is common on the coast of southern California. It lives in shallow water and is regarded as a food-fish of excellent quality. It reaches a length of about 18 inches.

68. PARALABRAX MACULATOFASCIATUS.

(SPOTTED CABRILLA.)

Serranus maculatofasciatus Steindachner, Ichth. Notizen, VII, 5, 1868 (Mazatlan); Vaillant & Bocourt, Miss. Sci. au Mex., IV, 72, 1874; Jordan & Jouy, Proc. U. S. Nat. Mus., 12, 1881 (San Diego); Jordan & Gilbert, Proc. U. S. Nat. Mus., 46, 1881 (San Pedro; San Diego); Jordan & Gilbert, Synopsis Fish. N. Am., 536, 1883 (San Diego); Jordan & Gilbert, Bull. U. S. Fish Com., 107, 1882 (Mazatlan); Jordan, Cat. Fish. N. Am., 83, 1885 (name only); Jordan, Proc. U. S. Nat. Mus., 376, 1885 (Mazatlan); Jordan, Nat. Hist. Aquat. Anim., 1886, 414.

Serranus acanthophorus Bocourt, Ann. Sci. Nat., X, 1870, 223 (west coast of Mexico).

Habitat.—Lower Californian fauna, San Pedro to Mazatlan.

Etymology.—*Maculatus*, spotted; *fasciatus*, banded.

This species is abundant about San Diego, and thence southward as far as Mazatlan. It is a good food fish, similar in quality to the preceding species, but reaching a smaller size.

69. PARALABRAX ALBOMACULATUS.

Serranus albomaculatus Jenyns, Zoöl. Beagle, Fishes, 3, pl. 2, 1840 (Galapagos Archipelago); Günther, Cat. Fish. Brit. Mus., I, 105, 1859 (copied); Steindachner, Ichth. Beiträge, IV, 4, 1875, pl. 1, f. 2 (Panama; Galapagos); Jordan, Proc. U. S. Nat. Mus., 376, 1885.

Paralabrax albomaculatus Jordan & Bollman, Proc. U. S. Nat. Mus., 1889, 181 (Charles and Albemarle Islands; Galapagos).

Gomoperca (albomaculata) Gill, Proc. Ac. Nat. Sci. Phila., 1863, 80.

Serranus humeralis Günther, Proc. Zool. Soc. London, 1877, 68.

Habitat.—Galapagos Islands, north to Panama.

Etymology.—*Albus*, white; *maculatus*, spotted.

The specimens examined by us are in the museum at Cambridge and came from Indefatigable Island, James Island, and Albemarle Island, of the Galapagos group. No. 10,222, 2 feet in length, from Indefatigable Island, is the special type of our description. The peculiar and handsome coloration of this species separates it at once from the others. According to Dr. Steindachner this species is quite common in the deep channels separating the Galapagos islands from each other. Other specimens lately examined were taken by the *Albatross*.

70. PARALABRAX HUMERALIS.

Serranus humeralis Cuv. & Val., II, 246, 1828 (Chili); Lesson, "Voyage Coquille, Zool., II, 236;" Gay, Hist. Chile, Zool., II, 149, 1847; Günther, I, 104 (copied); Kner, Neue Fische aus dem Museum Godeffroy, 1868, 4 (Peru); Steindachner, Ichth. Notizen, VII, 3, 1868 (Chili).

Serranus semifasciatus Gay, Hist. Chile, Zool., II, 151, with plate, 1847 (Juan Fernandez).

Percichthys godeffroyi Günther (Iquique) (*fide* Steindachner).

Habitat.—Coasts of Peru and Chili.

Etymology.—*Humeralis*, pertaining to the humerus or shoulder, from the dusky shoulder.

We know this species from specimens (10097) in the museum at Cambridge, collected at Callao, Peru, by Dr. Steindachner. These specimens are doubtless identical with the very young examples originally described by Cuvier and Valenciennes, although their coloration is not quite the same.

These specimens differ in several respects from the description of *Serranus humeralis* given by Dr. Kner, but all probably belong to one species.

The figure and scanty description of *Serranus semifasciatus* Gay seem to agree fairly with *Paralabrax humeralis*.* The general characters, so far as shown in the figure agree very well, especially as to the general form, the armature of the preopercle, and the forms of the fins. The description is taken from the drawing, and is valueless as regards details, the fin-rays, except those of the spinous dorsal (x) not being counted.

The account of the coloration is apparently drawn from life, which doubtless explains the difference between it and that above given in the text.

* Dr. Steindachner observes (Ichth. Beitr., VII, 24, 1878): "*Percichthys godeffroyi*, Günther, aus Iquique ist ein Meeresbewohner, gehört zur Gattung *Serranus* und fällt mit *Serranus humeralis* C. V. = *S. semifasciatus* Gay zusammen, einer Art die nach Dr. Günther's systematischer Anordnung der Fische zur Gattung *Centropristis* bezogen werden müsste."

The following is the original description:

Serranus semifasciatus.

S. corpore elongato, supra cinereo-cœrulescente transverse vittis rubris fasciato; capite lateribusque frequentibus parvulis maculis rubescentibus variegatis; abdomine albicante-cœrulescente; dorsali medio emarginata caudalique fuscis rubro-punctatis; pectoralibus rufus; ventralibus ac anali nigrescentibus; oculis mediocribus, rubris.

Describimos esta especie segun un deseño que hicimos de ella en Juan Fernandez; es muy parecida de los anteriores Serranos, particularmente de los dos primeros; la forma general de su cuerpo se prolonga bastante; el dorso está redondeado y su altura es la cuarta parte de la longitud total; cabeza algo grande, cónica, y tan larga como la elevacion del Pez; hocico levemente arqueado; boca grande, y las dos quijadas casi iguales; los dientes no se perciben en el dibujo; ojos medianos y en medio de la cabeza; opérculo fina é igualmente dentado al rededor; la dorsal tiene una profunda escotadura entre su parte blanda y la parte espinosa; esta se compone de diez rayos sólidos, los dos primeros mas cortos que el tercero y cuarto, que son los mayores; los otros seis van disminuyendo proporcionalmente: la parte blanda es mas larga que la espinosa, igual en toda su estension y casi triangular; las pectorales son ovales y pequeñas á proporcion de la especie, aunque bastante anchas; la anal es tambien pequeña, con tres espinas, de las cuales la primera es la mas corta, y la segunda y tercera tan largas como los rayos blandos que las siguen; la caudal está un poco escotada; no podemos contar los rayos en el dibujo.

Color: de un azul ceniciento sobre el dorso, con seis ó siete medias bandas verticales de color de ladrillo, y los lados y la cabeza sembrados de infinitas manchitas rojizas; el veintre es azulado, levemente bañado de blanquizo; la dorsal y la caudal tienen manchas rojas sobre un fondo moreno; la pectoral parece bermeja; las aletas abdominales y la anal son negruzcas.

Longitud total, 11 pulg.

"Esta especie no es muy comun en los mares de Chile." (Gay, Historia de Chile, tomo II, pp. 151–152).

71. PARALABRAX CLATHRATUS.

(CABRILLA.)

Labrax clathratus Girard, Proc. Ac. Nat. Sci. Phil., 143, 1854 (San Diego).

Paralabrax clathratus Girard, Proc. Ac. Nat. Sci. Phil., 131, 1856; Girard, U. S. Pac. R. R. Survey, 34, 1858, pl. xii, fig. 5 (San Diego); Günther, Cat. Fish. Brit. Mus., I, 63, 1859 (San Diego).

Atractoperca clathrata Gill, Proc. Ac. Nat. Sci. Phil., 164, 1861.

Serranus clathratus Steindachner, Ichth. Beiträge, III, 1, 1875 (Monterey; San Diego); Jordan & Gilbert, Proc. U. S. Nat. Mus., 456, 1880 (Monterey; Santa Barbara; San Pedro; San Diego); Jordan & Jouy, Proc. U. S. Nat. Mus., 12, 1881 (San Pedro; Santa Barbara; San Diego; Monterey); Jordan & Gilbert, Proc. U. S. Nat. Mus., 47, 1881; Jordan & Gilbert, Synopsis Fish. N. Am., 535, 1883; Rosa Smith, Proc. U. S. Nat. Mus., 234, 1883 (Todos Santos Bay, Cal.); Jordan, Cat. Fish. N. Am., 83, 1885 (name only); Jordan, Nat. Hist. Aquat. An., 413, 1886.

Habitat.—Coast of southern California, from San Francisco to the Cerros Islands.

Etymology.—*Clathratus*, latticed, from the lattice-like markings.

This is the most abundant species of *Paralabrax* on the California coast. It is an excellent food fish, and it reaches a weight of nearly 5 pounds, and length of 18 inches.

Genus XVII.—CENTROPRISTIS.

Centropristes Cuvier, Règne Animal, Ed. 2, 1829 (*nigricans*).

Centropristis Cuvier & Valenciennes, Hist. Nat. Poiss., III, 56, 1829 (*nigricans*).

Triloburus Gill, Cat. Fish. East. Coast U. S., 30, 1861 (name only, *trifurca*).

TYPE.—*Coryphæna nigrescens* Bloch & Schneider = *Perca striata* L.

Etymology.—*Κέντρον*, spine; *πριστής*, saw.

This genus is very close to *Serranus*, from which it differs chiefly in the form of the upper part of the skull, which approaches somewhat more nearly to the condition seen in the *Epinephelinæ*. The supraoccipital crest is much longer than in *Serranus*, and it encroaches more on the frontal region. The three species of *Centropristis* are closely related, and are not very different from the species of *Paralabrax*.

ANALYSIS OF SPECIES OF CENTROPRISTIS.

a. Dorsal spines with dermal flaps, which scarcely project beyond the tip of the spine; longest dorsal spine less than half length of head (*Centropristis*).

b. Caudal fin with its angles little produced, the longest ray not exserted for a distance equal to the length of the fin; gill-rakers about 20; scales on cheek in more than seven rows; body robust, the back somewhat elevated anteriorly; eye small, nearly 5 in head; lower jaw projecting; maxillary 2¼ in head; teeth in broad bands, the canines small; posterior border of preopercle finely serrate, the angle and lower border with larger teeth; dorsal spines rather strong, the middle ones rather higher than the posterior, which are lower than the soft rays; highest dorsal spine 2 in head; none of the spines filamentous; pectorals very long, 1½ in head; anal spines graduated; color dusky brown or black with paler longitudinal streaks; dorsal with oblique light and dark stripes; young with a black longitudinal band, many dark cross-shades, and a large black spot on last dorsal spines. Sexes notably different, the fin rays longer in the male. Head, 2⅔ in length; depth 3. D. X, 11; A. III, 7. Scales 5–52–13.
STRIATUS, 72.

bb. Caudal fin with its upper and lower lobes filamentous, much produced, the middle rays still longer, length of longest ray in the adult 2 in body; gill-rakers about x + 12; scales on cheek in seven rows; color grayish, each side with three longitudinal rows of quadrate black blotches, the upper series obscure, the second from eye below the lateral line to caudal quite distinct, the third series composed of shorter spots on a level with the lower half of the pectorals; some jet-black spots about opercle and above axil; dorsal with a series of jet-black spots along its base; caudal with the middle rays black at their tips, the outer pale; jet-black spots on middle rays. D. X, 11; A. III, 7, lat. l., 52..... OCYURUS, 73.

aa. Dorsal spines, or some of them, tipped with fleshy filaments, which project considerably beyond the tip of the spine; longest dorsal spine about half length of head; caudal lobes more or less produced (*Triloburus* Gill).

c. Body rather elongate, little compressed, the anterior profile nearly straight; eye large, as long as snout, about 4 in head; mouth large, the lower jaw projecting, the maxillary 2 in head, reaching beyond middle of eye; lower edge of subopercle, interopercle, and preopercle finely serrate, the serræ on he angle scarcely enlarged; gill-rakers rather long, about x + 12; canines small; top of head naked; ten rows of scales on cheek; dorsal spines slender, graduated rapidly to the third or fourth, thence decreasing to the last; fourth dorsal spine 2 in head; anal spines graduated, the second 4 in head; pectorals 1⅓ in head; color olive-gray; sides with about seven broad, diffuse, brown bars extending from back obliquely forward to level of pectorals; a large black spot on membrane of last dorsal spines; dorsal filaments scarlet; caudal with irregular cross-rows of round brownish spots; other fins similarly marked. Sexes little different. Head 2⅔ in length; depth 3⅓. D. X, 11; A. III, 7. Scales 6–52–14.
PHILADELPHICUS, 74.

72. CENTROPRISTIS STRIATUS.

(THE BLACK SEA-BASS, BLACK-FISH, TALLY-WAG, HANNAHILL, BLACK-WILL, BLACK HARRY.)

Labrus striatus Linnæus, Syst. Nat., Ed. x, 1758, 285 ("America,") description very brief, but not to be referred to any other fish).

Perca atraria Linnæus, Syst. Nat., XII, 485, 1766 (Carolina); Gmelin, Syst. Nat., 1314, 1788 (copied); Bloch & Schneider, Syst. Ichthy., 88, 1801 (copied); Gronow, Syst., Ed. Gray, 111, 1854 (copied).

Centropristis atrarius Günther, Cat. Fish. Brit. Mus., I, 86, 1859 (New York); Holbrook, Ichth. S. Carolina, 42,1860 (Carolina); Gill, Cat. Fish. East Coast N. Am., 28, 1873; Goode & Bean, Fishes Essex Co., 19, 1879 (Nahant; Salem; Beverly Bar).

Serranus atrarius Jordan & Gilbert, Synopsis Fish. N. Am., 533, 1883; Goode & Bean, Proc. U. S. Nat. Mus., 238, 1882 (Gulf of Mexico); Jordan & Gilbert, Proc. U. S. Nat. Mus., 600, 1882 (Charleston); Bean, Cat. Internat. Fish. Ex. Lond., 61, 1883 (Matanzas River Inlet, Fla.); Jordan & Swain, Proc. U. S. Nat. Mus., 231, 1884 (Cedar Keys, Fla.); Jordan, Cat. Fish. N. Am., 82, 1885 (name only); Goode, Nat. Hist. Aquat. An., 407, 1886; Jordan, Proc. U. S. Nat. Mus., 1886, 27 (Beaufort, N. C.).

Blackfish Schöpf, Schriften der Naturforsch. Freunde, Berlin, VIII, 164, 1788 (New York).

Perca furva Walbaum, Artedi Piscium, 336, 1792 (after Schöpf).

Serranus furvus Jordan, Proc. U. S. Nat. Mus., 546, 1884; Jordan, Cat. Fish. N. Am., 82, 1885.

Coryphæna nigrescens Bloch & Schneider, Syst. Ichthy., 297, 1801 (New York).

Lutjanus trilobus Lacépède, Hist. Nat. Poiss., IV. 246, 1802 (locality unknown).

Serranus nigrescens Jordan & Gilbert, Synopsis Fish. N. Am., 917, 1883.

Perca varia Mitchill, Report Fishes N. Y., 415, pl. 3, fig. 6, 1815 (New York).

Centropristis varius Putnam, Proc. Essex Inst., 144, 1855 (Salem Harbor); Storer, Hist. Fish. Mass., 58, pl. ii, fig. 4, 1867.

Centropristes nigricans Cuv. & Val., Hist. Nat. Poiss., III, 37, pl. 44, 1829 (New York); Cuvier, "Règne Animal, Ed. Val., pl. 9 a, fig. 18;" Storer, Fish. Mass., 9, 1839 (Holmes' Hole); Dekay, New York Fauna, Fishes, 24, 1842, pl. ii, fig. 6; Linsley, "Cat. Fishes Conn., 1844;" Storer, Synopsis, 287, 1846.

Centropristes rufus Cuv. & Val., Hist. Nat. Poiss., III, 47, 1829 (Martinique?); Storer, Synopsis, 288, 1846 (copied).

Serranus rufus Jordan, Proc. U. S. Nat. Mus., 1886, 533 (note on type of *C. rufus*).

Habitat.—Atlantic coast of United States, Cape Ann to Florida.

Etymology.—*Striatus*, striped.

This is one of the common food fishes of our Atlantic coast, from Cape Cod at least as far south as the northern parts of Florida. It reaches a weight of about 3 pounds, and the quality of its flesh is excellent. Holbrook has maintained that the northern form of this fish (*Perca striata* = *furvus* = *nigricans*) is distinct from the southern *atrarius*. The northern form (*striatus*) is said to have the air-bladder simple and the pectoral fin as long as the ventrals. In the southern fish (*atrarius*) the air bladder is sacculated and the pectoral longer than the ventral. We have been unable to verify these differences and doubt their permanence. There are, however, marked sexual differences in the adult fishes, the male having the fin rays more prolonged and the form of body different.

The specimens before us are from Wood's Holl, Beaufort, Charleston, and St. Augustine.

The type of *Centropristes rufus* has been examined by us in the museum at Paris. It is probably an ordinary *striatus*, with the caudal fin somewhat mutilated, and it very likely came from New York rather than from Martinique.

Labrus striatus Linnæus, with D. X, 11; A. III, 8, with the dorsal spines "ramentaceous," and the body marked with lines alternately brown and white, must have been the young of some *Centropristis*, in all probability of the present species.

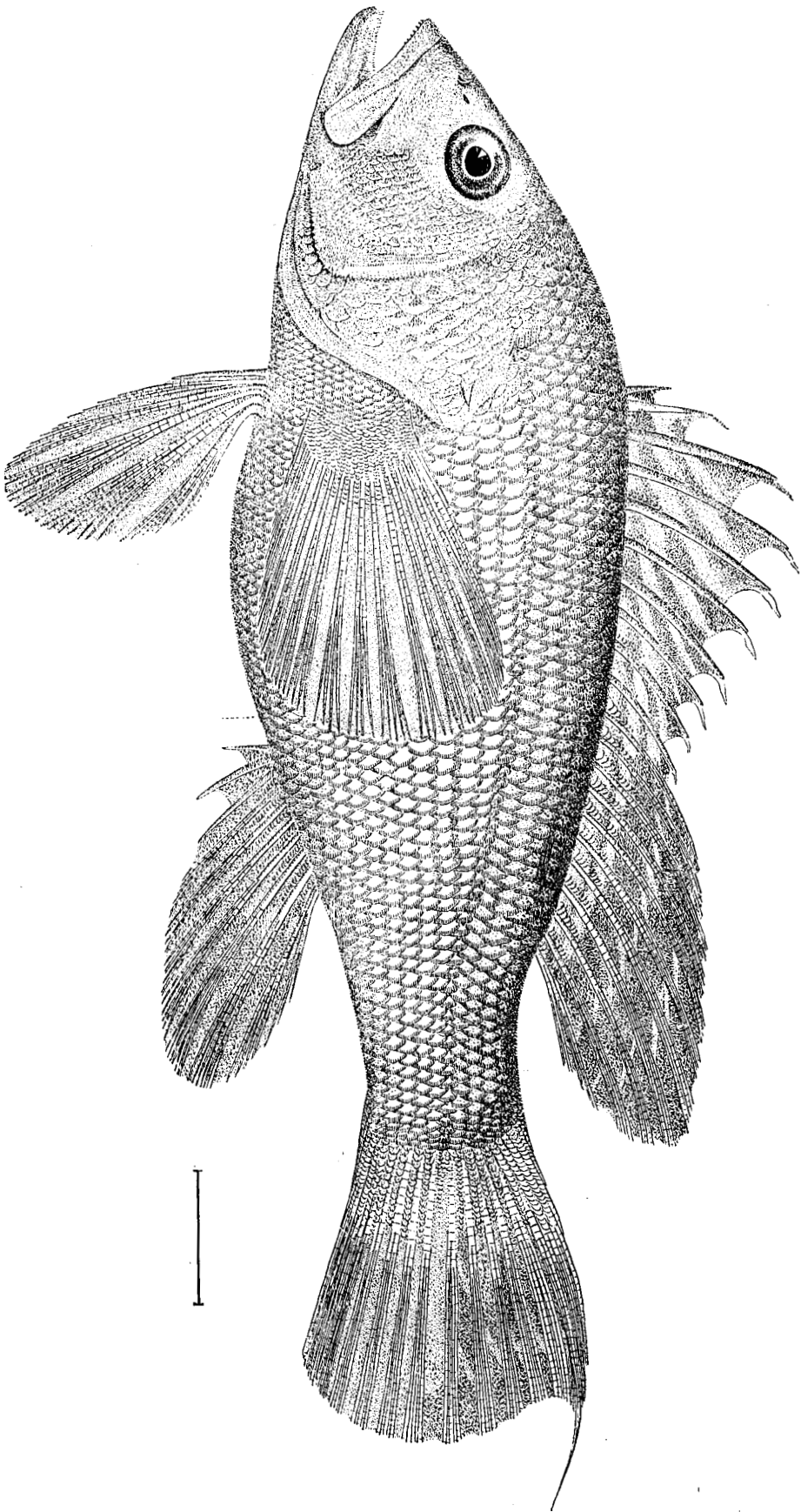
The name *striatus*, being given in the tenth edition of the Systema Naturæ, has priority over *atrarius*.

73. CENTROPRISTIS OCYURUS.

Serranus trifurcus Goode & Bean, Proc. U. S. Nat. Mus., 238, 1882 (Gulf of Mexico); Jordan & Gilbert, Proc. U. S. Nat. Mus., 273, 1882 (Pensacola); Jordan & Gilbert, Proc. U. S. Nat. Mus., 307, 1882 (Gulf of Mexico); Jordan & Gilbert, Synopsis, 917 (Gulf of Mexico) (not *Perca trifurca* L.)

Serranus philadelphicus Jordan & Gilbert, Proc. U. S. Nat. Mus., 143, 1883 (Pensacola) (not type).

Serranus ocyurus Jordan & Evermann, Proc. U. S. Nat. Mus., 468, 1886 (Pensacola).



CENTROPRISTIS STRIATUS (Linnæus). The Sea Bass.

(No. 14838, U. S. National Museum; from Noank, Connecticut.)

Habitat.—Gulf of Mexico, north to Pensacola.
Etymology.—Ὠκύς, swift; οὐρά, tail.

The specimens examined by us are from Pensacola, Fla. This species is very closely related to *C. striatus*, from which it differs in coloration, and in the great elongation of the dorsal and caudal rays. These characters are, however, little marked in the young. The species is scarce in the Gulf, all the known specimens having been procured in deep water by Mr. Silas Stearns. It may prove to be merely a deep-water variety of *C. striatus*.

74. CENTROPRISTIS PHILADELPHICUS.

Perca philadelphica Linnæus, Syst. Nat., Ed. X, 291, 1758 (America); Linnæus, Syst. Nat., Ed. xii, 484, 1766; Gmelin, Syst. Nat., 1314, 1788 (copied).
Serranus philadelphicus Jordan & Gilbert, Proc. U. S. Nat. Mus., 600, 1882 (Charleston Harbor); Jordan, Proc. U. S. Nat. Mus., 39, 1884; Jordan, Cat. Fish. N. Am., 82, 1885.
Perca trifurca Linnæus, Syst. Nat., Ed. XII, 489, 1766 (Carolina); Gmelin, Syst. Nat., 1322, 1788 (Carolina.)
Centropristis trifurca Dekay, Report New York Fauna, Fish., 25, 1842 (South Carolina); Storer, Synopsis, 287, 1846 (South Carolina).
Centropristis trifurcus Holbrook, Ichth. S. Carolina, 49, 1860, pl. 7, fig. 1 (Charleston).
Anthias trifurcus Günther, Cat. Fish. Brit. Mus., I, 91, 1859 (copied).
Serranus trifurcus Jordan & Gilbert, Synopsis Fish. N. Am., 534, 1883; Goode, Nat. Hist. Aquat. An., 410, 1886 (Charleston).
Lutjanus tridens, Lacépède, Hist. Nat. Poiss., IV, 246, 1802 (Carolina).
Centropristis tridens Cuv. & Val., Hist. Nat. Poiss., III, 43, 1829 (Carolina).

