

NOTES ON THE FISHES OF BEAUFORT HARBOR, NORTH CAROLINA.

By DAVID S. JORDAN and CHARLES H. GILBERT.

In the Proceedings of the Philadelphia Academy of Natural Sciences for 1877, pp. 203-218, is a paper entitled "Notes on the Natural History of Fort Macon, N. C., and Vicinity (No. 3)," by Dr. H. C. Yarrow, which treats of the species of fishes obtained by Drs. Coues and Yarrow in Beaufort Harbor and neighboring waters during the period of their residence at Fort Macon.

During the past summer (1878), the writers, accompanied by Prof. A. W. Brayton and a party of students from Butler University, spent three weeks in the month of August at Beaufort, the chief business of the party being the collection of fishes. We obtained, in all, about seventy-five species, many of which are not included in Dr. Yarrow's list.

For the purpose of making as complete a showing of the Ichthyology of the North Carolina coast as possible, we here include not only the species which we have ourselves observed, but also those taken by Drs. Coues and Yarrow. Brief notes on the local habits or distribution of each species are given, as well as occasional critical remarks on the nomenclature. The sequence and nomenclature are essentially as in Professor Gill's Catalogue of the Fishes of the East Coast of North America, 1873. The vernacular names here given are only those used by the Beaufort fishermen.

Family LOPHIIDÆ.

Genus LOPHIUS Linn.

1. *Lophius piscatorius* L.—*All-mouth*.

(*Lophius americanus* Gill, l. c.)

Not seen alive; two sets of jaw-bones picked up on the beach below Cape Lookout. Said to be occasionally taken by the fishermen. Until some evidence other than the difference of habitat is offered to show that the American "Angler," *Lophius americanus* DeKay, is distinct from the European *Lophius piscatorius* L., it seems to us that the burden of proof is on the side of the doubtful species. It seems better to consider the two forms on opposite sides of the Atlantic as identical until proved to be distinct, rather than distinct until proved to be identical. In the case of this and numerous other northern fishes of wide range, Dr. Gill (l. c.), on the contrary, has "preferred to retain the names given to the American forms as distinct species, although he is inclined to believe that they will eventually be found to be co-specific with other forms."

DIODONTIDÆ.

Genus CHILOMYCTERUS Bibron.

2. *Chilomycterus geometricus* (L.) Kaup.—*Swell-toad*.

Very abundant; taken in every seine; sold by small boys as curiosities, at from one to five cents each.

TETRODONTIDÆ.

Genus LAGOCEPHALUS Swainson (Gill).

(*Tetrodon* Gill, l. c. The genus *Tetrodon*, as first restricted by Swainson, is essentially equivalent to *Arothron* Müller, which differs from *Lagocephalus* in its closed nasal tentacles. The name *Lagocephalus* is therefore accepted by Professor Gill for the present genus.)

3. *Lagocephalus lævigatus* (L.) Gill.

Found by Dr. Yarrow "in small streams running through salt marshes. But few seen."

Genus CIRRISOMUS Swainson.

(*Chilichthys* Müller, Gill, l. c. The genus *Cirrisomus* of Swainson (1839) is based on *Chilichthys spengleri* (*Tetrodon spengleri* Bloch), and therefore antedates and must supersede *Chilichthys* Müller (1841).)

The name is given in allusion to the short, fleshy appendages or barbels along the sides in the typical species. These are not found in the other species of the genus, but the name cannot be set aside on that account. *Chilichthys* may perhaps be retained as a subgeneric name for those species without fleshy lips.

Cirrisomus differs from *Lagocephalus* chiefly in the form of the fins. In the latter genus, the dorsal and anal are falcate, of 11 to 14 rays each, and the caudal fin is forked. In *Cirrisomus*, these fins are all more or less rounded, and the dorsal and anal contain but 6 to 8 rays each. In *Lagocephalus*, the body is elongate, the caudal peduncle especially so, the skin comparatively smooth, except on the inflated part of the abdomen. There is a fold of skin along each side of the tail below (usually well marked, but nearly obsolete in *L. larvigatus*). The coloration is peculiar, the skin having a metallic lustre. In *Cirrisomus*, the body is comparatively short and broad, with short caudal peduncle. There is usually no fold along the lower side of the tail. The coloration is usually variegated, and without metallic lustre, and the prickles are variously arranged. Four species of *Cirrisomus* are found on our Atlantic coast: *C. turgidus* (L.), *C. testulineus* L., *C. trichocephalus* (Cope), and *C. spengleri* (Bloch). The first is common; the others are rare, or occasional visitants.