Habitat.—South Atlantic coast of United States (not known from the Gulf of Mexico, all the references from that region belonging to *Centropristes ocyurus*).
Etymology.—*Philadelphicus*, from the city of Philadelphia, where the species is not found.

This species, like its relative, *C. ocyurus*, inhabits rather deep water, and is consequently less frequently seen than the common Sea-bass. Our specimens are from Charleston, S. C.

Genus XVIII.—CRATINUS.

Cratinus Steindachner, Ichthyol. Beiträge, VII, 19, 1878 (*agassizii*).

TYPE.—*Cratinus agassizii* Steindachner.
Etymology.—Name unexplained; perhaps a diminutive of *crates*, a bundle of rods.

This genus is related to *Paralabrax* and *Prionodes*, differing in the form of the head and in the prolongation of most of its dorsal spines, which are attenuated into filaments, without dermal appendage. One species is known, a fish with a very peculiar physiognomy.

ANALYSIS OF SPECIES OF CRATINUS.

a. Body subfusiform, moderately compressed, the head long and low, the anterior profile gently curved; snout very long, 2⅔ in head; eye moderate, 7 to 8 in head; head mostly scaled above and on sides; the scales on preorbital and cheeks very small and close set; jaws naked; interopercle scaly; preorbital very deep, its least depth 5 to 6 in head; mouth very large, the maxillary 2⅓ in head, reaching middle of pupil; lower jaw much projecting; teeth moderate; nostrils oval, subequal, near together; opercular spines obscure; scales on opercles large, their bases covered with small scales; preopercle finely serrate on the rounded posterior limb

only; gill-rakers moderate, rather slender; third to sixth dorsal spines greatly produced, extending far beyond the membrane; the fourth highest, more than one-third length of body; first and second spines very short; soft dorsal naked; caudal fin slightly lunate, about half as long as head; ventral shorter than pectoral, which is $2\frac{1}{3}$ in head; color greenish gray above, with darker clouds or obscure cross-bands, which disappear in spirits. Head $2\frac{1}{4}$ in length; depth $3\frac{3}{4}$ to 4. D. X, 12; A. III, 7. Scales, 9–63–22.....AGASSIZII, 75.

75. CRATINUS AGASSIZII.

Cratinus agassizii Steindachner, Ichth., Beitr., VII, 19 (Galapagos Islands).

Habitat.—Galapagos Archipelago.
Etymology.—Named for Louis Agassiz.

We have examined two specimens of this singular species, collected by the *Albatross* at Charles Island, one of the Galapagos. The largest is about 18 inches long. The posterior half of the body resembles that of the species of *Paralabrax;* the long, low head suggests *Philypnus.*

Genus XIX.—DULES.

Dules Cuvier, Règne Animal, Ed. II, 1829 (*auriga*).

TYPE.—*Dules auriga* Cuv. & Val.

*Etymology.** Δοῦλος, a slave, the fish being under the lash of the long dorsal spine.

This genus contains but a single known species. It is very close to *Prionodes*, from which it differs in the presence of but six branchiostegals, and in the whip-like prolongation of the dorsal spine. It also bears considerable resemblance to *Centropristis.* Most of the species referred by Cuvier and Valenciennes to *Dules* belong to the genus *Kuhlia* Gill (= *Moronopsis* Gill = *Paradules* Bleeker).

ANALYSIS OF SPECIES OF DULES.

a. General form of *Centropristis;* branchiostegals 6, the first being obsolete; body rather deep and compressed, somewhat as in *Hypoplectrus*, but less deep; anterior profile steep and nearly straight; mouth rather small, the lower jaw protruding; preorbital rather narrow, as broad as pupil; top of head naked; the frontal area large and well defined, broader than long; occipital crest low and short, shorter than the frontal area, the cranium much as in *Paracentropristis hepatus;* teeth small, with no marked canines; gill-rakers rather short and slender, x + 9; maxillary $2\frac{2}{3}$ in head; eye $3\frac{1}{2}$; snout 4. Scales large, those above in series parallel with the lateral line; scales on breast small; third dorsal spine extremely long, reaching beyond middle of soft dorsal; other spines all short and even; soft dorsal moderate, a little scaly at base; dorsal not notched; caudal truncate; second anal spine $2\frac{5}{6}$ in head, as long as third, and a little stouter; pectoral $1\frac{9}{10}$ in head. Coloration in spirits, brownish; a dark area from front of anal up to soft dorsal; before this a whitish area, upper parts with dark streaks along the rows of scales, these faint and not continuous; a dark band upward from middle of base of ventrals; fins clouded. Head, $2\frac{2}{3}$ in length; depth, $2\frac{1}{3}$. D. X, 13; A. III, 7. Scales, 49.....AURIGA, 76.

* Par ce nom de doules (*esclave*) nous avons voulu indiquer la ressemblance de ces poissons avec ceux que depuis longtemps nous avons appelés *thérapons*, nom qui lui-même, assez arbitraire, n'est que la traduction de l'épithète donnée à l'espèce de thérapon décrite le plus anciennement (*l'Holocentrus servus* de Bloch).—CUV. & VAL., III, 111.

76. DULES AURIGA.

Dules auriga Cuv. & Val., Hist. Nat. Poiss., III, 112, 1829, pl. 51 (Brazil); Dekay, New York Fauna, Fishes, 1842, 34, pl. 10, f. 34 (New York—probably an error); Jenyns, Zool. Beagle, Fishes, 1840, 16 (Maldonado Bay, Rio Plata); Castelnau, Anim. Nouv. ou rares Amér. Sud, 1855, 6 (Rio Janeiro); Günther, I, 266 (Bahia); Jordan & Gilbert, Synopsis N. A. Fishes, 1883, 542 (description from the original type); Jordan, Proc. Ac. Nat. Sci. Phila., 1884, 98.

Habitat.—Coast of Brazil.

Etymology.—*Auriga*, a coachman, from the whiplike dorsal spine.

Our account of this species is taken from several specimens (4531, M. C. Z.), the longest about 5½ inches long, collected by Professor Agassiz at Rio de Janeiro. The species seems to be not rare on the Bazilian coast, but there is no evidence of its occurrence in the West Indies or northward.

Genus XX.—PARACENTROPRISTIS.

Paracentropristis Klunzinger, Fische des Rothen Meeres, 1884, 16 (*hepatus*).

TYPE.—*Labrus hepatus* Linnæus.

Etymology.—*Παρά*, near; *Centropristis*, an allied genus.

This genus contains a single species, found in the waters of southern Europe. It is like *Prionodes* in many respects, but it has the top of the head closely scaled, a character very unusual among the *Serraninæ*.

Closely allied to *Paracentropristis* is the Japanese species *Centropristis hirundinaceus* C. & V., but as this species has the caudal deeply forked, it will probably prove to be the type of a distinct section or genus.

ANALYSIS OF SPECIES OF PARACENTROPRISTIS.

a. Top of head closely scaled, as far forward as front of eyes; caudal fin very slightly lunate; scales large, about 50 in the lateral line; body rather deep, little compressed, dorsal outline from snout to end of dorsal forming an even curve; eyes large, longer than snout, 3¼ in head; mouth large, the maxillary reaching middle of eye; nine rows of scales on cheek; gill-rakers moderate, about x + 13; lower jaw slightly projecting; fourth dorsal spine highest, 2¼ in head; second anal spine higher than third, 3 in head; pectorals long, reaching front of anal. Color pinkish with about five dark cross-bars, the fourth Y-shaped; ventrals and base of anal blackish; a jet-black spot on soft dorsal in front; fins otherwise pale, with faint dark markings. Head, 2¾ in length; depth, 3. D. X, 12; A. III, 7. Scales, 5–48–15 ..... HEPATUS, 77.

77. PARACENTROPRISTIS HEPATUS.

(SACCHETTO.)

Labrus maxilla inferiore longiore, etc., Artedi, Genera, 35, 1738.

Labrus hepatus Linnæus, Syst. Nat. X, 282, 1758 (after Artedi); Linnæus, Syst. Nat., Ed. XII, 474, 1766 (and of the various copyists).

Holocentrus hepatus Risso, Ichthyol., Nice, 292, 1810.

Serranus hepatus Cuv. & Val., Hist. Nat. Poiss., II, 231, 1828 (Naples); Guichenot, Explor. Sc. Algér., Poiss., 34, 1850 (and of most recent writers).

Centropristis hepatus Günther, Cat. Fish. Brit. Mus., I, 84, 1859.

Labrus adriaticus Gmelin, Syst. Nat., 1297, 1788 (Adriatic Sea) (after Brünnich, p. 98).

Labrus fuscovittatus Bonnaterre, Encycl. Méth., 110, 1788 (after Brünnich).

Holocentrus striatus Bloch, Ichthyologia, t. 235, fig. 1, 1790.

Labrus fasciatus Walbaum, Artedi, Piscium, 1792, 265 (after Brünnich, p. 98).
Labrus spalatensis Bloch & Schneider, Syst. Ich., 1801, 256 (after Brünnich).
Holocentrus triacanthus Lacépède, Hist. Nat. Poiss., IV, 376, 1803.
Holocentrus signonotus De la Roche, "Ann. Mus., XIII, 352, pl. 22, fig. 8, 1809."

Habitat.—Mediterranean Sea.

Etymology.—Ἤπατος (from ἧπαρ, liver), a name used by Aristotle to designate some sort of fish, probably the haddock.

This little fish is abundant in the Mediterranean and adjacent waters. Our specimens are from Palermo and Venice.

The relationships of this species seem to be with the American species of "*Prionodes.*" Dr. Günther refers all these species to *Centropristis.* They agree with the latter genus in the short soft dorsal and in the moderate size of the canines. The skull is, however, notably different from that of *C. striatus*, and similar to that of *Serranus scriba.*

Genus XXII.—DIPLECTRUM.

Diplectrum Holbrook, Ichthyology of South Carolina, Ed. 1, 32, 1856 (*fasciculare* = *formosus*).
Haliperca Gill, Proc. Ac. Nat. Sci. Phila., 1862, 236 (*bivittatus* = *radialis*) and other species. Restricted to *bivittatus* by Jordan & Gilbert, Synopsis, 535).

TYPE.—*Serranus fasciculare* Cuv. & Val. = *Perca formosa* Linnæus.

Etymology.—Δίς, two; πλῆκτρον, spur.

This genus is very close to *Serranus*, from which it differs chiefly in the armature of the preopercle. This character is little marked in young examples, which agree essentially with *Prionodes* in generic characters.

Five species are now known, two of them with many synonyms.

ANALYSIS OF SPECIES OF DIPLECTRUM.

a. Preopercle with two clusters of divergent spines, the one at the angle, the other higher (the two fascicles well separated in the adult, but smaller and coalescent in the young) (*Diplectrum*).

b. Head and body marked with many interrupted blue lines; body elongate, the profile strongly arched above eyes; mouth large, lower jaw slightly projecting; maxillary narrow, reaching middle of eye, 2⅔ in head; canine teeth small; eye placed high, shorter than snout, about 5 in head; preorbital broad, more than twice the width of maxillary; upper part of margin of preopercle finely serrate; lower half with strong, straight spines diverging from two centers; gill-rakers short and small, x+9; top of head and preorbital region naked; smooth area on top of cranium very convex; eleven rows of scales on cheeks; fins, except caudal, scaleless; dorsal spines low and slender, the first three graduated, the rest subequal; caudal deeply lunate, the upper lobe the longer, sometimes ending in a long filament; anal spines very weak, the third longest, 1⅓ in eye. Pectoral, 1⅔ in head. Color brownish, silvery below; sides with seven or eight longitudinal deep-blue lines and about as many dark cross-bars, the last bar forming a large black blotch at upper base of caudal; young with two broad, dusky longitudinal stripes, which become interrupted with age; three or four distinct blue stripes on sides of top of head; two across preorbital, the lower forked; fins with narrow, wavy bars of blue and pale yellow. Head, 3 in length; depth, 3⅔. D. X, 12; A. III, 7. Scales, 9-68-18 ..... FORMOSUM, 78.

aa. Preopercle with a single center of divergence of the spinules about its angle (in the adult as well as in the young) (*Haliperca* Gill).

b. Spines on produced portion of preopercle numerous, 8 to 20 in number; outline of the spinous dorsal fin somewhat convex, so that the fin is more deeply notched than in *D. formosum*; jaws equal; vertex naked; opercle black within.

c. Produced part of preopercle very broad, its (vertical) breadth about one-third length of head to end of opercular spine; gill-rakers, x + 12; eye and head about as in *D. radiale;* longest dorsal spine 3 in head; scales smaller than in *D. macropoma;* six or seven rather irregular rows on cheek. Color dull brownish, with four or five vague, dusky cross-bars, and a large dark spot at base of caudal; snout and preorbital with vague, pale blotches; base of soft dorsal, blackish; fins without blue spots; dorsal plain; caudal with an oblique white tip to each lobe; ventrals black. Head, 2⅔; depth, 3½. D. X, 12; A. III 8. Scales, 7-54-18. Eye, 4 in head. Snout, 3¾ ..... EURYPLECTRUM, 79.

cc. Produced portion of preopercle not very broad; its (vertical) breadth not more than one-fourth length of head.

d. Scales on cheek large and irregular, in five or six rows; width of preopercular process about one-fourth head; its posterior edge truncated; general form of body and head essentially as in *D. radiale; gill-rakers* x + 10; *longest* dorsal spine 2¾ in head. Coloration (like other characters) intermediate between *D. euryplectrum* and *D. radiale;* brownish, with numerous traces of vague, dark cross-bars; a very distinct black caudal spot; snout with four or five pale blotches; a pale streak from below eye across preopercular angle; no black at base of soft dorsal; the fin with very faint traces of blue spots; caudal plain, darker toward tip; ventrals pale. Head, 3⅓; depth, 3⅓. D. X, 12; A. III, 7. Scales, 5-48-14. Snout, 4 in head. Eye, 4 ..... MACROPOMA, 80.

dd. Scales on cheeks small and regularly placed in about ten rows; width of preopercular process 4½ to 5 in head, its posterior edge rounded; gill-rakers x + 10, short and slender, well separated; region above the large eye prominent; snout short, bluntish; cheeks with ten rows of scales; these regularly placed; serræ on preopercle much produced in the adult; short in the young; upper lobe of caudal little produced; longest dorsal spine 2¾ in head. Body light brown above, dull yellowish below; the scales on sides each with a silvery center; irregular, vague, dark cross-bars, broader than the interspaces; a black bar at base of caudal; usually no blue lines or white areas on head; soft dorsal with bright blue spots, each surrounded by a dark blue ring; caudal with bars of similar spots; young with two black longitudinal stripes, the lower forming a spot at base of caudal. D. X, 12; A. III, 7. Scales, 8-51-20 ..... RADIALE, 81.

bb. [Spines at angle of preopercle about four in number; scales small; color uniform brown, without bands or spots; brown on the back, silvery below; spinous dorsal marbled with violet; soft dorsal obliquely striped with violet and yellow; caudal immaculate; ventrals blackish. D. X, 12; A. III, 6.] (Cuv. & Val.) ..... CONCEPTIONE, 82.

78. DIPLECTRUM FORMOSUM.

(SQUIRREL-FISH; SERRANO.)

Perca formosa Linnæus, Syst. Nat., Ed. XII, 488, 1766 (Carolina); Gmelin, Syst. Nat., 1322, 1788 (copied); and of the copyists; partly confused with *Hæmulon plumieri,* to which species some of the early references belong.

Serranus formosus Jordan, Proc. U. S. Nat. Mus., 35, 1884 (Pensacola); Jordan, Proc. U. S. Nat. Mus., 39, 1884 (Pensacola); Jordan, Proc. U. S. Nat. Mus., 125, 1884 (Key West); Jordan, Cat. Fish. N. Am., 82, 1885; Jordan, Proc. U. S. Nat. Mus., 1886, 39 (Havana).

Serranus radians Quoy & Gaimard, Voy. de l'Uranie, Poiss., 313, tab. 58, fig. 2, 1824.

Centropristis radians Günther, Cat. Fish. Brit. Mus., I, 83, 1859 (Brazil; Montevideo).

Diplectrum radians Poey, Ann. Lyc. Nat. Hist., 34, 1871 (Cuba); Poey, Enumeratio, 23, 1875.

Serranus irradians Cuv. & Val., Hist. Nat. Poiss., II, 244, 1828 (Montevideo).

Serranus fasciolaris Cuv. & Val., Hist. Nat. Poiss., II, 245, pl. 30, 1828 (Brazil); Cuv. & Val., Hist. Nat. Poiss., IX, 431, 1833 (Charleston); Cuvier, Règne Animal, 1829; Storer, Synopsis, 280, 1846 (copied); Jordan & Gilbert, Synopsis Fish. N. Am., 534, 1883; Jordan & Gilbert, Proc. U. S. Nat. Mus., 273, 1882 (Pensacola).

Centropristis fasciolaris Günther, Cat. Fish. Brit. Mus., I, 83, 1859 (Brazil; Charleston).

Diplectrum fasciolare Holbrook, Ichth. S. Carolina, 1860 (Charleston); Poey, Repert., I, 195, 1867; Poey, Synopsis, 282, 1868 (Havana); *Gill, Cat. Fish. East Coast N. Am.,* 28, 1873.

Habitat.—West Indian fauna; north to Charleston, south to Montevideo.
Etymology.—*Formosus*, handsome.

This handsome fish is common on the south Atlantic and Gulf coasts of the United States on rocky bottoms at a moderate depth. It reaches a length of little more than a foot.

We have examined specimens from Charleston, Pensacola, Key West, Captiva Key, Havana, Pernambuco, and Rio Janeiro. These specimens show no evident specific differences; but the differences due to age are somewhat considerable. The smallest specimens before us (2 inches long) have a very distinct dark lateral band running from the tip of the snout and ending in a dark spot at the upper base of caudal fin; another (paler) band runs from upper part of eye to base of last dorsal rays; another from above eye along base of dorsal. These bands are sharply defined in the young, and traces of them are usually found in all examples. In the smallest specimens the preopercle is simply but coarsely serrate with a salient angle; in larger ones a portion of the preopercle is prolonged backwards and its spines begin to radiate. In examples of 4 inches the spines are not yet divided into two fasciæ, but later they begin to show radiation from two distinct centers. In specimens of 7½ inches the two fascicles of spines are distinct. In the largest the upper lobe of the caudal is filamentous.

We adopt the name *formosus* for this species, as it is evidently the original *Perca formosa* of Linnæus, sent from Charleston by Dr. Garden.

79. DIPLECTRUM EURYPLECTRUM.

Diplectrum eurypleetrum Jordan & Bollman, Proc. U. S. Nat. Mus., 1889, 157 (Sea between Panama and Galapagos Islands).

Habitat.—Pacific coast of South America.
Etymology.—*Εὐρύς*, wide; *πλήκτρον*, spur.

This species is known from numerous specimens dredged by the *Albatross* at a depth of about 35 fathoms. It is found in company with *D. macropoma*, a species which it closely resembles, and into which it may possibly be found to intergrade.

80. DIPLECTRUM MACROPOMA.

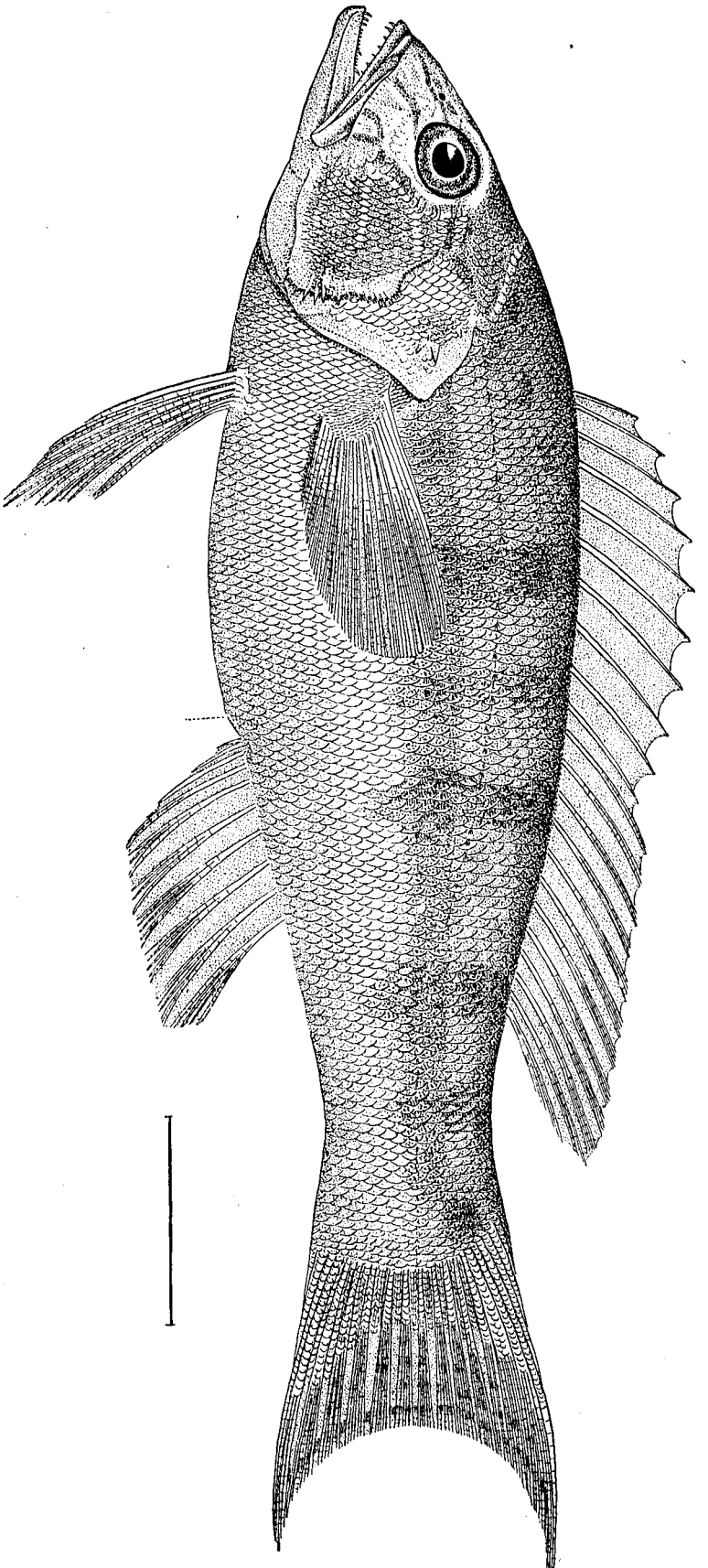
Centropristis macropoma Günther, Proc. Zool. Soc. London, 145, 1864 (Panama); Günther, Fish. Central Amer., 409, pl. LXV, 1869 (Panama).
Diplectrum macropoma Jordan & Bollman, Proc. U. S. Nat. Mus., 1889, 157 (Panama and southward).