4. *Cirrisomus turgidus* (L.) Jor. & Gill.—*Swell-toad*; *Puffer*.

Very common everywhere about Beaufort; taken in the nets with *Chilomycterus geometricus*.

OSTRACIIDÆ.

Genus LACTOPHRYS Swainson.

5. *Lactophrys trigonus* (L.) Poey.

A specimen in the State Museum at Raleigh, from Beaufort. Two specimens were found on the beach at Fort Macon by Dr. Yarrow. Numerous specimens of another species (*Lactophrys quadricornis* (L.)), from the coast of South Carolina, are in the U. S. National Museum. This is a common West Indian species, not before recorded from our coast.

BALISTIDÆ.

Genus ALUTERA Cuvier.

6. *Alutera cuspidata* DeKay.—*Fool-fish*.

Rather common in Beaufort Harbor. Numerous specimens obtained.

7. *Alutera aurantiaca* (Mitchill) Jor. & Gilb.—*Fool-fish*.

(*Ceratacanthus aurantiacus* Gill, l. c.)

Rather common; with the preceding. We find no warrant for the genus *Ceratacanthus* Gill, based on this species. It is certainly very closely related to the preceding.

Genus STEPHANOLEPIS Gill.

The genus *Stephanolepis* of Gill is essentially equivalent to *Monacanthus* as properly restricted by Bleeker and others. In this large genus there are two types, which may be called genera, each represented on our coast by one species. One of these, which contains the most of the species, and for which the name of *Stephanolepis* may be retained, has the abdominal flap small, and not exceeding the ventral spine. *Monacanthus* proper has the abdominal flap greatly developed, much exceeding the spine. *Monacanthus setifer* Bennett, of the former group, is very common on our coast. *Monacanthus occidentalis* Günther, of the latter group, is probably a straggler from the West Indies. *Canthorhinus* Swainson, occasionally used for this latter group, is apparently synonymous with *Liomonacanthus* Bleeker, over which name it has priority. *Canthorhinus*, thus defined, differs from *Monacanthus* in having the ventral spine immovable, and the dorsal spine without barbs.

8. *Stephanolepis setifer* (Bennett) Gill.—*Common Fool-fish*.

One of the commonest fishes in Beaufort Harbor, swarming everywhere about the wharves.

HIPPOCAMPIDÆ.

Genus HIPPOCAMPUS Cuvier.

9. *Hippocampus antiquorum* Leach.

Not common. Preserved by fishermen as a curiosity, and sold to visitors at about twenty-five cents each.

SYNGNATHIDÆ.

Genus SIPHONOSTOMA Rafinesque (Gill).

10. *Siphonostoma fuscum* (Storer) Jor. & Gill.*(Syngnathus fuscus et peckianus Storer.)*

Very common among weeds along the Beaufort shore. The specimens taken were all small. Drs. Cones and Yarrow found this species and others of which we obtained many specimens, "rare," and *vice versa*. The chief reason of this discrepancy is found in the fact that our headquarters were in the village of Beaufort on the mainland, and our chief collections of small fishes were made among the wharves. Their headquarters were at Fort Macon, on one of the long sand islands or sandspits which make such a characteristic feature of the North Carolina coast. On this outer island, "Fool-fish," "Pipe-fish," Blennies, and the like, are not found.

FISTULARIIDÆ.

Genus FISTULARIA Linn.

11. *Fistularia tabaccaria* L.

Two specimens observed by Dr. Yarrow.

SOLEIDÆ.

Genus APHORISTIA Kaup.

12. *Aphoristia plagiusa* (L.) Jor. & Gill.