Habitat.—Pacific coast of tropical America.
Etymology.—*Μακρός*, large; *πῶμα*, opercle.

This species, hitherto known from a single young example which we had supposed to be the young of *D. radiale*, was obtained in abundance by the *Albatross* with the preceding in the sea south of Panama. A few specimens were also taken at Panama.

81. DIPLECTRUM RADIALE.

Serranus radialis Quoy & Gaimard, Voyage Uranie, 316,1824 (Rio Janeiro); Cuv. & Val., Hist. Nat. Poiss., II, 243, 1828 (Rio Janeiro); Cuvier, Règne Animal, 1829 (name only); Jordan, Cat. Fish. N. Am. 82, 1885; Jordan, Proc. U. S. Nat. Mus., 376, 1885 (Gulf of California; Panama).
Centropristis radialis Günther, Cat. Fish. Brit. Mus., I, 83, 1859 (Bahia); Steindachner, Ichth. Beiträge, IV, 6, 1875 (Brazil).



DIPLECTRUM FORMOSUM (Linnæus). The Squirrel-fish.

(No. 12548, U. S. National Museum; from Charleston, South Carolina.)

Diplectrum radiale Streets, Bull. U. S. Nat. Mus., VII, 1877; Jordan, Proc. U. S. Nat. Mus., 1889, 181 (Panama).

Serranus bivittatus Cuv. & Val., Hist. Nat. Poiss., II, 241, 1828 (Martinique); Storer, Synop. Fish. N. Am., 279, 1846 (copied).

Centropristis bivittatus Günther, Cat. Fish. Brit. Mus., I, 82, 1859 (Martinique; Cuba).

Haliperca bivittata Poey, Synop. Pisc. Cubens., 282, 1868 (Havana); Poey, Enumeratio, 22, 1875 (Havana).

Centropristes ayresi Steindachner, Ichth. Notizen, VII, 1, 1868, Taf. I, fig. 1 (Santos).

Habitat.—Both coasts of tropical America.

Etymology.—*Radialis*, radiant, from the radiating preopercular spines.

Dr. Steindachner has already noted the identity of his *Centropristes ayresi* from Santos, Brazil, with *Diplectrum radiale*. With Dr. Steindachner we find no difference between Atlantic and Pacific examples, although the other Pacific species, *D. macropoma*, seems to be a peculiar form.

It seems evident that the *Serranus bivittatus* is merely the young of this species. Specimens sent to us from Cuba by Poey confirm this supposition, as they differ from *radiale* precisely as the young differs from the adult in *formosum*.

We have examined specimens of *Diplectrum radiale* from Guaymas, Panama, Sambaia, Rio Janeiro, and Havana.

82. DIPLECTRUM CONCEPTIONE.

Serranus conceptionis Cuv. & Val., II, 246, 1828 (Concepcion de Chile); Lesson, "Voyage Coquille, Zool., II, 236;" Gay, Hist. Chile, Zool., II, 148; Günther, I, 84.

Habitat.—Coast of Chili.

Etymology.—From Concepcion de Chile, where the species was first found.

We know this species from the account given by Cuvier and Valenciennes of a specimen 4½ inches long. It seems to be a *Diplectrum*, and it is doubtless distinct from *D. radiale*, its nearest relative.

Genus XXII.—SERRANUS.

Serranus Cuvier, Règne Animal, Ed. I, 1817, 276 (based especially on the "Serran" or "Perche de mer" of the coasts of the Mediterranean).

Serranus Cuvier, Règne Animal, Ed. II, 1829 (*cabrilla*, "le Serran proprement dit").

Prionodes Jenyns, Voyage Beagle, Fishes, 1840, 46 (*fasciatus=psittacinus*).

Haliperca Gill, Proc. Ac. Nat. Sci. Phila., 1862, 236, in part (*bivittatus=radialis*).

Mentiperca Gill, Proc. Ac. Nat. Sci. Phila., 1862, 236 (*luciopercanus*).

Pseudoserranus Klunzinger, Synopsis der Fische des Rothen Meeres, 687, 1870 (in part, not type, which is *Variola louti*).

Serranellus Jordan, subgenus nova (*scriba*).

TYPE.—*Perca cabrilla* Linnæus.

Etymology.—*Serran*, the French name of *Serranus cabrilla* and related species.

The genus *Serranus* as defined in this paper contains numerous species, mostly of the New World, and representing a considerable variety of forms.

To this genus, however, belong but a small portion of the species called *Serranus* by Günther, and the writers who have followed his arrangement, in which nearly all the *Epinephelinæ* are referred to this very different genus. On the other hand, most of the species called *Centropristis* by these authors are either near allies of *Serranus cabrilla*, or else members of the very different subfamily *Lutjaninæ*. Few European

writers except Bleeker, Vaillant, Klunzinger, and Doderlein have recognized the wide divergence of *Serranus* and *Epinephelus*. Bleeker, who saw this clearly, properly retained the name *Serranus* for its original type and retained the old name *Epinephelus* for the group to which it was first given. Doderlein, for no obvious reason, substitutes the later name *Cerna* for *Epinephelus*, while Klunzinger perversely and needlessly changes these names about, calling the *Epinepheli* "*Serranus*" and making a new name for *Serranus*.*

Under *Serranus* we recognize several subgenera of more or less importance, some of which have been often regarded as distinct genera. Of these, *Prionodes* contains most species, American species, with shorter fins and smaller teeth, being weaker representatives of the European *Serranellus*. The two European species *scriba* and *cabrilla* differ considerably in the position of the lateral line, the latter species diverging from the usual Serranine type and approaching the *Anthiinæ*. The greater number of gill-rakers is also an indication of the same kind. In view of this difference, I have proposed a new subgeneric name for the type of *Serranus scriba*.

ANALYSIS OF SPECIES OF SERRANUS.

I. Dorsal fin rather short, its rays X, 11, or X, 12; canine teeth moderate or small; dorsal fin with few scales or none; species of small size, American.

a. Caudal fin truncate.

b. Scales large, 42 to 50 in the course of the lateral line; second anal spine considerably longer than third, about 2¼ in head. Body deep, compressed, the head comparatively slender, the anterior profile straight or somewhat concave; lower jaw little projecting; maxillary reaching beyond middle of eye, 2¼ in head; canines small, those on sides of lower jaw largest; preopercle rounded, subequally serrate; gill-rakers short and few, 6 or 8 in number; dorsal fin little emarginate, the fourth spine 3 in head; jaws scaleless; soft dorsal with small scales; pectoral long, reaching anal; color brown, with darker cross-shades; soft dorsal, anal and caudal fins checkered with blackish on a white ground; a broad white area or bar before anal fin.

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*Dr. Klunzinger remarks: "Bleeker nennt die *Serranus* jetzt *Epinephelus*. Diese Sucht, alte Namen hervorzusuchen, halte ich für verfehlt, wenigstens in Fällen, wie hier. Bloch hat allerdings verschiedene Arten dieser Gattung unter *Epinephelus* aufgeführt, die Gattungsdiagnose ist aber nichtssagend: Bloch hat die *Serranus*-Arten in viele Gattungen vertheilt, wie *Holocentrus*, *Johnius*, *Cephalopholis*, *Perca*, *u. s. w.* In den Regeln zoologischer Nomenclatur, wie die von der British Association 1865 und 1869 adoptirt wurden, heisst es in § 12: ein Name, welcher nie deutlich definirt wurde, sollte in den Namen ungeändert werden, welcher den Gegenstand zuerst deutlich bezeichnet. Dieser Regel folge ich."

Dr. Klunzinger forgets that *Serranus* was originally based on "le serran proprement dit"—that is, on *Serranus cabrilla*. If the clumsily constructed *Epinephelus* of Bloch is unsatisfactory to him, he has still the correctly defined *Epinephelus* of Bleeker. Even should he reject the name *Epinephelus* as wrong in meaning, the synonyms *Cerna* and *Merus* were both prior to his arrangement.

No writers have done so much to promote confusion in nomenclature as those who disregard the law of priority whenever the dictates of this law are opposed to their own whims. We find no excuse for the introduction of the name *Pseudoserranus* as a division of *Serranus*, when the author of the name knew that both groups had been named and defined long before.

Dr. Klunzinger seems to have wholly misunderstood the affinities of *Centropristis*. This genus, which is indistinguishable from his *Pseudoserranus*, he places in the neighborhood of *Mesoprion* (*Lutjanus*). He then divides *Centropristis* into three subgenera: *Centropristis* (*atrarius*), *Paracentropristis* (*hepatus*), and *Aprion* (*virescens*). The genus *Aprion* has no sort of affinity with *Centropristis*, and it does not belong to the *Serranidæ*. It belongs with *Lutjanus*, *Apsilus*, and *Etelis*, among or near to the *Sparidæ*.

c. Dorsal rays X, 13; head acuminate, at least in young; pectoral fin finely barred with black and whitish, precisely like the caudal fin; a very conspicuous inky-black blotch on front of soft dorsal (*at least in young specimens*), this being a continuation of one of the bars on the body; a black ring about tail at base of caudal, before which are six or seven dark bars, becoming progressively broader and fainter forwards; lower parts of head with a conspicuous net-work of dark streaks. Head, 2½; depth, 3. D. X, 13; A. III, 7. Scales, 6–45–17 (probably young of the next).....SUBLIGARIUS, 83.

cc. Dorsal rays X, 12; head less slender; pectorals red; inky-black spot on front of soft dorsal *small or obsolete*; dusky bars on body more distinct than in *S. subligarius*, the bar at base of caudal broken into two or three dark spots; a dusky bar behind pale bar in front of anal. Head, 2⅔; depth, 2⅔. D. X, 12; A. III, 7. Scales, 5–45–14..FLAVIVENTRIS, 84.

bb. [Scales small, about 60 in the lateral line; margin of preopercle rounded, without stronger spines at the angle. Color reddish, with two incomplete black rings behind the eye, with a large saddle-shaped black blotch on the back of the trunk and with some small black dots on the dorsal and caudal fins. D. X, 12; A. III, 7.] (Günther.)..ANNULARIS, 85.

aa. Caudal lunate or forked.

c. Scales large, 45 to 55 in the course of the lateral line. (*Prionodes* Jenyns.)

d. Opercle with a large inky blotch *within, which extends also on the membranes of the* shoulder-girdle; preorbital and maxillary narrow, the latter 2⅔ in head; teeth small; eye large, 3 in head, longer than the short snout, which is 4½ in head; dorsal spines rather high, not filamentous; soft dorsal not scaly; a notch between spinous and soft parts of dorsal; caudal well forked; second anal spine small, but longer than third, 3½ in head; scales large and regular. Head 3 in length; depth 3. D. X, 12; A. II, 7. Scales 3–47–11; sides with six dark vertical bars, the second extending as a jet-black blotch on the spinous dorsal from the fourth to the ninth spine; a paler bar before anal; fins mostly pale.....ATROBRANCHUS, 86.

dd. Opercular black blotch, *if present, not extending on shoulder-girdle.*

e. Scales on cheek very large in about five series; dorsal spines not quite equal; the fourth longest, about twice length of the ninth.

x. Teeth of jaws unusually small, the canines scarcely differentiated; lower teeth in one series; body slender, the head long; lower jaw little projecting; mouth large, the maxillary 2⅓ in head; eye large, as long as snout, 4½ in head; interorbital space flat, its width three-fifths orbit; preorbital narrow, one-fourth eye; angle of preopercle slightly *projecting*, the vertical margin gently concave, the serræ minute and equal; opercle produced backwards, with a single spine; gill-rakers long and slender, x + 16, the longest half eye; dorsal spines weak, flexible, low, the fourth *longest*, 3½ *in* head; *the ninth 7 in* head; caudal deeply lunate; anal not rounded, its spines slender, graduated; ventrals half head; pectorals long and narrow, reaching front of anal; scales large, ctenoid; scales on opercles large; top of head scaled forwards to posterior margin of pupil; dorsal and anal scaleless; dusky brownish, paler below, a series of about seven ill-defined, dusky blotches along lateral line; from these, still fainter bars run downwards; lining of opercle largely black, this appearing *externally as a dusky blotch*; vertical fins transparent, with minute dark specks; ventrals with median rays black; peritoneum silver; no sharp markings on body or fins. Head, 2½ in length; depth, 3½. D. X, 12; A. III, 7. Scales, 4½–48–13.....*ÆQUIDENS*, 87.

xx. Teeth unusually strong, three or four on each side in upper jaw as large as the largest lateral teeth; eye very large, 2⅝ in head; maxillary 2⅓ in head; jaws equal; preorbital extremely narrow, not one-third width of pupil; preopercle very sharply serrate; gill-rakers short, slender, x + 10; scales very large, covering head forward to back of pupil; first dorsal spine short, second a little longer; fourth longest, 2⅓ in head; the rest gradually shortened, lower than the soft rays, which are scaleless; second anal spine 4 in head, as long as third and stouter; caudal forked. Color plain olivaceous; fins all pale; sides with about six faint dark cross-bands, more or less confluent along lateral line, and disappearing below. Head, 2⅔ in length; depth, 3⅓. D. X, 12; A. III, 7. Scales, 48.....FUSCULUS, 88.

ee. Scales on cheek moderate, in about eight series; body oblong, heavy anteriorly; dorsal outline a little elevated, the profile almost straight; eyes very large, as long as snout, 3⅓ in head, twice the concave interorbital space; top of head naked; lower jaw not projecting; canines small; mouth large, the maxillary reaching middle of eye; preorbital narrow; gill-rakers short, about x + 10; twelve rows of scales before dorsal; dorsal spines strong, the fourth highest, 2⅓ in head, a little longer than longest soft ray; dorsal fin not notched; soft dorsal a little scaly; caudal deeply lunate; second anal spine 3⅓ in head, stronger but scarcely longer than third spine; pectorals long, reaching anal. Color light brownish, with lighter blotches and faint dusky bars; a very conspicuous, sharply defined, vertical white bar extending upward on each side from just before vent; fins pale. Head, 2⅔ in length; depth, 3⅓. D. X, 12; A. III, 7. Scales, 5-53-15..PHŒBE, 89.

eee. Scales on the cheek small, in about twelve series; second anal spine about as long as fourth dorsal spine. Body oblong, not elevated; snout sharp; lower jaw much projecting, its tip entering the profile; maxillary reaching to beyond middle of eye; teeth rather strong, much as in *S. scriba;* gill-rakers short and few, x + 8. Dorsal continuous, the spines low, the longest 3 in head; second anal spine stronger than third, and about as long, 3 in head; last ray of anal longest, 1½ in head; caudal somewhat lunate, the outer rays slightly produced; pectoral 1½ in head; ventral 1⅞. Color light olivaceous, with twelve irregular, broad, dark brown bands extending to below the lateral line, appearing again at level of base of pectorals as a series of rounded blotches, those in front pinkish, those behind brown; a pale streak from nape to dorsal; two pale streaks or rows of blotches below this, extending from snout through eye and backward; a broad brown streak from eye to upper angle of opercle, this again bounded by a pale streak; suborbital light blue; a dark spot at base of ventrals, one or more below base of pectorals, and one in front of the latter; caudal dark brown at base and on outer rays; pink on inner rays, reticulated with irregular, narrow, light blue lines, these marks most distinct on outer rays; a large double blotch at base of caudal; anal and ventrals light glaucous blue, thickly marked with brownish yellow spots, the blue forming reticulations around the brown spots; spinous dorsal and base of soft dorsal dusky, upper part of soft dorsal sharply spotted with dark brown, the pale ground color forming reticulations around the dark spots. Head, 2⅝ in length; depth, 3⅓. D. X, 12; A. III, 7. Scales, 5-50-15.....PSITTACINUS, 90.

cc. Scales small, the lateral line with 60 to 75. *

g. Lower jaw not very strongly projecting.

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* Not described in *Serranus peruanus*, which presumably belongs to this group.

h. Body covered with irregular, inky-black spots and bands. Body long and low, the head low and sharp, the lower jaw projecting; scales small; top of head naked, the smooth area on frontal region large; scales on cheek small, in ten or twelve rows; preopercle rounded, with regular serræ; teeth small; gill-rakers very short, x + 6 to 8. Eye 4 in head; maxillary 2½, reaching to center of eye; soft dorsal and anal naked; dorsal low, not notched; caudal forked; second and third anal spines equal, the second the strongest, 2¼ in head; pectoral 1⅓ in head. Color brownish above, the sides yellowish, everywhere above, below, and on fins covered with irregular, inky-black spots, blotches, and bands, the latter meeting around the belly; pectorals and anal plain; a broad ring around base of caudal, and many irregular spots around bases of ventrals and pectorals; numerous black spots on dorsals and caudal, one of those on front of spinous dorsal very conspicuous. Head, 2⅝ in length; depth, 3⅗. D. X, 11; A. III, 7. Scales, 8-68-24 (60 pores).....TIGRINUS, 91.

hh. Body not covered with conspicuous, inky-black spots and bands.

i. Back with three or more large, conspicuous blotches of yellowish white. Body more elongate than in related species; profile slightly convex; interorbital space concave; eyes large, longer than snout, 3¼ in head; maxillary reaching middle of eye; lower jaw slightly projecting; scales on cheeks small, in eleven series; scales in front of dorsal small, crowded in twenty-five series; top of head naked; dorsal spines low, fifth the longest, 2¼ in head; caudal strongly lunate; anal spines graduated, the third 3⅓ in head; pectorals and ventrals short, not reaching vent. Color brownish red above, with areas of light yellow on sides of back; one before dorsal, a large one and a small one below spinous dorsal; a large one below last rays of soft dorsal; one on back of tail; yellow before eye; belly and lower parts light red; top of head with two pale cross-shades, one before, one behind eyes; lower fins light orange; caudal red with two conspicuous longitudinal stripes of blackish red; dorsal red-shaded, a maroon blotch on each part of it, extending upward from a similar blotch on the back. Head, 3 in length; depth, 3⅖. D. X, 12; A. III, 7. Scales, 11-73-25 .....TABACARIUS, 92.

ii. Back without conspicuous blotches of yellowish white.

j. [Coloration nearly uniform, the body elongate, without distinct bands or spots; snout short and thick; head flat above; preopercle finely serrate; scales small; top of head naked; caudal slightly lunate. Color brownish yellow on back, orange on sides, and brighter or red on belly; no spots nor bands; upper part of head bluish, the fins gray; caudal bordered above and below with brown. D. IX (X), 12; A. III, 7. Scales, 60 to 65.] (*Cuv. & Val.*)...FLAVESCENS, 93.

jj. [Coloration not uniform; reddish brown with a pale stripe along the lateral line; head, body, and sides silvery, with seven or eight large, round spots; dorsal yellowish, edged with red; caudal brownish; anal reddish brown, with two rounded, reddish brown spots. D. X, 12; A. III, 9. Scales and other characters undescribed.] (*Lesson.*) .PERUANUS, 94.

gg. Lower jaw very strongly projecting; body elongate, moderately compressed; scales small (about 70) (*Mentiperca* Gill).

k. [Snout blunt, scarcely longer than eye; caudal fin not banded; body rather deeper than in *S. luciopercanus*; dorsal fin low, rather deeply notched, the first and second spines low, the third highest; cauda. well forked; anal spines graduated; preopercle well serrated, the posterior margin vertical; color purplish above, yellowish below, the upper fins edged or tipped with orange yellow.] (*Castelnau.*) .....CASTELNAUI, 95

kk. Snout sharp, much longer than the large eye; preopercle finely denticulated; top of head with vertex naked; caudal deeply forked; skull depressed, with a single crest; dorsal spines moderate, the third highest.

l. Color red, with numerous inky-black spots on posterior half of body, most of them round, rather smaller than pupil, and ranged in irregular horizontal rows; a large quadrate blotch at front of soft dorsal, extending on the fin; dorsal with dark spots; lower half of caudal chiefly black; a large, oblong, silver-white blotch from before vent, extending obliquely upward and backward to near the black dorsal blotch. Head, 3 in length; depth, 3⅜. D. X, 12; A. III, 7. Scales, 8–65–18. Snout, 3¼ in head; maxillary, 2⅔. Eye, 4. Eleven rows of small scales on cheek; fourth dorsal spine 2½ in head; anal spines graduated, the second 3⅜ in head; pectorals 1⅓ in head; ventral 1⅜.....STILBOSTIGMA, 96.

ll. Color clear brown with larger darker spots or bars on the sides; fins pale, more or less tinged with orange. Head, 3 in length; depth, 3⅓. D. X, 12; A. III, 7. Scales, 7–70–20 .....LUCIOPERCANUS, 97.

II. Dorsal fin long, its rays X, 14 or X, 15; head acuminate, the lower jaw projecting; canine teeth strong, membrane of both dorsals scaly; scales small.

x. Lateral line as in other species of *Serranus*, not close to the back, on about the ninth row of scales; caudal subtruncate (*Serranellus* Jordan).

y. Scales moderate, about 73 in the lateral line; caudal fin truncate; lateral line not running near the back, not approaching nearer than about the ninth row of scales; anal spines graduated; top of head not scaly; *the skin rugose; body rather short, compressed, the back* a little elevated, the anteroir profile straight; head subconical, compressed, the snout acuminate; eye small, shorter than snout, 5 in head; mouth large, narrow, maxillary reaching *middle of* eye, 2⅔ in head; lower jaw projecting; teeth in narrow bands, the canines strong, recurved, two to four in front of each jaw on each side and several on side of lower jaw, the latter largest of all; gill-rakers few and short, about x + 8; scales on cheeks quite small, in fifteen to eighteen series, about twenty series before dorsal; preopercle rather finely serrate, the angle rounded; preorbital very narrow; first four dorsal spines graduated, the rest subequal, 2⅔ *in head; the dorsal fin not notched; soft* dorsal somewhat scaly; caudal obliquely subtruncate; the upper rays somewhat longer, the middle rays a little shortened; anal spines rather strong, graduated; pectorals long, reaching vent. Color olivaceous, the body with five to seven blackish cross-bands; two of these, under soft dorsal, very distinct; head with numerous wavy, blue lines; vertical fins vermiculated with bluish lines around small, round, reddish spots. Head 2⅔ in length; depth 3⅓. D. X, 14 or 15; A. III. 7. Scales, 8–73–27. SCRIBA, 98.

yy. Scales small, about 115 in the lateral line; snout scaleless, pointed, the lower jaw slightly prominent; the maxillary reaching beyond *middle of eye; eye 4½ in head, 1½ in snout;* interorbital space flat, narrow; serræ on angle of preopercle largest; caudal truncate; ventrals short. Color olive, with several dark cross-bands, most distinct on middle of side of body; two of them near middle of body darker and broader than the rest; three bluish, dark-edged streaks across cheeks* from eye to angle of preopercle; soft parts

*Es ist nicht *ein* dunkles Wangenband vorhanden (*Gthr.*), sondern bis drei, sie sind bläulich, schwarzgesäumte." (Hilgendorf.)

of vertical fins covered with very small bluish spots; angles of caudal jet-black. Head 3 in length; depth, 3⅓. D. X, 15; A. III, 8. Scales, 11-115-x.] (*Günther.*).....ATRICAUDA, 99.

xx. Lateral line running high anteriorly, somewhat as in the *Anthiinæ;* one about the fifth row of scales; caudal forked (*Serranus*).

z. Lateral line running very high, on the fourth or fifth row of scales from below fourth dorsal spine to end of dorsal fin; both dorsals and anal fin with small scales; body elongate, compressed; head acuminate, compressed, formed much as in *Serranus scriba*; lower jaw strongly projecting; anterior profile nearly straight; preopercle finely serrate, the angle salient and with larger teeth; top of head scaleless, the skin rugose; maxillary reaching past middle of eye, 2⅓ in head; canines strong; mouth rather oblique, lower jaw projecting; scales on cheek moderate, in about eleven series; anal spines graduated; pectorals rather long, 1⅔ in head; gill-rakers longer than in any other of the *Serraninæ*, about x + 15, the longest rather longer than pupil. Color orange-yellow; four or five gray longitudinal streaks across the head, about three of which usually extend along the body; body with dark cross-shades in the young; vertical fins with blue spots. Head, 3 in length; depth, 3⅓. D. X, 14; A. III, 7 or 8. Scales, 9-80 to 90-20 to 25.....CABRILLA, 100.

83. SERRANUS SUBLIGARIUS.

Centropristis subligarius Cope, Proc. Acad. Nat. Sci. Phil., 120, 1870 (Pensacola).

Serranus subligarius Goode & Bean, Proc. U. S. Nat. Mus., 238, 1882 (Gulf of Mexico); Jordan & Gilbert, Proc. U. S. Nat. Mus., 274, 1882 (Pensacola); Jordan & Gilbert, Synopsis Fish. N. Am., 535, 1883 (Pensacola); Jordan, Proc. U. S. Nat. Mus., 39, 1884 (Pensacola); Jordan, Cat. Fish. N. Am., 82, 1885.

Serranus dispilurus Jordan, Proc. U. S. Nat. Mus., 1886, 27 (Beaufort, N. C.).

Serranus brasiliensis Jordan & Eigenmann, Proc. U. S. Nat. Mus., 1887, 269 (Charleston).

Etymology.—*Subligarius*, wearing a truss, in allusion to the white cross-band.

Habitat.—South Atlantic coasts of United States.

Our specimens of this species are from Pensacola, Charleston, and Beaufort, and they correspond to *Centropristis subligarius* Cope. All of them have the dorsal rays X, 13 (in one case XI, 13), and all have the inky spot on the soft dorsal large, and very conspicous. In these the pectoral is finely barred, like the caudal fin.

Günther's *dispilurus*, from Trinidad, is said to have the dorsal X, 12, the dorsal spot small, and the pectorals red; otherwise the description agrees entirely with our specimens. With the account of *dispilurus* the short description given by Cuvier and Valenciennes of *Dules flaviventris* is in perfect agreement.

One of the types of Brisout de Barneville's *Centropristis brasiliensis* is preserved in the museum at Paris, where it has been examined by us. This has the dorsal rays X, 12, the dorsal spot obscure and diffuse, but is otherwise similar to *subligarius*. All have the second anal spine long, the caudal barred, a white bar before anal, the caudal truncate, with other characters, which readily distinguish this species from all others related to it. We feel little doubt, therefore, that *subligarius*, *brasiliensis*, and *dispilurus* are synonyms of *flaviventris*. If two species exist, *subligarius*, the northern form, would be separated from the *flaviventris* by its number of dorsal rays—greater than that of any of the other species in this division of *Serranus*; by having the pectoral fin barred like the caudal, and the black spot on the dorsal very large. It is, however, probable that

brasiliensis represents the adult of the species, *flaviventris* or *dispilurus* younger specimens, and *subligarius* those still younger. In the type of *brasiliensis* the head is considerably less slender than in *subligarius*. This is probably a matter of age. This species reaches but a small size, none of the known specimens being six inches in length.

As all known specimens of *subligarius* have thirteen soft dorsal rays, and all of *flaviventris* examined have twelve, we let them stand for the present as distinct species.

84. SERRANUS FLAVIVENTRIS.

Dules flaviventris, Cuv. & Val., Hist. Nat. Poiss., III, 113, 1829 (Brazil); Günther, I, 267 (copied).
Centropristis brasiliensis Brisout de Barneville, "Revue Zoologique, 1847, 131" (Brazil); Günther, I, 85, 1859 (St. Helena).
Serranus brasiliensis Jordan, Proc. U. S. Nat. Mus., 1886, 533 (from Brisout de Barneville's type).
Centropristis dispilurus Jordan, Proc. U. S. Nat. Mus., 1886, 27 (Beaufort, N. C.).

Habitat.—Brazilian fauna. Trinidad to St. Helena.
Etymology.—*Flavus*, yellow; *venter*, belly.

For a discussion of the relation of this species to the preceding, see our remarks on *S. subligarius*.

The only specimen of this form which we have seen is the type of *C. brasiliensis* in the museum at Paris.

85. SERRANUS ANNULARIS.

Centropristis annularis Günther, Shore Fishes, Challenger, 1880, 6, pl. I, fig. C (Pernambuco).

Habitat.—Coast of Brazil.
Etymology.—*Annularis*, ringed.

This species is known from a short description and a figure of a very young individual about 2 inches long. It is probably a valid species—not the young of *Serranus flaviventris*.

86. SERRANUS ATROBRANCHUS.

Centropristis atrobranchus Cuv. & Val., Hist. Nat. Poiss., III, 45, 1829 (Brazil); Günther, I, 1859, 86 (copied).
Serranus atrobranchus Jordan, Proc. U. S. Nat. Mus., 1886, 532 (examination of original type).

Habitat.—Coast of Brazil.
Etymology.—*Ater*, black; *branchia*, gill (*βράγχια*, gills).

Only the original type of this strongly marked species is yet known. It was collected in Brazil by Delalande, and from it our description was taken.

87. SERRANUS ÆQUIDENS.

Serranus æquidens Gilbert, Proc. U. S. Nat. Mus., 1890 (west coast of Mexico).

Habitat.—Pacific coast of tropical America.
Etymology.—*Æquus*, equal; *dens*, tooth.

This species is known from its type, 7 inches long, dredged by the *Albatross* at Station 2996, off the west coast of Mexico.

88. SERRANUS FUSCULUS.

Centropristes fusculus Poey, Memorias, II, 342. 1860 (Havana).
Haliperca fuscula Poey, Synop. Pisc. Cubens., 281, 1868 (Havana); Poey, Enumeratio, 22, 1875 (Havana).

Habitat.—West Indian fauna. Cuba.
Etymology.—*Fusculus*, somewhat tawny.

This species is known only from the original type, sent by Poey to the museum at Cambridge. From this specimen (10015, M. C. Z., 7 inches in length) our description is taken.

89. SERRANUS PHŒBE.

Serranus phœbe Poey, Memor., Cuba, I, 55, 1851, pl. 2, fig. 3; Jordan, Proc. U. S. Nat. Mus., 35, 1884 (Pensacola); Jordan, Proc. U. S. Nat. Mus., 39, 1884 (Pensacola); Jordan, Cat. Fish. N. Am., 83, 1885; Jordan, Proc. U. S. Nat. Mus., 1886, 39 (Havana).
Centropristis phœbe Günther, Cat. Fish. Brit. Mus., I, 85, 1859 (Cuba).
Haliperca phœbe Poey, Synopsis Pisc. Cubens., 281, 1868 (Havana); Poey, Ann. Lyc. Nat. Hist., 34, 1871 (Cuba); Poey, Enumeratio Pisc. Cubens., 22, 1875 (Havana).

Habitat.—West Indian fauna, north to Pensacola.
Etymology.—*Phœbe*, the moon.

Our specimens of this species are from Havana and Pensacola.

90. SERRANUS PSITTACINUS.

Prionodes fasciatus Jenyns, Voy. Beagle, Fishes, 46, 1840; Günther, Cat. Fish. Brit. Mus., I, 96, 1859, (Chatham Island, Galapagos) (not *Holocentrus fasciatus* Bloch, which is *Serranus scriba*); Jordan, Proc. U. S. Nat. Mus., 1889, 81 (Charles, Hood, and Albemarle Islands, Galapagos).
Serranus psittacinus Valenciennes, Voyage Vénus, Poiss., 290, pl. I, f. 1, 1855 (Galapagos Islands).
Centropristis psittacinus Günther, I, 186 (copied).
Serranus calopteryx Jordan & Gilbert, Proc. U. S. Nat. Mus., 338, 1881 (name only); Jordan & Gilbert, Proc. U. S. Nat. Mus., 350, 1881 (Mazatlan); Jordan & Gilbert, Bull. U. S. Fish Com., 170, 1882 (Mazatlan); Jordan, Cat. Fish. N. Am., 83, 1885; Jordan, Proc. U. S. Nat. Mus., 376, 1885 (Pearl Islands; Galapagos).

Habitat.—Panama fauna. Cape San Lucas to Galapagos Islands.
Etymology.—*Psittacus*, a parrot.

We have examined specimens of this species from Mazatlan, Pearl Islands (Panama), La Paz, and from Charles, Hood, Albemarle, and Indefatigable Islands, of the Galapagos. The specimens from La Paz and Indefatigable are in the museum at Cambridge. Numerous specimens were also taken by Dr. Gilbert at the Revillagigedos.

The earliest specific name of this species, *fasciatus*, can not be used if the species be referred to *Serranus*, as already more than one *Serranus* has been called *fasciatus*. The oldest tenable specific name is therefore *psittacinus*. The genus *Prionodes* was supposed by Jenyns to differ from *Serranus* by the absence of vomerine and palatine teeth. These teeth are, as a matter of fact, well developed in the young, but in some old specimens they are small, partly covered by the skin, and possibly even deciduous.

91. SERRANUS TIGRINUS.

Holocentrus tigrinus Bloch, pl. 237, 1790; Bloch & Schneider, Syst. Ichth., 314, 1801 (East Indies).
Serranus tigrinus Jordan, Proc. U. S. Nat. Mus., 1886, 579.
Serranus præstigiator Poey, Mem. Cuba, I, 58, 1851, tab. 2, fig. 2 (Havana).
Centropristis præstigiator Günther, Cat. Fish. Brit. Mus., I, 85, 1859 (Cuba).
Haliperca præstigiator Poey, Synop. Pisc. Cubens., 282, 1868 (Havana); Poey, Enumeratio, 22, 1875 (Havana).

Habitat.—West Indian fauna.
Etymology.—*Tigrinus*, spotted like a tiger.

Of these exceedingly handsome little fish, we have examined only the original type of *Serranus præstigiator*, sent by Poey to the museum at Cambridge. We see no reason to doubt the identity of *Holocentrus tigrinus* Bloch with this species.

92. SERRANUS TABACARIUS.

(JACOME.)

Centropristes tabacarius Cuv. & Val., Hist. Nat. Poiss., III, 44, 1829 (Martinique); Storer, Synopsis, 287, 1846 (copied); Guichenot, "Ramon de la Sagra, Hist. Cub., Poiss., 28, 1850."
Haliperca tabacaria Poey, Synopsis Pisc. Cub., 282, 1868 (Havana).
Serranus tabacarius Jordan, Proc. U. S. Nat. Mus., 1886, 39 (Havana).
Serranus jacome Poey, Memor. Cuba, I, 57, 1851, tab. 2, fig. 1 (Havana).
Haliperca jacome Poey, Ann. Lyc. Nat. Hist., 34, 1871 (Cuba); Poey, Enumeratio, 22, 1875 (Havana).

Habitat.—West Indian fauna.
Etymology.—*Tabacarius*, pertaining to *tabacum*, tobacco, the fish being called *bout de tabac* (cigar stump) by the negroes at Martinique.

The specimens of this species examined by us are from Havana, where it is rather common.

93. SERRANUS FLAVESCENS.

Serranus flavescens Cuv. & Val., Hist. Nat. Poiss., VI, 506, 1830 (Martinique); Storer, Syn. Fish. N. A., 280, 1846 (copied).

Habitat.—Martinique.
Etymology.—*Flavescens*, yellowish.

Only the type of this species is as yet known. This we have not seen. For a partial description of it we are indebted to M. Alexandre Thominot, of the Muséum d'Histoire Naturelle, at Paris.

94. SERRANUS PERUANUS.

Serranus peruanus Lesson, Voyage de la Coquille, tome II, part 1, p. 234, 1828 (Payta).

Habitat.—Coast of Peru.
Etymology.—*Peruanus*, Peruvian.

We place this species in *Serranus*, solely on account of the number of the dorsal rays (X, 12). The scanty description refers only to the coloration, which resembles that of *Epinephelus analogus* and *Paralabrax maculatofasciatus*, but in both these species the number of dorsal rays is greater.

The following is Lesson's original description:

Serran péruvien.

Serranus peruanus Lesson.

P. 13; d. $\frac{1}{12}$; cat. $\frac{1}{5}$; a. $\frac{3}{8}$; c. 16.

Ce petit serran, non compris dans la révision des espéces par MM. Cuvier et Valenciennes, provient de la baie de Payta, sur la côte du Pérou, où il est commun. Il y est nommé cabrilla. Sa taille est communément de 5 pouces, bien qu'il ait parfois jusqu'à 10 ou 12 pouces. Il est entièrement d'un rouge brunâtre, marqué d'une raie blanche le long de la ligne latérale; puis tout tacheté de rouge brun sur la tête, le corps et les flancs. Le ventre et les côtés sont blanc argenté; mais sept à huit taches larges, arrondies, se dessinent sur ce fond clair et luisant. La tête est ponctuée de rouge. L'œil est cerclé d'orangé; la dorsale est fauve, rubanée de rouge ocreux. La caudale est brunâtre ainsi que les catopes. Les pectorales sont cannelle, et l'anale rouge-brunâtre avec deux taches rouge-brun arrondies.

95. SERRANUS CASTELNAUI nom sp. nov.

Centropristis nebulosus Castelnau, Animaux Nouveaux ou Rares de l'Amérique du Sud, 1855, 5, pl. I, fig. 4 (Rio Janeiro) (not *Serranus nebulosus* Cuv. & Val.).

Habitat.—Coast of Brazil.

Etymology.—*Nebulosus*, clouded.

This species is known from Castelnau's figure only, the description consisting of notes on the coloration. The figure is not very exact, as the number of soft rays in the fins can not be certainly counted. The projection of the lower jaw indicates a species allied to *S. luciopercanus*, but with deeper body and shorter snout.

As the name *nebulosus* is preoccupied in *Serranus*, this species needs a new name if referred to the latter genus.

The following is the whole of Castelnau's description:

Le corps est d'un gris ardoisé; nageoire dorsale avec des taches rouges et d'autres jaunes sur le bord supérieur; tête et nageoires rosées; une tache d'un rouge foncé sur la base de la pectorale; nageoire caudale obscure avec un bord terminal lilas; ventre d'un blanc grisâtre. Rio-de-Janeiro.

To this scanty account the following is added by our friend, M. Alexandre Thominot, who has examined, at our request, the original type in the museum at Paris:

Centropristis nebulosus Castelnau. (Type.) D. IX-I, 12; A. (brisée); P. 18. L. lat. 72 environ; lign. transv. 16-10. Branch. 7.

Longueur totale du seul spécimen qui est une mauvaise peau 0m 308. La tête contenue environ trois fois dans l'étendue du poisson sans tenir compte de la caudale. Mandibule plus longue que la mâchoire supérieure. Dents en carde sur les mâchoires, au vomer et sur les ptérygoïdiens; sur la mâchoire inférieure on aperçoit, sur les côtés, quatre ou cinq petites canines. Œil égal à l'espace interorbitaire, ou de même dimension que le parcours compris entre la deuxième narine et le bout du museau et forme environ le cinquième de la tête. Pectorales de même longueur que l'espace compris entre le bout du nez et le bord de l'interopercule. Ventrales de même dimension que le lobe inférieur de la caudale. Premier rayon épineux dorsal contenu trois fois et demi dans la hauteur du troisième qui est lui-même égal au 4me; le 2me est contenu deux fois et un tiers dans ce même rayon. L'épine operculaire la plus longue est égale au premier rayon dorsal.

Je ne puis rien vous dire de la coloration; je craindrais de faire quelque erreur.

96. SERRANUS STILBOSTIGMA.

Prionodes stilbostigma Jordan & Bollman, Proc. U. S. Nat. Mus., 1889, 158 (sea west of Ecuador).

Habitat.—Pacific coast of equatorial America.

Etymology.—Στιλβός, shining; στίγμη, spot.

This species is known from a single example, dredged in 45 fathoms, at the equator, off the coast of Ecuador.

In form it agrees very closely with *Serranus luciopercanus* of the Atlantic coast, but the coloration is quite different.

97. SERRANUS LUCIOPERCANUS.

Serranus luciopercanus Poey, Memorias, I, 56, 1851, tab. 9, fig. 1 (Havana); Steindachner, "Verh. Zool. Ges. Wien, 1866, 777, tab. 16, f. 1."

Centropristis luciopercanus Günther, Cat. Fish. Brit. Mus., I, 84, 1869 (copied); Vaillant & Bocourt, Miss. Sci. au Mexique, 1874, Pl. V, f. 1.

Mentiperca luciopercana Poey, Synop. Pisc. Cubens., 281, 1868 (Havana); Poey, Enumeratio, 23, 1875 (Havana).

Habitat.—West Indian fauna.

Etymology.—*Luciopercanus*, resembling *Lucioperca*, a synonym of the percoid genus *Stizostedion*.

Of this species we have seen only the original type, a young specimen sent by Poey to the museum at Cambridge. *Serranus luciopercanus* and its near relative, *S. stilbostigma*, differ somewhat in form from the other species of *Prionodes*. The snout is sharper and the lower jaw unusually prominent. But both these characters are subject to intergradations. The snout is very sharp in *S. subligarius*, and the lower jaw in *S. psittacinus* is almost as long as in *S. luciopercanus*. For these reasons we are unable to recognize *Mentiperca* as a distinct genus.

98. SERRANUS SCRIBA.

(THE SEA-PERCH; VAQUETA.)

Perca lineis utrinque septem, etc., Artedi, Genera, 40, 1734.

Perca scriba Linnæus, Syst. Nat., Ed. X, 292, 1758 (no locality; and of the early copyists).

Serranus scriba Cuv. & Val., Hist. Nat. Poiss., I, 214, 1828; Günther, I, 103, 1859 (and of most recent writers).

Perca marina Linnæus, Syst. Nat., Ed. X, 290, in part (based properly on a fish from Norway—*Sebastes marinus*—the *Perca lineis*, etc., of Artedi being included in the synonymy).

Holocentrus fasciatus Bloch, Ichthyol., taf. 240, 1790.

Holocentrus marocannus Bloch & Schneider, Syst. Ichth., 320, 1801 (Morocco).

Lutjanus scriptura Lacépède, Hist. Nat. Poiss., IV, 229, 1803 (Mediterranean).

Holocentrus argus Spinola, Ann. du Mus., X, 372, 1807.

Serranus papilionaceus Cuv. & Val., VIII, 471, 1831 (Gorea; Canary Islands); Günther, I, 114 (copied).

Habitat.—Mediterranean Sea and neighboring waters, including the Azores and Canary Islands.

Etymology.—*Scriba*, a writer, from the script-like markings.

Our specimens of this common species are from Palermo and Venice.

99. SERRANUS ATRICAUDA.

Serranus atricauda Günther, Ann. Nat. Hist., XIII, 1874, 230 (Mogador, Morocco; Azores; Madeira; Teneriffe); Hilgendorf, Die Fische der Azoren, 1889, 206 (Azores).

Habitat.—Ocean northwest of Africa.

Etymology.—*Ater*, black; *cauda*, tail.

We know this species from descriptions only.

100. SERRANUS CABRILLA.

(SERRAN; SERRANO; CABRILLA.)

Perca cabrilla Linnæus, Syst. Nat., I, Ed. X, 294, 1758 (no locality, and of most early authors and copyists).
Serranus cabrilla Cuv. & Val., II, 1828, 223, Pl. XXIX; Günther, I, 106, and of authors generally.
Pseudoserranus cabrilla Klunzinger, Fische des Rothen Meeres, 1884, 7.
? *Labrus chanus* Forskål Descr. Anim., 1775, 36 (Constantinople).
? *Labrus hiatula* Bonnaterre, Encycl., Méthod., 1788, 116 (after Willoughby).
Holocentrus argentinus Bloch, Ichthyol., IV, 473, Taf. 235, f. 2, 1790 (according to Peters).
Lutjanus serranus Lacépède, Hist. Nat. Poiss., IV, 205, 1803.
Holocentrus flavus Risso, Ichth., Nice, 293, 1810.
Holocentrus serran Risso, *l. c.*, 294.
Perca channus Couch, "Lond. Mag. Nat. Hist., V. 19, f. 6, 1832" (Cornwall).
Serranus novemcinctus Kner, Novara, Fische, 17, f. 1 ("Capstadt" and St. Paul's Island); Sauvage, Archiv. Zool. Expér., VIII, 1880, 7.
Pseudoserranus bicolor "Kossman & Räub, Ergebn. Reise Rothen Meere, 7, t. 1, f. 1" (Red Sea).

Habitat.—Mediterranean Sea, Azores Islands, coasts of southern Europe and northern Africa.

Etymology.—*Cabrilla*, Spanish diminutive of *cabra* (Latin *caper*, goat).

This well known species is represented in our collection by specimens from Palermo, Italy. Its synonymy offers no special difficulty.

It seems to us evident that the generic name *Serranus* must always remain with this species. *Serranus* is a latinization of the French name "Serran," and this species is mentioned as the "Serran properly so called" by Cuvier, the author of the genus *Serranus*.

Genus XXIII.—PRONOTOGRAMMUS.

Pronotogrammus Gill, Proc. Ac. Nat. Sci. Phila., 1863, 81 (*multifasciatus*).
Hemianthias Steindachner, Ichth. Beiträge, I, 4, 1874 (*peruanus*).

TYPE.—*Pronotogrammus multifasciatus* Gill.

Etymology.—*Πρό*, before; *νῶτος*, back; *γραμμή*, line, in allusion to the upward curve of the lateral line.

This genus, as understood by us, contains four American species, relatives of the type of *Anthias*, but differing in the naked top of head, crown, and maxillary. The comparative study of a large number of species will be necessary before these genera of *Anthiinæ* can be put on a firm foundation. The species treated in the present paper form but a small part of the whole group, and the foreign species we have had no opportunity to study.

Hemianthias, distinguished by the smaller scales and by the smaller canines, seems to us a section of *Pronotogrammus* rather than a distinct genus.

ANALYSIS OF SPECIES OF PRONOTOGRAMMUS.

a. Scales rather small, about 56 in the lateral line; canines small; head and body moderately compressed (*Hemianthias* Steindachner).

b. Pectoral fin short, 1⅔ in head; middle rays of caudal as long as head; body compressed, rather deep, deepest behind the head; head compressed, almost as deep as long; anterior profile nearly straight, moderately steep; mouth moderate, very oblique, the lower jaw projecting, its tip entering the profile; preorbital narrow, as broad as pupil, its edge roughened with mucous tubes; maxillary 2 in head; eye very large, 4¼ in adult; maxillary naked, very

broad at tip, its width three-quarters eye; snout 4¼ in head; snout and forehead and top of head naked; teeth very small, in very narrow bands; two canines each directed outward, in front of lower jaw, a smaller one turned backward before middle of side of jaw; upper jaw with a single short canine directed forward on each side in front; interorbital region flattish, with two bony ridges and a median depression; smooth area of frontal region of skull short and small, broader than long; occipital crest high and long; preopercle sharply serrate, its angle a right angle; gill-rakers very long, slender, and close set, x + 23, the longest three-fifths eye; branchiostegals 7 (8 according to Steindachner); dorsal spines rather low, slender, only the third produced in a long, stiffish filament, which reaches the third soft ray; soft dorsal naked, the last rays very high, 1⅞ in head; caudal very long, with a narrow fork, the middle rays as long as head and 1⅞ in the longest; anal high, its spines moderate, graduated; ventrals elongate, the third ray longer than head; pectorals shortish, pointed, 1⅞ in head; scales moderate; lateral line complete, running abruptly upward and backward to below sixth dorsal spine, then gradually curving downward; color rose red, with small diffuse golden-brown spots on body and on soft dorsal, caudal, and anal. Head, 3⅛ in length; depth, 3. D. X, 14; A. III, 8. Scales, 5–56–20 ..... PERUANUS, 101.

aa. Scales large, 30 to 50 in the lateral line; canine teeth rather strong, conspicuous; body lanceolate, compressed (*Pronotogrammus*).

c. Scales not large, about 50 in the lateral line; second anal spine a little shorter than third; ventrals longer than pectorals; profile convex to the occiput, straight anteriorly; mouth very oblique, the maxillary extending to below pupil, 2⅛ in head; lower jaw with a canine in front on each side directed forward and outward; a canine hooked backward in front of middle of side of jaw; upper jaw with a canine directed forward on each side in front; eye longer than snout, 3 in head; vertical margin of preopercle serrate, the serræ larger below; a short, strong, flat spine at the angle; lower limb entire or serrate; top of head naked from the occiput forward; five series of scales on cheek; dorsal spines rapidly graduated to the fourth, which is nearly half head; several of the spines ending in long, fragile dermal filaments; the filament of the fourth spine longest, sometimes reaching caudal; caudal very deeply forked, some of the outer rays produced, sometimes half length of body; anal spines graduated, the second 3⅛ in head; pectorals short, 1¼ in head; ventrals produced, extending beyond origin of anal; lateral line on third row of scales; gill-rakers very numerous, long and slender; color carmine, deepest on the back, becoming a clear violet on sides; back and sides everywhere freckled with golden olive, this on the sides becoming reticulations around the violet; a bright golden stripe from eye to base of pectoral above; another from tip of snout along lower border of eye to middle of pectoral; dorsal carmine, the rays tinged with golden; caudal similar; anal golden; pectoral carmine; ventrals red and yellow. Head, 3½ in length; depth, 3½. D. X, 14 or 15; A. III, 7 or 8. Scales, 3–48–16 ..... VIVANUS, 102.

cc. Scales medium, about 38 in the lateral line; body elongate, the head thick, the lower outline nearly straight; mouth oblique; tip of lower jaw fitting into a notch of upper, not entering profile; maxillary broad, reaching middle of pupil, 2⅛ to 2½ in head; teeth in a narrow band above, in one series below; one or two canines directed forward and outward in front of each jaw; a pair on sides of jaw turned backward and inward; no teeth on tongue; interorbital space somewhat concave, the supraocular ridges being elevated; preorbital narrow, about one-third pupil; eye very large, 3 in head; angle of preopercle slightly projecting, its serræ coarser; gill-rakers long, slender, x + 30, the longest half orbit; dorsal emarginate, the spines slender and pungent, the sixth longest, 3⅛ in head, 1⅓ times tenth; each spine with a short filament near its tip, as usual in this genus; soft dorsal high; anal similar, its second spine shorter than third, which is 3⅞ in head. Caudal forked, the middle rays two-thirds the outer, which are not produced; pectorals short, reaching a little beyond front of anal; scales large, ctenoid, extending forward from occiput on top of head to middle of orbit; snout and maxillary naked; scales on cheek in six rows; dorsal and anal naked; lateral line very high on the third row of scales. Rose-red, silvery below, the fins light yellow; a dark spot above the middle of each eye and two V-shaped olive marks behind head, the apex of the one at the nape, the other at front of dorsal; lining of gill cavity and peritoneum silvery. Head, 2⅓ to 2⅜ in length; depth, 2⅔ to 3. D. X, 15; A. III, 8. Scales, 2½–38–X ..... EOS, 103.

ccc. Scales very large, 31 in the lateral line; second anal spine longer than third; ventrals rather shorter than pectorals (in the young); depth about 4 (to end of middle caudal rays); head 3 in same distance; eye 3 in head; snout less than half eye; four upper front canines; two lower front and two lateral canines; dorsal spines rapidly increasing to the fourth, which is about 7 in length of body, thence decreasing to the last, which is 11 in length; longest soft ray about equal to longest spine; median caudal rays 6⅔ in length, longest greater than depth of body; color reddish, the young with numerous dark rufous bands, descending nearly to the middle. D. X, 15; A. III, 7. Scales 2-31-12.....MULTIFASCIATUS, 104.

101. PRONOTOGRAMMUS PERUANUS.

Anthias (Hemianthias) peruanus Steindachner, Ichth. Beiträge, I, 1874, 4 (Payta; Trujillo).

Habitat.—Coast of Peru and Chili.

Etymology.—*Peruanus*, Peruvian.

Of this species we have examined two of Dr. Steindachner's original types (10232, M. C. Z.), from Payta, Peru. The largest of these is 15 inches in length and is now in poor condition. A specimen which we suppose to belong to the same species is also in the U. S. National Museum from Chili. This species reaches a larger size than the others of our *Anthiinæ*. It must be a very handsome fish in life.

102. PRONOTOGRAMMUS VIVANUS.

Anthias vivanus Jordan & Swain, Proc. U. S. Nat. Mus., 544, 1884 (Pensacola); Jordan, Cat. Fish. N. Am., 83, 1885.

Habitat.—West Indian fauna, north to Pensacola.

Etymology.—From the Red Snapper or *Vivanet*, from the stomach of which this species was first taken.

All the known specimens of this brilliantly colored species have been taken off the Snapper Banks between Pensacola and Tampa. Nearly all of them have come from the spewings of the speckled "Hind," *Epinephelus drummond-hayi*.

103. PRONOTOGRAMMUS EOS.

Anthias eos Gilbert, Proc. U. S. Nat. Mus., 1890 (Station 2996).

Habitat.—Pacific coast of tropical America.

Etymology.—*Ἠως*, sunrise.

This species is known from several examples dredged by the *Albatross* at Station 2996, off the west coast of Mexico.

104. PRONOTOGRAMMUS MULTIFASCIATUS.

Pronotogrammus multifasciatus Gill, Proc. Ac. Nat. Sci. Phil., 81, 1863 (Cape San Lucas).

Anthias multifasciatus Jordan & Gilbert, Proc. U. S. Nat. Mus., 360, 1882 (Cape San Lucas); Jordan, Cat. Fish. N. Am., 83, 1885; Jordan, Proc. U. S. Nat. Mus., 377, 1885 (Cape San Lucas).

Habitat.—Pacific coast of Mexico.

Etymology.—*Multus*, many; *fasciatus*, banded.

This species is known only from the original type, a very young example taken at Cape San Lucas by Mr. John Xantus.

Genus XXIV.—ANTHIAS.

Anthias Bloch, Ichthyologia, 1792 (*sacer* = *anthias*).

Aylopon Rafinesque, Caratteri di alcuni Nuovi Generi, etc., Sicilia, 52, 1810 (*anthias*) (substitute for *Anthias*, said to be preoccupied).

TYPE.—*Anthias sacer* Bloch; *Labrus anthias* (Linnæus).

Etymology.—*Ἀνθίας*, ancient name of some large fish, perhaps the Albicore; probably from *ἄνθος*, a flower.

We retain the generic name of *Anthias* for *Anthias anthias* and its immediate relatives, letting *Pronotogrammus*, *Odontanthias*, and other closely related groups stand for the present as distinct genera. None of the species of *Anthias* are American, and *Anthias anthias* is the only one of them which we have been able to examine.

We find no warrant for Rafinesque's statement that the name *Anthias* is preoccupied. We find the name *Anthia* among the insects, bearing date of 1801.

ANALYSIS OF EUROPEAN SPECIES OF ANTHIAS.

a. Maxillary with about five series of large scales; ventral fins very much produced, the second ray reaching entirely beyond base of anal fin; third dorsal spine elevated, twice as high as any of the others, about as long as head; body oblong ovate, strongly compressed; head compressed; profile convex, slightly depressed between the eyes; eyes large, 3¼ in head; mouth large, oblique; maxillary very broad posteriorly, its greatest width nearly three times the width of the narrow preorbital; teeth in both jaws uniserial laterally, in bands in front; one or two strong recurved canines on each side of lower jaw; a straight antrorse canine on each side in front; canines of upper jaw short, turned forward; no teeth on tongue; posterior edge of preopercle finely serrate, with larger spines at the angle; preorbital and lower jaw naked, rest of head scaly; scales on top of head very small, extending beyond nostrils. Dorsal spines long and slender, the third much elevated; soft dorsal with some elongate rays; caudal very deeply forked, the lobes produced; second and third anal spines subequal; third soft ray longer than longest soft dorsal rays; pectorals short, not reaching beyond front of anal; color red; head with three yellow bands radiating from eye; body freckled with greenish or yellowish spots; two bands on side of occiput, and a series of spots along base of dorsal; fins brownish green. Head, 3⅓ in length; depth, 2⅔. D. X, 15; A. III, 7. Scales, 5–38–16.....ANTHIAS, 105.

105. ANTHIAS ANTHIAS.

(BARBIER; IMPERADOR.)

Labrus totus rubescens cauda bifurca Artedi, Synonomia, 54, 1737 (Mediterranean).

Labrus anthias Linnæus, Syst. Nat., Ed. X, 282, 1758 (after Artedi) (and of copyists).

Perca pennanti Bloch, "Schrift. naturforschender Freunde, X, pl. 9, f. 1, 1782."

Anthias sacer Bloch, Ichthyologia, Taf. 375, 1792; Cuv. & Val., II, 250; Günther, I, 88, and of nearly all recent writers.

Aylopon ivicæ Guichenot, Index Generum ac Specierum Anthiadidorum, 2, 1868 (Ivica; Malta).

Aylopon hispanus Guichenot, *l. c.*, 2 (Spain).

Aylopon rissoi Guichenot, *l. c.*, 3 (Nice).

Aylopon nicæensis Guichenot, *l. c.*, 4 (Nice).

Aylopon canariensis Guichenot, *l. c.*, 5 (Canaries; Madeiras).

Aylopon algeriensis Guichenot, *l. c.*, 5 (Algiers).

Habitat.—Coasts of southern Europe and northern Africa.

Etymology.—*Ἀνθίας*, ancient name of some large fish.

This handsome fish is rather common in waters of moderate depth in southern Europe. The specimens before us were collected by Professor Doderlein at Palermo, in Sicily.

The nominal species of Guichenot are based on slightly differing proportions of parts of the head and body, characters too trivial to merit notice from naturalists.

Genus XXV.—ODONTANTHIAS.

Odontanthias Bleeker, Sur les Espèces Indo-Archip. d'Odontanthias, etc., 1872, 1,* (*borbonius*).

TYPE.—*Anthias borbonius* Günther.

Etymology.—ὀδούς, tooth; *Anthias*, a related genus.

This genus contains three East Indian species and the following from America. As compared with *Anthias*, it seems to differ in no important respect, except in the presence of a band of small teeth on the tongue.

Allied to *Odontanthias* is the genus *Holanthias* Günther (*H. fronticinctus* Gthr., from St. Helena). In this genus the caudal fin is rounded, and none of the fin-rays are produced.

ANALYSIS OF AMERICAN SPECIES OF ODONTANTHIAS.

a. Dorsal rays X, 15.

b. Third dorsal spine higher than any succeeding ones; ventral fins scarcely elongate, shorter than head; body oblong; head obtuse; profile almost straight, somewhat depressed in front of the eye; eyes large, scarcely equal to the interorbital area, 3 in head; maxillary broad, with five or six rows of large scales, its length 2½ in head; mouth very oblique, the lower jaw projecting; snout 5 in head; preopercle finely serrate, with coarser teeth at the angle, which is salient; four canines in upper jaw, the outer turned forwards, the inner recurved; six other canines in the lower jaw, the middle two extending forward and outward; those on the sides recurved; no lateral canines; an oval patch of minute teeth on the tongue; third dorsal spine one-third longer than the fourth; ventrals shorter than pectorals, 1⅔ in head; pectorals equal to length of head; caudal lunate, the lobes equal, scarcely exceeding the height of the head; head above and both jaws closely scaled; five or six rows of large scales on cheeks; color "golden red, little paler below, many lustrous green spots on the back; fins all unspotted and more or less yellow; upper part of head red." Head, 3⅓ in length; depth, 3. D. X, 15; A. III, 7. Scales 4–35–14.....MARTINICENSIS, 106.

bb. [Third dorsal spine not longer than those following it, the spines being graduated; ventrals extremely elongate, their filiform tips reaching nearly to base of the caudal fin; body rather elevated and compressed; the depth 2½ in length; head 3; head short, very obtuse; eye large, longer than snout, about 3 in head; head everywhere scaly; mouth very oblique, the maxillary suddenly widening behind; preorbital narrow, half as broad as the maxillary; crown of head convex; preopercle finely serrate, with coarser teeth at the angle; tongue with an oval patch of teeth; jaws with anterior canines, and a lateral canine on the mandible; scales large; lateral line strongly arched; caudal deeply forked, the lobes half length of body; dorsal spines all graduated, the last more than twice diameter of eye; soft dorsal and anal elevated, but without exserted ray; pectoral long, reaching soft portion of anal; color red, with parallel oblique and longitudinal golden streaks; head with two oblique bands. D. X, 15; A. III, 7. Scales, 4–37–17.] (*Günther.*).....ASPERILINGUIS, 107.

aa. [Dorsal rays X, 12 (teeth on tongue unknown), closely allied to *Anthias anthias*, but with rather stronger teeth on the preopercle, and the ventral fins longer. D. X, 12; A. III, 6.] (*Cuv. & Val.*).....TONSOR, 108.

* "Les espèces d' *Anthias* à dents linguales, et à caudale fourchue pourraient donc être réunies comme appartenant à un type distinct sous le nom d' *Odontanthias*. L' *Anthias borbonius* Günther est de ce type et les *rhodopeplus* et *chrysostictus* y appartiennent aussi." (Bleeker.)

106. ODONTANTHIAS MARTINICENSIS.

Aylopon martinicensis Guichenot, Anthiani, Ann. Linn. Soc., vol. X, 1868 (Martinique).

Habitat.—West Indian fauna.

Etymology.—*Martinicensis*, living in Martinique.

This species is known to us only from the original type, examined by Dr. Jordan in the museum at Paris.

107. ODONTANTHIAS ASPERILINGUIS.

Anthias asperilinguis Günther, Cat. Fish. Brit. Mus., I, 89, 1859 (South America).

Habitat.—"South America."

Etymology.—*Asper*, rough; *lingua*, tongue.

We know this species from the original description only. In the form of its dorsal it appears to differ widely from *Odontanthias martinicensis*, but its dentition is that of an *Odontanthias*. In the type of *Odontanthias* the third dorsal spine is produced.

108. ODONTANTHIAS (?) TONSOR.

Serranus tonsor Cuv. & Val., Hist. Nat. Poiss., II, 262, 1828 (Brazil).
Anthias tonsor Günther, I, 91, (copied).

Habitat.—Coast of Brazil.

Etymology.—*Tonsor*, a barber; from *barbier*, the French name for *Anthias*.

The scanty description of this species gives no hint as to whether it belongs to *Odontanthias* or to *Anthias*. For the present we refer it, with the other American species, to the former. If it be an *Anthias*, it should be distinguished from *A. anthias* by the fewer fin-rays, D. X, 12.

The type of this species seems to have been lost. Mr. Alexandre Thominot, assistant in the museum at Paris, has searched in vain for it, and it is not mentioned in Guichenot's paper on the species of *Anthias* in the museum.

Genus XXVI.—BATHYANTHIAS.

Bathyanthias Günther, Shore-fishes Challenger Exp., 1880, 6 (*roseus*).

TYPE.—*Bathyanthias roseus* Günther.

Etymology.—*Βᾶθυς*, deep (water); *Anthias*, an allied genus.

This genus is based on a single specimen, a small fish allied to *Pronotogrammus*, but with none of its fin-rays produced. The operculum is said to be without spine, a character rarely found among the Serranidæ.

ANALYSIS OF SPECIES OF BATHYANTHIAS.

a. [Body oblong, moderately compressed, the snout less obtuse than usual in *Anthias*; eye as long as snout, 3½ in head; interorbital area flat, narrow; maxillary scaleless, reaching middle of eye; preopercle evenly rounded, very finely serrated; no spine on opercle; anal scaly; soft dorsal naked; lateral line running very high; dorsal spine feeble, not filamentous, the third slightly longer than the rest, 3 in head, caudal subtruncate; pectorals falciform, not quite as long as head, reaching anal; ventrals half as long as pectorals. Color uniform rose-red, with two paler longitudinal streaks. Head, 3; depth, 3. D. IX, 14; A. III, 8. Scales, 2-58-18.] (*Günther.*) ..... ROSEUS, 109.

109. BATHYANTHIAS ROSEUS.

Bathyanthias roseus Günther, Shore-fishes of the Challenger Exped., 1880, 6, pl. 1, f. B (off Pernambuco, "30 or 350 fathoms").

Habitat.—Coast of Brazil.

Etymology.—*Roseus*, rosy.

This species is known from a single specimen, 4½ inches long.

Genus XXVII.—CALLANTHIAS.

Callanthias Lowe, "Supplementary Synopsis Madeira Fishes, 76, 1839," and Fishes of Madeira, 13, fig. 3 (*paradisæus* = *peloritanus*).

TYPE.—*Callanthias paradisæus* Lowe = *Bodianus peloritanus* Cocco.

Etymology.—*Κάλλος*, beautiful; *Anthias*, an allied genus.

This genus differs from *Anthias* in the absence of armature on the preopercle and in the direction of the lateral line. The lateral line, especially elevated in all the members of this group, reaches the extreme in this genus, running along the highest series of fully developed scales and disappearing under the last dorsal ray.

But two species of this interesting genus are as yet known: *Callanthias peloritanus* and *Callanthias allporti* Günther, from Australia.

ANALYSIS OF EUROPEAN SPECIES OF CALLANTHIAS.

a. Body rather elongate, compressed, the outlines of the back and belly nearly parallel; anterior profile blunt; interorbital space broad and flat; supraoccipital crest high; eye large, 2¾ in head; maxillary narrow, scaly, 2¼ in head; mouth oblique, the lower jaw included; snout very short, half length of eye; teeth as in *Anthias anthias*; preorbital very narrow; preopercle entire; gill-rakers long, slender, close-set, X + 20; scales large; head everywhere scaly except on front of preorbital; lateral line ascending abruptly in front, running very close to the edge of the back, on the first row of scales; lateral line ceasing under last rays of soft dorsal, covering about 23 scales; dorsals subequal, the first two or three shorter; about the fifth soft ray of dorsal elongate, often reaching caudal; anal spines slender, graduated, the soft rays subequal; caudal deeply forked, the lobes attenuate, the upper the longer; pectorals short, 1⅓ in head; ventrals moderate, reaching anal. Color rose-red, paler below; throat pearly white; opercles and spot before pectoral pearly; dorsal and anal yellow, tinged with rose at base and tips; caudal scarlet, the borders and tips yellow; other fins reddish. Depth, about 3 in length; head, 3⅓. D. X (or XI), 9; A. III, 9 or 10. Scales, 38..... PELORITANUS, 110.

110. CALLANTHIAS PELORITANUS.

(*Bird-of-Paradise-fish; Imperador do Alto.*)

Bodianus peloritanus Cocco, "Giornale Sci. Sicilia, Palermo, 1829, 138" (Madeira).
Callanthias peloritanus Günther, I, 87 (Madeira).
Anthias buphthalmos Bonaparte, Faun. Ital., Pesci, about 1839.
Callanthias paradisæus Lowe, "Suppl. Syn. Mad. Fishes, 76, 1839" (Madeira); Lowe, Fishes Madeira, 13 (Madeira).

Habitat.—Mediterranean; coasts of Spain; Madeira.

Etymology.—*Peloritanus*, perhaps from *Peloris*, a genus of mollusks.

This species is known to us through the plate and very full description of Lowe, and also from a specimen (24601, M. C. Z) from Messina in the museum at Cambridge.

Note on **Liopropoma** and **Chorististium**.

Two singular genera. *Liopropoma* (*aberrans*) and *Chorististium* (*rubrum*) have been made known by Poey from single specimens of small size, taken in deep water. We have examined the type of *Chorististium rubrum*. It seems to us more nearly related to *Cheilodipterus* and other *Apogonidæ* than to any of the *Serranidæ*. We therefore omit these two genera from our account of this family. A third peculiar genus, *Gramma* Poey—also known from a single young specimen—has been referred by Bleeker and Gill to the *Pseudochromididæ*, where it may belong, although it bears some slight resemblance to the *Anthiinæ*.

Genus XXVIII.—LATES.

Lates Cuvier & Valenciennes, Hist. Nat. Poss., II, 89, 1828 (*nilotious*).
Plectropoma Bleeker (*calcarifer*, this being the first species of "*Plectropome*" originally mentioned by Cuvier; not *Plectropoma* as restricted by later writers).

TYPE.—*Perca nilotica* Gmelin.

Etymology.—*Lates* or *Latos* (λάτος), the name of the typical species with both the ancient and modern Egyptians.

This genus includes two or three species, fishes of very large size, found in the mouths of the Nile, Ganges, and other rivers of the Old World. We have not studied any of the species of *Lates*, and it is possible that they have no real affinity with *Morone*.

ANALYSIS OF SPECIES OF LATES.

a. [Body robust, the back somewhat elevated, the anterior profile steep an.. nearly straight, the snout sharp, the lower jaw much projecting; maxillary broad, reaching posterior edge of pupil; serræ on preorbital retrorse; second dorsal spine short, the third longest, 1½ in head; anal spines short, the second longest, 4½ in head; pectorals and ventrals short; soft parts of vertical fins somewhat scaly. Color silver-gray, much marbled with darker in life, the markings disappearing after death. Head 3, depth, 3. D. VII–I, 12; A. III, 8. Scales 10–66–19.] (*Steindachner.*).....NILOTICUS, 111.

111. LATES NILOTICUS.

Perca nilotica Gmelin, Syst. Nat., 1788, 1312, and of the copyists.
Lates niloticus Cuv. & Val., II, 89; Günther, I, 67; Steindachner, Fische des Senegals, 1869, 4.

Habitat.—Basins of the Nile and Senegal; a fresh-water species, entering the sea.

Etymology.—*Niloticus*, pertaining to the Nile.

We have not seen this species; our knowledge of it is chiefly drawn from the description and excellent figure of Steindachner.

Genus XXIX.—KUHLIA.

Kuhlia Gill, Proc, Ac. Nat. Sci. Phila., 1861, 48 (*ciliatus*).
Moronopsis Gill, Proc. Ac. Nat. Sci. Phila., 1863, 82 (*marginatus*).
Paradules Bleeker, Nederl. Tijdschr. v. Dierkunde, I, 257 (*marginatus* = *ciliatus*).

TYPE.—*Perca ciliata* Kuhl & van Hasselt.

Etymology.—Named for the discoverer of the typical species, which was found in the streams of Java.

This peculiar and interesting genus is represented by three East Indian species, well described by Bleeker in his paper "Sur le genre *Moronopsis*," besides the two following.

The relations of the genus have been much in doubt. From the resemblance of the species to those of *Xenichthys* and *Xenistius*, Dr. Gill has concluded that it has sparoid affinities, and has placed it near the *Xenichthyinæ*.

But *Kuhlia* has a very narrow and serrated preorbital not at all sheathing the maxillary, its ventrals are destitute of the axillary scale, and the opercle has two strong spines. All these are characters of the *Serranidæ* and not found in the *Sparidæ*. We therefore place *Kuhlia* in the former family. Among the genera of *Serranidæ* it seems to be nearest *Morone*, as the synonym *Moronopsis* would also indicate. In technical characters it agrees with the group we have called *Latinæ*; but, as we have already stated, we are not sure that *Lates* and *Morone* are not representatives each of a different subfamily. In this case *Kuhlia* would represent still another.

ANALYSIS OF AMERICAN SPECIES OF KUHLIA.

a. Eye rather small, 3⅔ in head; body rather deep and compressed, the anterior profile straight or slightly concave; depth 2⅔ in length; head 3⅓, maxillary 2⅔ in head, reaching front of pupil; gill-rakers slender, X + 21; pectorals 1⅔ in head; ventrals 1⅔; fifth (longest) dorsal spine 1⅓. D. IX, I, 11, A, III, 11. Scales, 7–51–12. L. 6 inches. Bluish above; sides bright silvery; caudal fin cream-colored with two oblique black bars on each lobe, these convergent backwards; an oblique black bar upward and backward across soft dorsal; fins otherwise pale ..... ARGE, 112.

aa. Eye very large, 2⅔ in head; body deep, compressed; depth 2⅔ in length; head 3¼; maxillary barely reaching front of pupil; gill-rakers long and slender, 9 + 24; pectorals 2¼ in head; ventrals scarcely reaching vent; longest dorsal spine 1½ in head. D. IX, I, 11; A. III, 11. Scales, 51. Color olivaceous above, silvery below; caudal fin plain ..... XENURA, 113.

112. KUHLIA ARGE.

Kuhlia arge Jordan & Bollman, Proc. U. S. Nat. Mus., 1889 (Chatham Island, Galapagos Archipelago).

Habitat.—Galapagos Islands; Revillagigedos.

Etymology.—ἄργυρος, silver.

This species was first known from several specimens taken by the *Albatross* at Chatham Island. It has since been taken in great abundance by Dr. Gilbert about Clarion Island. It is very close to *K. tæniura*, of the waters of Java, Sumatra, and Buro, but the latter species has the eye larger, 2⅔ to 3 in head. Comparing our specimens with the full description of the latter species given by Dr. Bleeker, we are able to detect no other difference, and it is very likely that our species will prove to be a variety of *K. tæniura*.

113. KUHLIA XENURA.

Xenichthys xenurus Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 454 (supposed to come from San Salvador).

Kuhlia xenura Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 376 (locality questioned).

Habitat.—Probably San Salvador; possibly China.

Etymology.—Ξένος, strange; οὐρά, tail, the tail being more deeply forked than in *Xenichthys*.

Of this species two specimens are in the U. S. National Museum, bearing the label "San Salvador. J. M. Dow." But for certain reasons it is uncertain whether they belonged to Dow's collection, and they may have been brought by Dr. Stimpson from

China. Until the species is again found—either in China or in Central America—its habitat must remain uncertain. The discovery of a species of *Kuhlia* on the west coast of tropical America renders it more likely that *K. xenura* is an American fish.

Genus XXX.—MORONE.

Morone Mitchill, Fishes of New York, 18, 1814 (*rufa=americana*).
Morone Gill, Proc. Ac. Nat. Sci. Phila., 1860, 111 (*americana*).

TYPE.—*Morone rufa* Mitchill=*Perça americana* Gmelin.

Etymology.—Unexplained.

This genus or subgenus contains two known species, both American.

ANALYSIS OF SPECIES OF MORONE.

COMMON CHARACTERS: Lower margin of preopercle simply serrate or entire, the serræ not greatly increasing in size toward the angle, and none of them developed as antrorse hooks. Base of tongue without teeth; edge of tongue with linear patches of teeth; dorsal fins more or less connected by membrane; second anal spine much enlarged, not shorter than third; anal rays III, 8 or 9; lower margin of preopercle finely serrate; lower jaw slightly projecting; body not elongate; vertebræ 11 + 14 = 25 (*americana*).

a. Color in life brassy yellow, with about seven very distinct longitudinal black lines, those below the lateral line interrupted posteriorly, the posterior part alternating with the anterior; body oblong-ovate, the back much arched; head depressed, the snout somewhat pointed, the anterior profile concave; eye large, as long as snout, 4⅓ in head; preorbital finely serrate; suprascapula serrate; mouth small, somewhat oblique, the maxillary nearly reaching middle of orbit, about 3 in head; maxillary somewhat scaly; gill-rakers moderate, x + 13; dorsal and anal spines very robust, the longest dorsal spine 1⅔ in head, the longest anal spine 2½; dorsal fins slightly connected. Head, 3 in length; depth, 2⅔. D. IX, I, 12; A. III, 9. scales, 50 ..... INTERRUPTA, 114.

aa. Color olivaceous, varying to dark green; sides silvery or olivaceous, with faint, paler streaks; body oblong-ovate, the back elevated, but less so than in the preceding; head depressed above eyes; the snout rather pointed; mouth small, the maxillary not reaching middle of orbit, 2⅔ in head; preorbital entire; eye moderate, scarcely as long as snout, 4 in head; gill-rakers 4 + 14, rather long; dorsal and anal spines moderate, the longest dorsal spine 2 in head; the second anal spine 2½; dorsal fins considerably connected. Head, 3 in length; depth, 3. D. IX, I, 12; A. III, 8 or III, 9. Scales, 8–50–9 ..... AMERICANA, 115.

114. MORONE INTERRUPTA.

(THE YELLOW BASS.)

Labrax chrysops Girard, Pacific Railroad Expl., 29, pl. XI, figs. 1–4, 1859 (St. Louis; New Orleans) (not of Rafinesque).

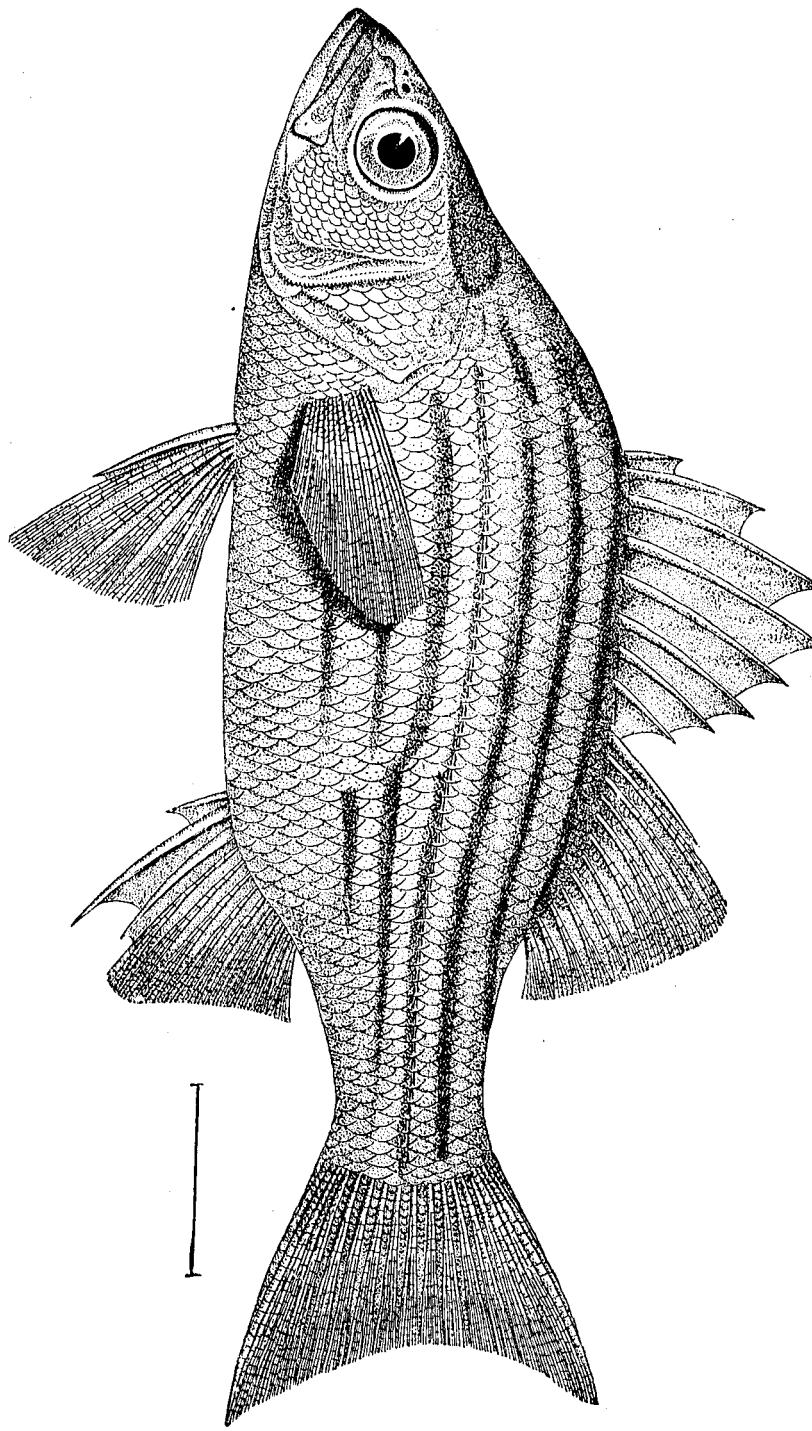
Morone interrupta Gill, Proc. Acad. Nat. Sci. Phila., 1860, 118 (St. Louis; New Orleans); Jordan, Annals N. Y. Ac. Sci., IV, No. 4, 97, 1876 (Miss. R.); Gill, Ichth. Rep. Capt. Simpson's Sur. Great Basin Utah, 398, 1876; Jordan & Brayton, Bull. U. S. Nat. Mus., 1878, 83 (Ohio and Illinois Rs.); Jordan & Gilbert, Syn. Fishes N. A., 530, 1883; Nelson, Bull. Ills. Mus. Nat. Hist., 1876, 36; Jordan, Fishes Ills., 1877, 44 (Illinois R.; Mackinaw Creek; Cairo, Ills.); Jordan, Man. Vert. E. U. S., 137, 1888.

Roccus interruptus Jordan, Geol. Sur. Ohio, 956, 1882; Jordan, Nat. Hist. Aquat. Ans., 431, 1884 (not *Perca mitchilli interrupta* Mitchill = *Roccus lineatus*).

Morone mississippiensis Jordan & Eigenmann, Proc. Ac. Nat. Sci. Phila., 1887 (substitute name for *interrupta*, regarded as preoccupied).

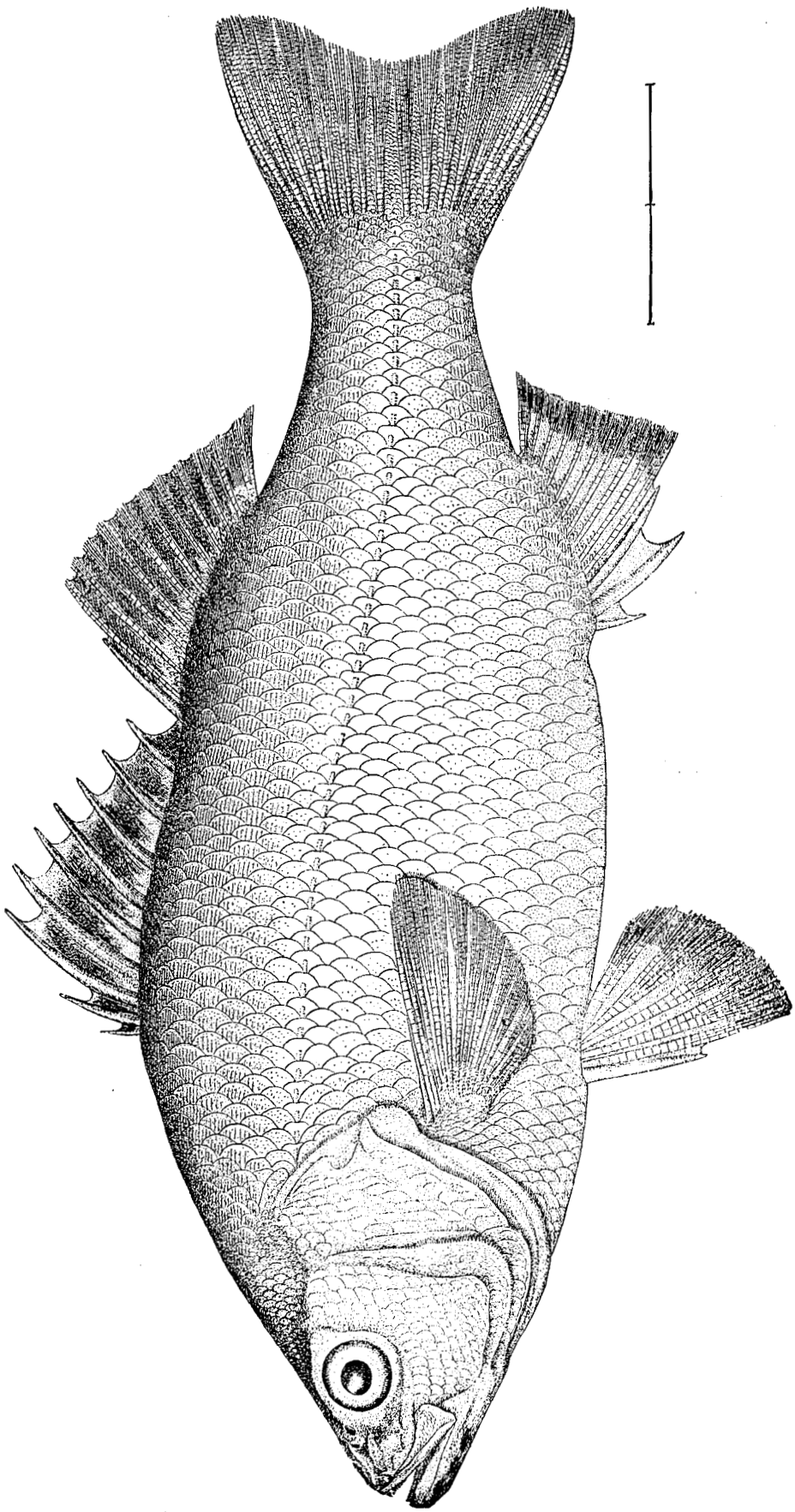
Habitat.—Lower Mississippi Valley, north to Cincinnati and St. Louis, chiefly in the channels of the larger streams.

Etymology.—*Mississippiensis*, pertaining to the Mississippi.



MORONE INTERRUPTA Gill. The Yellow Bass.

(No. 8467, U. S. National Museum; from Saint Louis, Missouri.)



MORONE AMERICANA (Gmelin). The White Perch.
(No. 15681, U. S. National Museum; from New York City.)

The Yellow Bass is rather common in river channels and ponds in the southern part of the basin of the Mississippi. It reaches a length of about a foot, and is considered a good food-fish. Our specimens are from St. Louis and from the White Water River, at Brookville, Indiana.

As the name *interrupta* was given by Mitchill to a variety of *Roccus lineatus*, a species of the same genus *Morone*, as then understood by us, the name *Morone interrupta* given to this species by Gill was replaced by a later name, *mississippiensis*. If, however, *Morone* and *Roccus* are regarded as distinct genera, the name *interrupta* is tenable for a species of the former group.

115. MORONE AMERICANA.

(THE WHITE PERCH; WHITE SEA-BASS.)

The River Perch of New York Schœpf, Schrift. der Gesells., nat. Freunde, VIII, 159, 1788 (New York).
Perca americana Gmelin, Syst. Nat., I, III, 1308, 1788 (after Schœpf.) (and of the various copyists).
Labrax americanus Holbrook, Ichth. S. C., ed. 1, 21, pl. 3, f. 2, 1856 (Charleston).
Morone americana Gill, Ichth. Rep. Capt. Simpson's Sur. Great Basin Utah, 397, 1876; Jordan, Annals N. Y. Ac. Sci., IV, No. 4, 97, 1876 (east-coast streams); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1878, 380 (New and Neuse Rs., N. C.).
Roccus americanus Gill, Proc. U. S. Nat. Mus., 1883, 366; Goode, Nat. Hist. Aquat. Anim., IV, 31, 1884.
Perca immaculata Walbaum, Artedi Genera Piscium, 330, 1788.
Morone rufa Mitchill, Rep. Fishes N. Y., 18, 1814 (New York).
Bodianus rufus Mitchill, Trans. Lit. and Phil. Soc. N. Y., I, 420, 1815 (New York).
Labrax rufus De Kay, Nat. Hist. N. Y., Fishes, 9, pl. 3, f. 7, 1842 (New York); Storer, Syn. Fishes N. Am., 22, 1846; Günther, I, 65, 1859 (Boston; New York).
Perca mucronata Rafinesque, Am. Month. Mag. and Crit. Rev., II, 205.
Labrax mucronatus Cuv. & Val., Hist. Nat. des Poissons, II, 86, pl. 121, 1828; Storer, Rep. Ichth. Mass., 8, 1839 (Boston and vicinity); Ayres, Boston Journ. Nat. Hist., IV, 257, 1842 (Setauket, Greenport, and Riverhead, Long Island); Baird, Rep. Fishes N. J. Coast, 8, 1854 (Cape May County, N. J.; Sing Sing, N. Y.; Croton R., N. Y.; Potomac R.).
Labrax nigricans De Kay, Nat. Hist. N. Y., Fishes, 12, pl. 50, f. 160, 1842 (Long Island); Storer, Syn. Fishes N. Am., 1846.
Morone pallida Mitchill, Rep. Fishes N. Y., 18, 1814 (New York).
Bodianus pallidus Mitchill, Trans. Lit. and Phil. Soc. N. Y., I, 420, 1815 (New York).
Labrax pallidus De Kay, Nat. Hist. N. Y. Fishes, II, Pl. I, f. 2, 1842 (New York); Storer, Syn. Fishes N. Am., 22, 1846; Günther, I, 67, 1859.

Habitat.—Atlantic coast of the United States, from Nova Scotia to South Carolina, ascending streams and frequently land-locked in ponds.

Etymology.—*Americana*, American.

This species is one of the most abundant and characteristic of the brackish waters and river mouths of our Atlantic coast. It is the smallest in size of the species of *Morone*, rarely reaching a length of a foot. It is a very excellent pan-fish, and it is everywhere known on the coast as the "White Perch." Our specimens are from Wood's Holl, New York, and Washington. Those from Wood's Holl represent the variety called *nigricans*, very dark green in color, scarcely paler below, the body deeper* and the spines lower and shorter than in the common White Perch.

* Head, $3\frac{1}{3}$ in length; depth, $2\frac{2}{3}$; fourth dorsal spine, $2\frac{2}{3}$ in head; second anal spine, $3\frac{1}{3}$. A. III, 9.

Genus XXXI.—ROCCUS.

Roccus Mitchill, Fishes of New York, 25, 1814 (*striatus* = *lineatus*).
Lepibema Rafinesque, Ichthyologia Ohiensis, 23, 1820 (*chrysops*).
Roccus Gill, Proc. Ac. Nat. Sci. Phila., 1860, 111.
Lepibema Steindachner, substitute for *Morone* and *Roccus*.

TYPE.—*Roccus striatus* Mitchill = *Sciæna lineata* Bloch.

Etymology.—From the vernacular, Rock-fish.

This group contains two species, about equally allied to *Morone* and to *Dicentrarchus*.

ANALYSIS OF SPECIES OF ROCCUS.

COMMON CHARACTERS: As in *Morone* except as follows:

Base of tongue with one or two patches of teeth; anal spines graduated; dorsal fins entirely separate; anal rays, III, 11 or 12; supraoccipital crest scarcely widened above; lower jaw projecting; spines rather slender.

a. Teeth on base of tongue in a single series; body rather deep and compressed, the depth more than one-third the length; back considerably arched (*Lepibema* Rafinesque); head subconical, slightly depressed at the nape; mouth moderate, nearly horizontal, the lower jaw little projecting; eye large, as long as snout, about 5 in head; maxillary reaching middle of pupil, 2⅔ in head; margin of subopercle with a deep notch; gill-rakers rather long and slender, x + 12; longest dorsal spine 2 in head; second anal spine 3; color silvery, tinged with golden below; sides with narrow, dusky lines, about five above the lateral line, one along it, and a variable number below it, these sometimes more or less interrupted or transposed. Head, 3½ in length; depth, 2½. D. IX—I, 14; A. III, 12 ..... CHRYSOPS, 116.

aa. Teeth on base of tongue in two parallel patches; body rather elongate, little compressed, the depth less than one-third the length; back little arched (*Roccus* Mitchill); head subconical; mouth large, oblique, the maxillary reaching to below middle of orbit, 2½ in head; eye about half the length of the rather sharp snout, 7 in head; margin of subopercle entire; suprascapula entire; maxillary naked; gill-rakers long and slender, 4 + 12; spines slenderer than in any other species; longest dorsal spine 2½ in head; second anal spine 5; color olivaceous, silvery, often brassy-tinged; sides paler, marked with seven or eight continuous blackish stripes, one of them along the lateral line. Head, 3½ in length; depth, 3½, varying considerably with age, the young being more slender. D. IX–I, 12; A. III, 11; Scales, 8-67-11..... LINEATUS, 117.

116. ROCCUS CHRYSOPS.

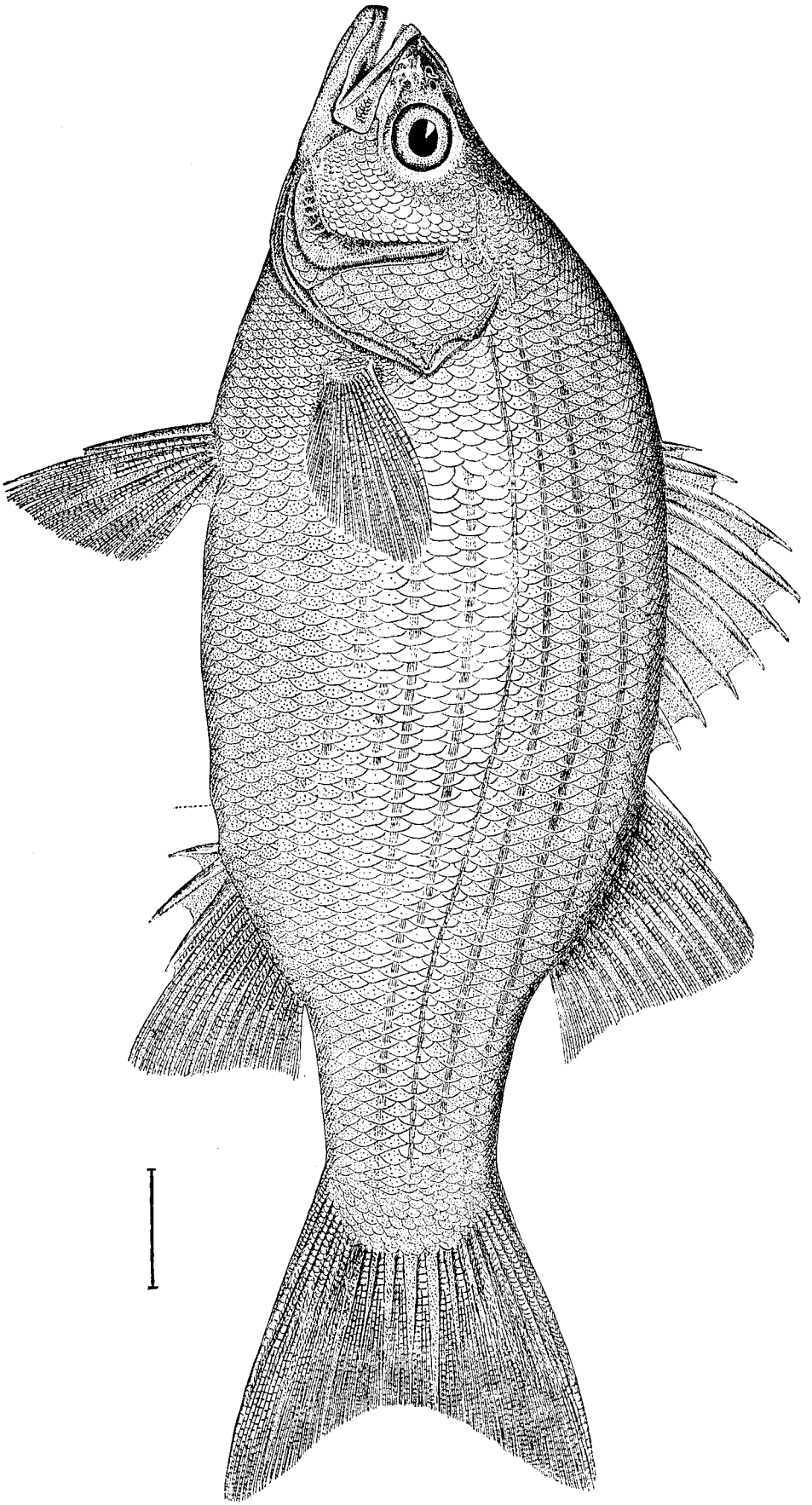
(THE WHITE BASS. WHITE LAKE-BASS.

Perca chrysops Rafinesque, Ichthyologia Ohiensis, 22, 1820 (Falls of the Ohio).

Labrax chrysops Gill, Proc. Ac. Nat. Sci. Phila., 1860, 20.

Roccus chrysops Gill, Proc. Ac. Nat. Sci. Phila., 1860, 113 (Racine; Toronto; southern Illinois) (not *Labrax chrysops* Girard; not *Labrax multilineatus* Günther, I, 501); Gill, Ichth. Rep. Captain Simpson's Sur. Great Basin Utah, 391, 1876; Cope, Proc. Ac. Sci. Phila., 1865, 83 (Saginaw Bay); Milner, Rep. U. S. Fish Com., 1872–'73, 76; Jordan, Man. Vert., 1876, 226; Nelson, Bull. Ills. Mus. Nat. Hist., 1876, 36; Jordan & Copeland, Bull. Buffalo Soc. Nat. Hist., 1876, 136; Jordan, Fishes Illinois, 44, 1877 (Lake Michigan; Quincy; Henry); Jordan & Gilbert, Klippart's Rept. Fish Commissioner Ohio, 1878; Jordan, Man. Vert., Ed. II, 1878; Jordan, Geol. Sur. Ohio, 955, 1882; Jordan, Annals N. Y. Ac. Sci., IV, No. 4, 97, 1876 (Lakes Winnebago, Erie, and Michigan; Fox and Miss. Rivers); Jordan & Brayton, Bull. U. S. Nat. Mus., 1873, 83 (Ohio and Illinois Rivers.); Jordan, Nat. Hist. Aquat. Anim., 428, 1884; Jordan & Gilbert, Proc. U. S. Nat. Mus., 1886, 12 (Washita and Saline Rivers, Arkansas).

Labrax multilineatus Cuv. & Val., Hist. Nat. des Poissons, III, 488, 1830 (Wabash River); Kirtland, Boston Journ., Nat. Hist., V, 21, pl. 7, f 1, 1845; Storer, Syn. Fishes N. Am. 22, 1846; Günther, I, 67, 1859 (Lake Erie; Ohio River).



ROCCUS CHRYSOPS (Rafinesque). The White Bass.

(No. 10826, U. S. National Museum; from Sandusky, Ohio.)

Labrax notatus (Hamilton Smith) Richardson, Fauna Boreali-Americana, III, 8, 1836; Storer, Syn. Fishes N. Am., 22, 1846; Günther, I, 67, 1859.

Labrax albidus De Kay, Nat. Hist. N. Y., Fishes, 13, pl. 51, f. 165, 1842 (Buffalo); Storer, Syn. Fishes N. Am., 23, 1846.

Labrax osculatii Filippi, Rev. et Mag. de Zoologie, 2d series, V. 164, 1853; Günther, I, 65, 1859.

Habitat.—Great Lake region, Upper Mississippi and Ohio Valleys, and northward.

Etymology.—*Χρυσός*, gold; *ωψ*, eye.

The White Bass is generally abundant in the Great Lakes, where it reaches a length of from 10 to 15 inches. In the Ohio and Mississippi Rivers it is less common, although it is frequently taken. It is more abundant northward, its southernmost limit being, so far as our collections show, the Washita River, in Arkansas. It frequents deep or still waters, seldom ascending small streams.

117. ROCCUS LINEATUS.

(STRIPED BASS; ROCK-FISH; ROCK.)

Sciæna lineata Bloch, Ichthyologia, IX, 53, pl. 305, 1792.

Labrax lineatus Cuv. & Val., Hist. Nat. des Poissons, II, 79, 1828 (New York); Richardson, Fauna Boreali-Americana, III, 10, 1836; Storer, Report Fishes of Mass., 7, 1839 (Boston and vicinity); Ayres, Boston Jour. Nat. Hist., IV, 707, 1842 (Long Island); De Kay, Zoöl. of N. Y., Fishes, 7, pl. 1, f. 3, 1842 (Long Island); Linsley, Cat. Fishes Conn.; Storer, Syn. Fishes N. Am., 21, 1846; Baird, Rep. on Fishes of N. J. Coast, 7, 1854 (Chesapeake Bay, Potomac, and Susquehanna Rivers); Holbrook, Ichth. S. C., 17, pl. 4, f. 2, 1855; Günther, I, 64, 1859.

Roccus lineatus Gill, Proc. Ac. Nat. Sci. Phila., 112, 1860; Gill, Ichth. Rep. Capt. Simpson's Sur. Great Basin Utah, 391, 1876; Jordan, Annals N. Y. Ac. Sci., IV, No. 4, 97, 1876 (Delaware and Potomac Rivers); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1878, 330 (Beaufort, N. C., and vicinity); Goode & Bean, Proc. U. S. Nat. Mus., 1879, 145 (Pensacola and vicinity); Goode, *op. cit.*, 115 (St. John's River, Fla.); Goode, Nat. Hist. Aquat. Ans., 425, 1884; Bollman, Proc. U. S. Nat. Mus., 1886, 465 (Escambia River).

Perca Rock-fish vel *Stricked Bass* Schœpf, Schrift. der Gesells. nat. Freunde, VIII, 160, 1788 (New York).

Perca saxatilis Walbaum, Artedi, Genera Piscium, 330, 1788 (after Schœpf).

Roccus saxatilis Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 599; Bean, Proc. U. S. Nat. Mus., 1883, 365.

Perca septentrionalis Bloch & Schneider, Systema Ichthyol., 90, pl. 70, 1801 (New York); Jordan, Proc. U. S. Nat. Mus., 1885, 72.

Roccus striatus Mitchill, Rep. Fishes N. Y., 25, 1815 (New York); Bean, Proc. U. S. Nat. Mus., 1884, 243 (Montgomery, Ala.).

Perca mitchilli Mitchill, Trans. Lit. and Phil. Soc., N. Y., I, 413, pl. 3, f. 4, 1814 (New York).

Lepibema mitchilli Rafinesque, Ichthyologia Ohiensis, 23, 1820.

Perca mitchilli interrupta Mitchill, Trans. Lit. and Phil. Soc. N. Y., 415, 1815 (New York).

Perca mitchilli alternata Mitchill, *l. c.*, 415, 1815 (New York).

Labrax schœnleini Peters, Berliner Monatsberichte, 1865, 95 (Celebes). (This is later stated by Peters to be probably identical with *Labrax lineatus*. If so, it certainly did not come from Celebes.)

Habitat.—Atlantic coasts of the United States, from New Brunswick to Pensacola, Florida, ascending all rivers in spring for the purpose of spawning. Occasional in Lake Ontario (Lewiston, Roosevelt). Introduced into California by the U. S. Fish Commission.

Etymology.—*Lineatus*, striped.

This species is one of the most important of the food-fishes of America. It is very abundant. It reaches a large size. Its flesh is excellent, and firm enough to bear

transportation and exposure to the air. It reaches a weight of 30 to 40 pounds. The largest one ever reported, according to Goode, was taken at Orleans, Massachusetts, and weighed 112 pounds.

The synonymy of the species admits of little doubt. It has been thought by some, the writers among the number, that the *Sciæna lineata* of Bloch was intended for *Dicentrarchus labrax* rather than for the present species. This opinion was based on the large size of the lower serræ on the preopercle as shown in Bloch's figure.

A later recomparison has convinced us that this species is really Bloch's *lineata*. It should therefore retain the name *lineatus* rather than the later *septentrionalis*.

Our specimens of *Roccus lineatus* are from Wood's Holl, Massachusetts; New York; Washington; and Pensacola, Florida. There is no doubt of its frequent occurrence in the Escambia River near Pensacola, and that the account given by Stearns (Nat. Hist. Aquat. Anim., 425) really belongs to this species.

Genus XXXII.—DICENTRARCHUS.

Labrax Klein, Missus, V, 25, 1749 (non-binomial).

Labrax Cuvier, Règne Animal, Ed. 2, 1829 (*lupus* = *labrax*) (not *Labrax* Pallas, 1810 = *Hexagrammus* Steller.)

Dicentrarchus Gill, Proc. Ac. Nat. Sci. Phila., 1860, 111 (*elongatus* = *labrax*).

TYPE.—*Perca elongata* Geoffroy = *P. labrax* L.

Etymology.—*Δίς*, two; *κέντρον*, spine; *ἀρχός*, anus, the typical species being wrongly described as having two anal spines.

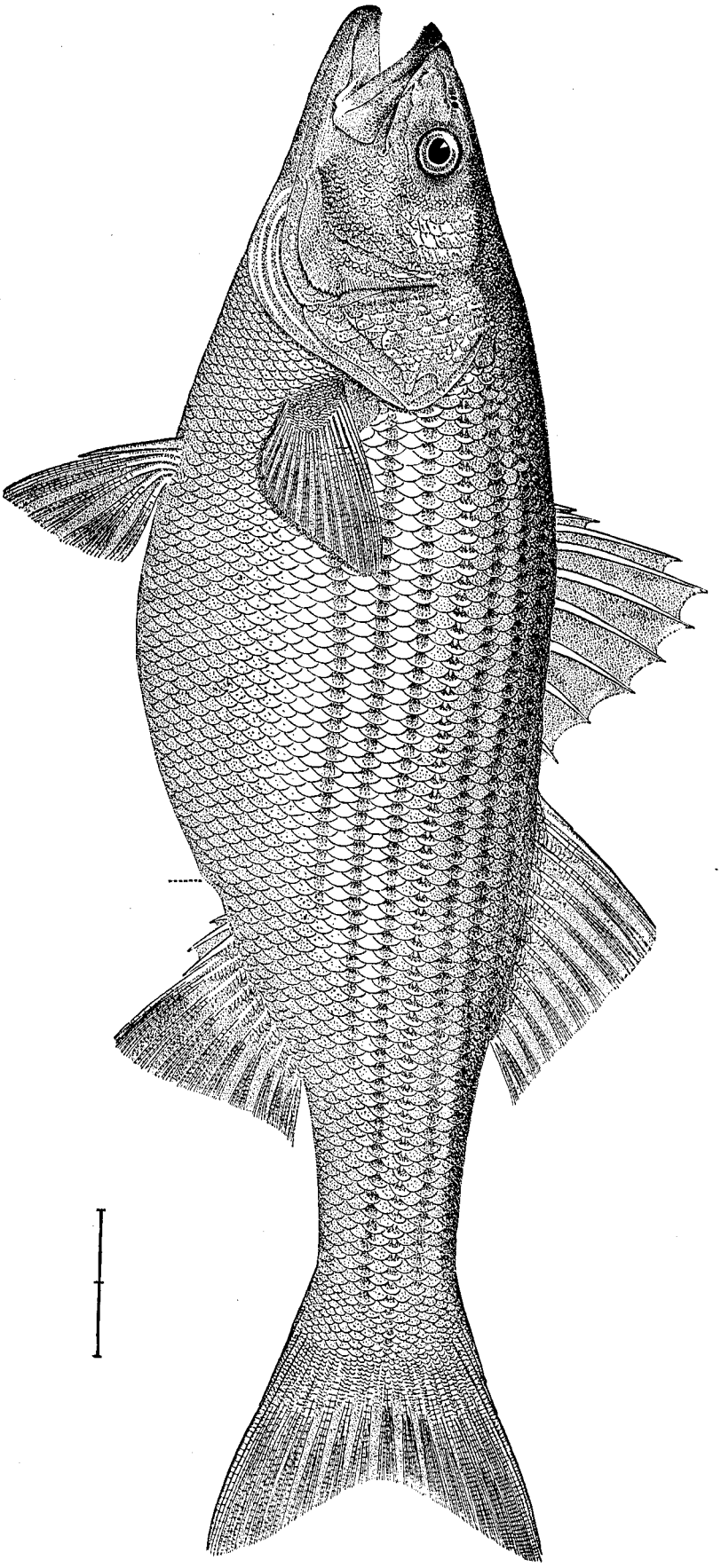
All the European and American species of the *Latinæ* (*Labracinæ*) have been usually referred to a single genus, for which the oldest binomial name is that of *Morone*. This genus was based originally on three species, erroneously supposed by Mitchill to differ from the genus *Perca* in having the ventral fins abdominal. These species are those now known as *Morone americana*, *Perca flavescens* and *Lepomis gibbosus*. The name has been newly defined by Dr. Gill and restricted to the first of these species, and according to current rules it has priority over all the other names applied to this group. The name *Labrax* is inadmissible in any event, unless the early names of Klein be admitted, because it has been previously used for a genus of fishes in another family.

Dr. Gill has taken the three principal groups or subgenera of *Morone* (called by us *Morone*, *Roccus*, and *Dicentrarchus*) as distinct genera. These groups are readily defined, but the actual differences are small. It is most convenient, on the whole, to regard them as distinct genera, at least for the purposes of the present paper.

The laws of priority render it necessary to retain for the European species the inappropriate name of *Dicentrarchus*.

ANALYSIS OF SPECIES OF DICENTRARCHUS.

COMMON CHARACTERS: Lower margin of preopercle with about three strong antrorse spines; supraoccipital crest broadened at its upper margin with a median groove; interorbital region broader and flatter than in the preceding; teeth on tongue in three long patches, one in the middle and one on each side; dorsals separate; anal spines graduated; dorsal spines slender; lower jaw slightly projecting; body rather elongate, the depth less than one-third the length; vertebræ 12 + 13 = 25 (*labrax*).



ROCCUS LINEATUS (Bloch). The Striped Bass.

(No. 25219, U. S. National Museum; from Washington, D. C.)

a. Vomerine teeth forming a simple subcrescentic transverse band (⌒-shaped); without backward prolongation on the median line; back not arched; mouth large, oblique, the maxillary reaching to below front of pupil, 2⅔ in head; eye 1½ in snout, 5 to 6 in head; spines on preopercle strong, gradually increasing to angle, three or four below angle larger, directed downward and forward; gill-rakers x + 14, long and slender; longest dorsal spine 2 in head; second anal spine 5 to 6; color olivaceous, the sides silvery, with narrow silvery streaks along the rows of scales; a large dusky shade on upper posterior margin of opercle; young with numerous round dusky spots. Head 3⅔ in length; D. IX–I, 12 or 13; A. III, 11; Lat. l. 66 to 74.....LABRAX, 118.

aa. Vomerine band of teeth with a backward prolongation on median line; back and sides with round black spots, which do not disappear with age.

b. [Vomerine band of teeth ⌒-shaped, with a very short backward prolongation on the median line; back and sides covered with small black spots; scales large. D. IX–I, 13; A. III, 11 or 12. Scales 57.] (*Günther.*).....ORIENTALIS, 119.

bb. [Vomerine band of teeth in a nail-shaped T-patch, the backward prolongation on the median line being very long; eye about 5 in head; snout sharply pointed; preopercle as in *D. labrax;* longest dorsal spine 2 in head; pectoral nearly 2; color olivaceous, with very distinct round black spots, somewhat diffuse on their edges, more or less regularly arranged, and not disappearing with age. Head 3½ in total length; depth about the same, D. IX-I, 13 or 14; A. III, 12. Scales 10–60–15.] (*Steindachner.*).....PUNCTATUS, 120.

118. DICENTRARCHUS LABRAX.

(SEA BASS OF EUROPE; BASS; ROBALO; VAILA.)

Perca radiis pinnæ dorsalis secundæ 14, etc, Artedi, Genera Piscium, 41, 1734.
Perca pinnis dorsalibus distinctis, etc., Gronow, "Act. Upsal., 1750, f. 39, t. 4."
Perca labrax Linnæus, Syst. Nat. Ed. X, 1758 290 Ed. 12, 482 (after Gronow and Artedi) (and of the early authors).
Sciæna diacantha Bloch, III, tafel 302.
Labrax diacanthus Gill, Proc. Ac. Nat. Sci. Phila., 1860, 110.
Centropomus lupus Lacépède Hist. Nat. Poiss., IV, 418, 1803.
Labrax lupus Cuvier, Règne Animal, Ed. 2, 1829; Cuv. & Val., II, 56, pl. 11; Günther, I, 64, and of Steindachner, Day, and nearly all recent European writers.
Perca elongata Geoffroy St. Hilaire, "Descr. Égypte, Poiss., pl. 19, f., 1."
Labrax elongatus Cuv. & Val. II, , 77.
Dicentrarchus elongatus Gill, Proc. Ac. Nat. Sci. Phila., 1860, 111.

Habitat.—Coasts of Europe, ascending rivers, ranging from the Mediterranean northward to Norway.

Etymology.—*Λάβραξ*, the ancient name, from *λάβρος*, gluttonous, the species being called the sea-wolf, or *lupus.*

The Bass of Europe is a very good food-fish, having habits very similar to those of our Striped Bass. It reaches a weight of ten or fifteen pounds.

119. DICENTRARCHUS ORIENTALIS.

Perca punctata Geoffroy St. Hilaire, Descr. Égypte, Poiss., pl. 20, f. 2 (Egypt) (not of *Linnæus*).
Labrax orientalis Günther, Am. Mag. Nat. Hist., 1863, 174 (Alexandria).

Habitat.—Shores of Egypt.
Etymology.—*Orientalis*, Oriental.

We have not seen this species and know it from Günther's description only.

120. DICENTRARCHUS PUNCTATUS.

Sciæna punctata Bloch, Ichthyologia, V, 64, 1793, taf. 305 (not *Perca punctata* L., which is *Bodianus fulvus*).

Perca punctata Bloch & Schneider, Syst. Ichth,. 1801, 91 (not of Linnæus, nor of Gmelin, who are quoted in synonymy)

Labrax punctatas Günther, Ann. Mag., Nat. Hist., 1863, 174 (Gibraltar); Brito Capello Jorn. Sci., Math.Phys. Lisboa, II, 154, 1867 (Lisbon); Steindachner, Ichthyol. Berichte, I, 1867, 5, (Porto, Lisbon, Cadiz, Malaga, Teneriffe); Steindachner, Fisch-fauna des Senegals, 1869, 3 (St. Louis, Senegal; Gorea).

Habitat.—Mediterranean Sea and adjacent waters.

Etymology.—*Punctatus*, dotted.

We have not studied this species and we draw our knowledge of it chiefly from the accounts of Günther and Steindachner. The specific name *punctatus* may be retained in spite of the fact that the name *Perca punctata* had been earlier applied by Gmelin to *Morone labrax*. This use of the name, *Perca punctata*, by Gmelin is evidently the result of a misprint. By some means the original description of *Perca punctata* L. has been left out, as also the name of the species next in order, *Perca labrax* L. By this means the name *Perca punctata* is left to stand over the description belonging to the other fish.

Genus XXXIII.—PERCICHTHYS.*

Percichthys Girard, Proc. Ac. Nat. Sci., 1854, 197 (*chilensis*).
Percosoma Gill, Proc. Ac. Nat. Sci. Phila., 1861, 51 (*melanops*).

TYPE.—*Percichthys chilensis* Girard.

Etymology.—*Perca* (πέρκη, perch); ἰχθύς, fish.

This genus is composed of fresh-water fishes inhabiting the rivers of Chili. We have studied but one of the species, and are not quite certain of the relations of the genus. Its external characters are similar to those of the *Latinæ*, though the general form of the body is remarkably like that of *Perca*. The following analysis of the species is chiefly a compilation, and it will probably be found of little value.

ANALYSIS OF SPECIES OF PERCICHTHYS.†

a. Branchiostegals seven; caudal peduncle long and slender, its length nearly three times its least depth; maxillary reaching to below middle of eye, 2⅔ in head; snout moderately pointed, 3⅔ in head; second dorsal spine 3¼ in head; second anal spine scarcely equal to eye; color olivaceous brown, more or less spotted with darker; preorbital, suborbital, mandible, and preopercle cavernous. D. XI–I, 13; A. III, 10. Scales, 9–66–16 ..... TRUCHA, 121.

* The distinction of the species of this genus has been questioned by Dr. Steindachner, who says: "In den Anden entspringenden Flüsse des südlichen und mittleren Theiles von Chile und Patagonien mit mehreren (wahrscheinlich nur zwei) Arten der *Perca*-ähnlichen Gattung *Percichthys* und *Percilia* bevölkert sind." (Ichth., Beitr., VII, 24.) Peters (Berl. Monatsber., 1866, 708) takes a very different view. He says: "Im Allgemeinen kann man wohl sagen, dass Chile arm an Süsswasserfischen ist, indessen ist ihre Zahl doch weit betrachtlicher als man bisher geglaubt hat. Im Werk von Gay ist von Percoiden die einzige *Perca trucha* aufgeführt, welche Girard in der United States Naval Astronomical Expedition als *Percilia chilensis* genauer beschreibt und abbildet. Derselbe fügt aus dieser Familie *Percichthys melanops* und *Percichthys gillissii* hinzu. Zwei andre Arten dieser Familie habe ich als *Perca pocha* und *P. segethi* beschrieben, und kann jetzt noch eine zweite Art *Percilia* hinzufügen so dass mir jetzt anstatt einer Percoidee deren sechs aus den Flüssen Chiles bekannt sind, ich glaube aber, dass es noch mehrere Arten *Percichthys* gibt."

† We are unable to find the description of *Perca pocha* and *Perca segethi* Peters, species of this group described by Professor Peters from Chili.

aa. Branchiostegals, 6; bones of lower part of head still more cavernous; caudal peduncle shorter and deeper.

c. [Caudal peduncle moderately long; opercular spine strong; maxillary reaching just past front of pupil; snout long, blunt in profile; soft dorsal and anal high, much higher than spinous part; second dorsal spine highest, about 2¼ in head; second anal spine longer than third; color yellowish brown, covered all over with small spots, one occupying the base of each scale. Head 2⅓ in length; depth, 3⅔. D. IX–I, 11; A. III, 9. Scales, about 65.] (*Jenyns.*)..... LÆVIS, 122.

cc. [Caudal peduncle short and thick; opercular spine small; maxillary reaching front of eye. Color whitish, minutely and densely dotted with black, the dots crowded in a blotch on the center of each scale. D. X–I, 10; A. III, 9. Scales, 10–59–22.] (*Girard.*) ..... MELANOPS, 123.

121. PERCICHTHYS TRUCHA.

(TRUCHA OF CHILI.)

Perca trucha Cuv. & Val., IX, 429, 1833 (Rio Negro, Patagonia); Guichenot in Gay, Historia de Chile, Zool., II, 146, pl. 16, f. 1 (Chili); Girard, Proc. Ac. Nat. Sci. Phila., 1854, 197.

Percichthys chilensis Girard, U. S. Nav. Astron. Exped., II, Zool., 231, pl. 29, f. 1–4 (Chili); Günther, I, 61, 1859.

? *Perca segethi* Peters (description not seen by us).

Habitat.—Rivers of Chili.

Etymology.—*Trucha*, the Spanish name, meaning trout (low Latin, *trutta*).

We know this species from a single specimen sent from the Museum of Comparative Zoölogy, and from others in the museum at Cambridge.

The following description is taken from specimens in the museum at Cambridge, labeled, whether correctly or not, *Percichthys trucha*. These specimens are No. 4836, M. C. Z., Santiago, Chili (ten specimens, 5 to 11 inches in length), and No. 10372, M. C. Z., Curicó, Chili (two specimens, 8 and 9 inches long). (C. H. E.)

Body oblong, deepest below first dorsal spine; maxillary reaching to below anterior half of pupil, 2⅔ to 3 in head. Maxillary and mandibulary teeth in similar bands, broadest in front and tapering backwards; a few of the inner teeth in front of lower jaw slightly enlarged, the rest subequal; teeth on vomer in a triangular patch; palatine bands of teeth much longer than those on vomer, separated from the latter, and placed almost at right angles with them. Head covered with scales forward to the anterior nostril, a short linear naked area, always present, at or near the base of the supra-occipital keel. Scales on cheeks in twelve to fifteen irregular series; scales on opercle as large as those on body, in about six series. Eye large, 1⅔ to 1⅘ in snout, 5 to 5⅔ in head; about equal to inter-orbital space. Mouth subterminal, the lower jaw slightly included. Profile straight, from tip of occipital process to premaxillary processes, then abruptly decurved.

Preorbital with strong teeth directed downward and backward, strongest in young examples, largest near posterior angle of maxillary; entire vertical margin of preopercle with fine teeth, largest below; lower margin of preopercle with larger, wider-set teeth, the anterior ones directed forward; posterior half of free edge of interopercle and lower half of subopercle with very fine teeth, which become more or less obsolete with age; opercle with a strong spine and a blunt or rounded point above it.

Gill-rakers short, chubby, about two-thirds the length of the pupil, 6 + 13; inner side of the gill-rakers covered with short, stout teeth.

Distance of first dorsal spine from tip of snout, $2\frac{3}{5}$ in length of body. First dorsal spine less than half the length of the second, the second from one-half to two-thirds length of the third spine, which is the highest, $2\frac{1}{5}$ in head, the spines decreasing in height to the ninth; the spinous and soft dorsals connected. Caudal in the young slightly emarginate; in the adult emarginate, the upper part truncate, lower rounded. First anal spine inserted under second dorsal ray, the spines graduated, the second strongest; highest ray 2 to $2\frac{1}{4}$ in head. Ventral inserted below the base of lower pectoral rays, the second divided ray longest, $2\frac{1}{5}$ to $1\frac{4}{5}$ in head. Pectoral 2 to $1\frac{4}{5}$ in head.

Scales of body of about uniform size, becoming very much smaller on breast and top of head. Scales strongly ctenoid on sides, becoming cycloid on head.

Small scales on the caudal membrane at its basal third. Anal and dorsal without scales.

Color olivaceous yellow, with peppery black dots, aggregated in spots on the back; the scales along base of dorsal and the upper half of caudal peduncle with a brownish spot at their base, spots forming more or less regular longitudinal lines; membrane of soft dorsal with minute brownish dots, aggregated in places into rather large spots. Membrane of caudal dusky; anal with brownish dots along the middle of the membranes; pectorals and ventrals with similar, but fewer, spots. Head, $3\frac{2}{5}$ in length, to base of caudal; depth, 4 to $4\frac{2}{5}$. D. X, 11 or 12; A. III, 8 to 10. Scales, 9–66 to 67–17. (C. H. E.)

122. PERCICHTHYS LÆVIS.

Perca lævis Jenyns, Voyage of the Beagle, Fishes, I, pl. 1, 1840 (Rio Santa Cruz, Patagonia).
Percichthys lævis Günther, I, 61, 1859 (copied); Kner, Novara, Fische, I, 11 (Valparaiso).

Habitat.—Rivers of Chili.

Etymology.—*Lævis*, smooth.

This species is known to us chiefly from the figure of Jenyns and the description given by Kner.

123. PERCICHTHYS MELANOPS.

Percichthys melanops Girard, Proc. Ac. Nat. Sci. Phila., 1854, 197; Girard, U. S. Nav. Astron. Exped., II, Zool., 233, pl. 30, figs. 1–5 (Rio Maypu, Chili); Günther, I, 61, 1859 (copied).
Percosoma melanops Gill. Proc. Ac. Nat. Sci. Phila., 1860, 51 (copied).
? *Perca pocha* Peters (description not seen by us).

Habitat.—Rivers of Chili.

Etymology.—*Μέλας*, black; *ὄψις*, appearance, from the dusky coloration.

This species is known to us from descriptions only.

PERCICHTHYS POCHA.

In the museum at Cambridge are sixteen specimens from Curicó, Chili. These are from 5 to 8 inches in length and bear the label *Percichthys pocha*. The following is a description of this species. (C. H. E.)

Body ovate, deepest below first dorsal spine. Maxillary reaching scarcely to vertical from anterior margin of orbit, 3 in head. Teeth of lower jaw in a band widest near tip, and tapering to a single series behind; some of the lateral teeth

longer than the others; teeth of upper jaw in a broader band, those of the sides not in a single series; teeth all about equal; teeth on vomer in a very narrow, crescent-shaped patch; those on palatines in a band much narrower and shorter than that on the vomer. Mouth oblique, the jaws subequal, the lower slightly included. Head scaled forward to the anterior nostril; scales on cheek in about eight series, those on opercle about as large as those on body, in about six series. Profile straight, from anterior margin of orbit to tip of occipital crest, rounded in front and behind. Eye $1\frac{1}{2}$ in snout, $4\frac{1}{2}$ to 5 in head; interorbital area a little wider than eye. Preorbital minutely serrated, the serræ weaker than in *P. trucha*. Preopercle with minute teeth on its vertical border, the teeth near the angle sometimes very much enlarged, sometimes little enlarged, more numerous than in *P. trucha*; serration of the subopercle and preopercle scarcely visible; opercular spine placed higher than in *P. trucha*, its tip sometimes incompletely two or three parted; a bluntish projection on opercle above the spine. Gill-rakers very short, about equal to one third diameter of eye, 6 + 11. Distance of first dorsal spine from snout $1\frac{3}{7}$ to $1\frac{4}{7}$ in length. Height of dorsal spines variable, the first always less than half as long as the second, the third or fourth dorsal spine highest, 2 to 3 in head, the spines decreasing in height to the ninth; spinous and soft dorsal connected. Caudal truncate when spread out, emarginate when closed. Anal inserted below the beginning of the soft dorsal, its spines graduated, the second thickest; highest ray about half as long as the head; ventral $1\frac{2}{7}$ in head; pectoral $1\frac{1}{2}$ to $1\frac{2}{7}$ in head.

Scales on the body of about equal size, less strongly ctenoid than in *P. trucha*, reduced on breast and head. Lateral line much more strongly curved than in *P. trucha*.

Color brownish, golden-yellow below, everywhere with brownish dots; those on the lower half of the body scattered with usually a light (blue?) center, a dusky spot at the base of each scale on the sides; all the fins dusky, with reddish brown dots; those on the base of the soft dorsal sometimes aggregated into spots. Head, 3 to $3\frac{1}{4}$ in length to base of caudal; *depth* 3 *to* $3\frac{1}{4}$. D. X, 11 or 12; A. III, 9 or 10. Scales, 10 or 11–54 to 58–19 or 20.

This species must be very close to the one called *Percichthys melanops*, if not identical with it.

Genus XXXIV.—PERCILIA.

Percilia Girard, Proc. Ac. Nat. Sci. Phila., 1854, 197 (*gillissi*).

TYPE.—*Percilia gillissi.*

Etymology.—Percilia, a diminutive of *Perca.*

This genus contains a single species in the rivers of Chili. We know it only through imperfect descriptions, and we are not sure that it is really an ally of *Percichthys*. None of the species are in the Museum at Cambridge.

ANALYSIS OF SPECIES OF PERCILIA.

a. [First dorsal with nine spines; snout short and rounded; maxillary reaching front of eye; branchiostegals 5 or 6; teeth small, conical; operculum without spines; a few minute spines along edge of preopercle. Color brownish, spotted with black. D. IX–I, 10; A. III, 8. Lat. l., 35.] (*Girard.*)

GILLISSI, 124.

aa. [First dorsal with seven spines; anterior profile evenly and rather strongly curved; back regularly and more gently arched; eye 3½ in head; forehead scaleless; lateral line abruptly bent below second dorsal. Head, 4½ in length with caudal; depth, 5½. D. VII, I, 10; A. III, 7. Scales, large, rough. Color, grayish above, paler below, becoming yellowish anteriorly.] (*Peters.*)
GRACILIS, 125.

124. PERCILIA GILLISSII.

Percilia gillissii Girard, Proc. Ac. Nat. Sci. Phila., VII, 1854, 197 (Rio de Maypu, Chili); Girard, U. S. Nav. Astron. Exped., Zool., 235 (Rio de Maypu); Günther, I, 255, 1859 (copied).

Habitat.—Rivers of Chili.

Etymology.—Named for Lieutenant Gilliss, of the U. S. Naval Astronomical Expedition.

This species is known to us from the scanty original description only.

125. PERCILIA GRACILIS.

Percilia gracilis Peters, Berliner Monatsberichte, 1866, 708 (Rio Reine, Santiago de Chili).

Habitat.—Rivers of Chili.

Etymology.—*Gracilis*, slender.

This species is known from Dr. Peters's description only. It is probably identical with *Percilia gillïssii.*

REVIEW OF THE SERRANIDÆ.

RECAPITULATION.

The following is a list of the species of *Serranidæ* recognized by us as occurring in the waters of America and Europe. The distribution in general of each species is indicated by the use of the following letters:

E. Europe.
I. Islands of Eastern Atlantic: Azores, etc.
N. Atlantic coast, north of Cape Hatteras.
S. South Atlantic and Gulf coast.
B. Bassalian Fauna of Atlantic.
W. West Indies.
C. California.
P. Pacific coast of Mexico and Central America.
F. Rivers of North America.
B. Coasts of Brazil.
T. Patagonia, east coast.
A. Rivers of South America, Amazon.
V. Pacific coast of South America.

Subfamily I.—RYPTICINÆ.

Genus I.—RYPTICUS Cuvier.

§ PROMICROPTERUS Gill.

1. *Rypticus bistrispinus* (Mitchill). S.
2. *Rypticus nigripinnis* (Gill). P.

§ RYPTICUS.

3. *Rypticus xanti* (Gill). P. (Perhaps identical with the next.)
4. *Rypticus bicolor* (Valenciennes). V.
5. *Rypticus saponaceus* (Bloch & Schneider). W, S, I, B.
6. *Rypticus arenatus* (Cuv. & Val.) B, W.
7. *Rypticus coriaceus* (Cope). W.
8. *Rypticus nigromaculatus* (Steindachner). W. (Probably a variation of *R. arenatus.*)

Subfamily II.—EPINEPHELINÆ.

Genus II.—POLYPRION Cuvier.

9. *Polyprion cernium* Cuvier. E, A, I, B.
10. *Polyprion oxygeneios* (Bloch & Schneider). V. (Possibly to be called *P. americanus.*)

Genus III.—STEREOLEPIS Ayres.

11. *Stereolepis gigas* Ayres. C.

Genus IV.—HEMILUTJANUS Bleeker.

12. *Hemilutjanus macropthalmos* (Tschudi). V.
13. *Hemilutjanus paytensis* (Lesson). V. (Doubtful species, uncertain as to genus.)

Genus V.—GONIOPLECTRUS Gill.

14. *Gonioplectrus hispanus* (Cuv. & Val.) W.

Genus VI.—GILBERTIA Jordan.

15. *Gilbertia semicincta* (Cuv. & Val.) V.

Genus VII.—ACANTHISTIUS Gill.

16. *Acanthistius brasilianus* (Cuv. & Val.). B.
17. *Acanthistius patachonicus* (Jenyns.) T.

Genus VIII.—ALPHESTES Bloch & Schneider.

18. *Alphestes multiguttatus* (Günther.) P.
19. *Alphestes afer* (Bloch.) W, B.
20. *Alphestes? pictus* (Tschudi.) V. (Species doubtful.)

Genus IX.—EPINEPHELUS (Bloch.) W, B.

§ EPINEPHELUS.

21. *Epinephelus analogus* (Gill). P.
22. *Epinephelus adscensionis* (Osbeck). S, W, B, I.
23. *Epinephelus catus* (Cuv. & Val.). S, W, B.
24. *Epinephelus drummond-hayi* (Goode & Bean). S, W.
25. *Epinephelus labriformis* (Jenyns). P.
26. *Epinephelus striatus* (Bloch). S, W, B.
27. *Epinephelus niveatus* (Cuv. & Val.). S, W, B.
28. *Epinephelus flavolimbatus* (Poey). S, W.
29. *Epinephelus aspersus* Jenyns. I. (Doubtful species.)
30. *Epinephelus goreensis* (Cuv. & Val.). I.
31. *Epinephelus chrysotænia* (Doderlein). E.
32. *Epinephelus caninus* (Valenciennes). I, E.
33. *Epinephelus alexandrinus* (Cuv. & Val.). E.
34. *Epinephelus æneus* (St. Hilaire). E.

35. *Epinephelus gigas* (Brünnich). E, I, B.
36. *Epinephelus mystacinus* (Poey). W.
37. *Epinephelus morio* (Cuv. & Val.). S, W, B.

§ GARRUPA Jordan.

38. *Epinephelus nigritus* (Holbrook). S.
39. *Epinephelus merus* (Poey). W, B, E. (Probably identical with the preceding.)

Genus X.—PROMICROPS Gill.

40. *Promicrops guttatus* (Linnæus). S, W, B.

Genus XI.—MYCTEROPERCA Gill.

§ MYCTEROPERCA.

41. *Mycteroperca olfax* (Jenyns). V.
ruberrima Jordan. V.
42. *Mycteroperca rosacea* (Streets). P.
43. *Mycteroperca falcata* Poey. W.
phenax Jordan & Swain. S.
44. *Mycteroperca calliura* Poey. W.
45. *Mycteroperca tigris* (Cuv. & Val.). W.
camelopardalis. Poey. W.

§ TRISOTROPIS Gill.

46. *Mycteroperca venenosa* (Linnæus). S, W, B.
apua (Bloch). S, W, B.
47. *Mycteroperca bonaci* (Poey). S, W, B.
xanthosticta Jordan & Swain. S.
48. *Mycteroperca jordani* (Jenkins & Evermann). P.
49. *Mycteroperca microlepis* (Goode & Bean). S.
50. *Mycteroperca interstitialis* (Poey). W. (Synonymy rather doubtful.)
51. *Mycteroperca dimidiata* (Poey). W.
52. *Mycteroperca xenarcha* Jordan. V.

§ PAREPINEPHELUS Bleeker.

53. *Mycteroperca rubra* (Bloch). (Possibly includes two species, *ruber* and *acutirostris*.)

Genus XII.—DERMATOLEPIS Gill.

54. *Dermatolepis angustifrons* (Steindachner). W. (Doubtful species, of uncertain relations.)
55. *Dermatolepis inermis* (Cuv. & Val.). W.
56. *Dermatolepis punctatus* Gill. P.

Genus XIII.—BODIANUS Bloch.

§ PETROMETOPON Gill.

57. *Bodianus panamensis* (Steindachner). P.
58. *Bodianus cruentatus* (Lacépède). S, W, B.
coronatus (Cuv. & Val.). S, W, B.

§ ENNEACENTRUS Gill.

59. *Bodianus tæniops* (Cuv. & Val.). S.
60. *Bodianus fulvus* (Linnæus). S, W, B.
ruber (Bloch). S, W, B.
punctatus (Linnæus). S, W, B.

§ MENEPHORUS Poey.

61. *Bodianus dubius* (Poey). W.

Genus XIV.—PARANTHIAS.

62. *Paranthias furcifer* (Cuv. & Val.). W, P.

Subfamily III.—SERRANINÆ.

Genus XV.—HYPOPLECTRUS Gill.

63. *Hypoplectrus lamprurus* Jordan & Gilbert. P.
64. *Hypoplectrus puella* Cuv. & Val. W.
vitulinus Poey. W.
pinnivarius Poey. W.
maculiferus Poey. W.
guttavarius Poey. W.
gummigutta Poey. W.
aberrans Poey. W.
accensus Poey. W.
affinis Poey. W.
chlorurus Cuv. & Val. W.
nigricans Poey. W, S.
indigo Poey. W.
bovinus Poey. W.
65. *Hypoplectrus crocotus* (Cope). W. (Doubtful species.)
66. *Hypoplectrus gemma* Goode & Bean. S. (Doubtful species.)

Genus XVI.—PARALABRAX Girard.

67. *Paralabrax nebulifer* Girard. C.
68. *Paralabrax maculatofasciatus* (Steindachner). C, P.
69. *Paralabrax albomaculatus* (Jenyns). V, P.
70. *Paralabrax humeralis* (Cuv. &. Val.). V.
71. *Paralabrax clathratus* Girard. C.

Genus XVII.—CENTROPRISTIS Cuvier.

§ CENTROPRISTIS.

72. *Centropristis striatus* (Linnæus). N, S.
atrarius L. S. (Doubtful subspecies.)
73. *Centropristis ocyurus* (Jordan & Evermann). S.

§ TRILOBURUS Gill.

74. *Centropristis philadelphicus* (Linnæus). S.

Genus XVIII.—CRATINUS Steindachner.

75. *Cratinus agassizii* Steindachner. V.

Genus XIX.—DULES Cuvier.

76. *Dules auriga* Cuv. & Val.. B.

Genus XX.—PARACENTROPRISTIS Klunzinger.

77. *Paracentropristis hepatus* (Linnæus). E.

Genus XXI.—DIPLECTRUM Holbrook.

§ DIPLECTRUM.

78. *Diplectrum formosum* (Linnæus). S, W, B.

§ HALIPERCA Gill.

79. *Diplectrum eurypleetrum* (Jordan & Bollman). P
80. *Diplectrum macropoma* (Günther). P.
81. *Diplectrum radiale* Quoy & Gaimard. W, B, P.
82. *Diplectrum conceptione* Cuv. & Val. V.

Genus XXII.—SERRANUS Cuvier.

§ PRIONODES Jenyns.

83. *Serranus subligarius* (Cope). S. (Possibly not a distinct species.
84. *Serranus flaviventris* (Cuv. & Val.). W, B.
85. *Serranus annularis* (Günther). B.
86. *Serranus atrobranchus* (Cuv. & Val.). B.
87. *Serranus æquidens* Gilbert. P.
88. *Serranus fusculus* (Poey). W.
89. *Serranus phœbe* (Poey). W, S.
90. *Serranus psittacinus* (Valenciennes). P, V.
91. *Serranus tigrinus* (Bloch). W.
92. *Serranus tabacarius* (Cuv. & Val.). W.
93. *Serranus flavescens* (Cuv. & Val.). W. (Species imperfectly known.)
94. *Serranus peruanus* (Lesson). V. (Species imperfectly known.)

§ MENTIPERCA Gill.

95. *Serranus stilbostigma* Jordan & Bollman. V.
96. *Serranus castelnaui* Jordan. B. (Species imperfectly known.)
97. *Serranus luciopercanus* (Poey). W.

§ SERRANELLUS Jordan.

98. *Serranus scriba* (Linnæus). E, I.
99. *Serranus atricauda* (Günther). I.

§ SERRANUS.

100. *Serranus cabrilla* (Linnæus). E, I.

Subfamily IV.—ANTHIINÆ.

Genus XXIII.—PRONOTOGRAMMUS Gill.

§ HEMIANTHIAS Steindachner.

101. *Pronotogrammus peruanus* (Steindachner). V, P.

§ PRONOTOGRAMMUS.

102. *Pronotogrammus vivanus* (Jordan & Swain). S.
103. *Pronotogrammus eos* Gilbert. P.
104. *Pronotogrammus multifasciatus* Gill. P.

Genus XXIV.—ANTHIAS Bloch.

105. *Anthias anthias* (Linnæus). E, I.

Genus XXV.—ODONTANTHIAS Bleeker.

106. *Odontanthias martinicensis* (Guichenot). W.
107. *Odontanthias asperilinguis* (Günther). B.
108. *Odontanthias? tonsor* (Cuv. & Val.). (Species of uncertain genus.)

Genus XXVI.—BATHYANTHIAS Günther.

109. *Bathyanthias roseus* Günther. B.

Genus XXVII.—CALLANTHIAS Lowe.

110. *Callanthias peloritanus* (Cocco). E, I.

Subfamily V.—LATINÆ.

Genus XXVIII.—LATES Cuvier.

111. *Lates niloticus* (Gmelin). Nile region.

Genus XXIX.—KUHLIA Gill.

112. *Kuhlia argo* Jordan & Bollman. P.
113. *Kuhlia xenura* (Jordan & Gilbert). P.? Habitat uncertain; may be from China).

Genus XXX.—MORONE Mitchill.

114. *Morone interrupta* Gill. F.
115. *Morone americana* (Gmelin). N.

Genus XXXI.—ROCCUS Mitchill.

§ LEPIBEMA Rafinesque.

116. *Roccus chrysops* (Rafinesque). F.

§ ROCCUS.

117. *Roccus lineatus* (Bloch). N, S, F.

Genus XXXII.—DICENTRARCHUS Gill.

118. *Dicentrarchus labrax* (Linnæus). E.
119. *Dicentrarchus orientalis* (Günther). Nile region.
120. *Dicentrarchus punctatus* (Bloch). E, I.

Genus XXXIII.—PERCICHTHYS Girard.

121. *Percichthys trucha* (Cuv. & Val.) Chili.
122. *Percichthys lævis* (Jenyns). Chili.
123. *Percichthys melanops* Girard. Chili.

Genus XXXIV.—PERCILIA Girard.

124. *Percilia gillissi* Girard. Chili.
125. *Percilia gracilis* Peters. Chili.

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INDEX.