Abundant. Many young specimens taken on the sand-shoals. This species belongs to *Aphoristia*, and not to *Plagusia*, as the latter genus is restricted by Kaup and Günther. The proper orthography of the specific name is apparently *plagia*, not *plagiusa*, unless the latter was originally a misprint for *plagusia*.

Genus ACHIRUS Lacépède.

13. *Achirus lineatus* (L.) Cuv.

But one specimen seen by us at Beaufort. We obtained this Sole in the Neuse River, at Goldsboro', in completely fresh water, with *Belone longirostris*, *Ioa vitrea*, *Alcórdius crassus*, *Noturus cleutherus*, *Boleosoma maculaticeps*, *Luxilus chlorocephalus*, *Zygonectes atrilatus*, *Hybognathus nuchalis*, *Micropterus pallidus*, etc.

PLEURONECTIDÆ.

Genus PSEUDOPLEURONECTES Bleeker.

14. *Pseudopleuronectes americanus* (Walb.) Gill.

Rare (Yarrow). Not seen by us.

Genus PSEUDORHOMBUS Bleeker.

(*Chanopsetta* and *Ancylopsetta* Gill.)

In Professor Gill's Catalogue of the Fishes of the East Coast of North America, from Greenland to Georgia (Proc. Acad. Nat. Sci. Phila. 1861), many new genera are proposed without description or remark, most of them being defined at a later period. Two of the genera of Flounders there noted, *Chanopsetta* and *Reinhardtius* (proposed in 1861; defined in 1864), are apparently identical with *Pseudorhombus* and *Platysomatichthys* of Bleeker, proposed and defined in 1862. It is necessary, therefore, to substitute the latter ill-chosen names for the preferable names of Dr. Gill, if we hold with the present writers (and most others,—see Dall, Nomenclature of Zoölogy and Botany, 1877, pp. 17, 35) that a generic name *without a diagnosis*, placed before the names of one or more species, has no more claim on our recognition than an unpublished manuscript name. The adoption of either is a matter of courtesy or convenience, not of duty.

If the Pacific coast genus *Paralichthys* is truly sinistral, as supposed by Dr. Gill (Proc. Ac. Nat. Sci. Phila. 1864, 197), it is probably identical with *Pseudorhombus*, and as the prior name it should supersede the latter.

The genera of North American Flounders which seem to be worthy of retention may be thus compared:

- * Pectoral fins well developed. (PLEURONECTIDÆ.)
- † Mouth large, the broad, flat maxillary extending to below the eye; teeth nearly equal on the two sides of the jaws.
 - ‡ Ventral fins both lateral, neither of them on the ridge of the abdomen. (*Hippoglossina*.)
 - a. Body dextral.
 - b. Caudal fin emarginate; teeth strong.
 - c. Lateral line arched in front.....HIPPOGLOSSUS.
 - cc. Lateral line not arched.....PLATYSOMATICHTHYS.
 - bb. Caudal fin entire, its middle rays produced; teeth moderate; lateral line not arched.
 - d. Dorsal beginning over eye; scales moderate, mostly ctenoid.
 - HIPPOGLOSSOIDES.
 - dd. Dorsal beginning in front of eye: scales very small, cycloid.
 - PSETTICHTHYS.
 - aa. Body sinistral; lateral line arched in front.
 - c. Caudal fin entire. (*Pseudorhombus* or)PARALICHTHYS.
 - cc. Caudal fin emarginate.....UROPSETTA.
 - ‡‡ Ventral fin of the colored side on the ridge of the abdomen; body sinistral; teeth small. (*Rhombina*.)
 - f. Lateral line nearly straight; no vomerine teeth: dorsal rays all simpleCITHARICHTHYS.
 - ff. Lateral line arched in front; vomer with teeth; anterior rays of dorsal branched; scales cycloid. .LOPHOPSETTA.
 - †† Mouth small, the short, narrow maxillary scarcely reaching beyond the front of the eye; teeth mostly on the blind side. (*Pleuronectina*.)
 - g. Teeth slender, acute, in several series; body dextral; lateral line nearly straight, with a dorsal branch.

h. Lips plicate; dorsal fin anteriorly twisted over to the blind side.....PLEURONICHTHYS.

hh. Lips simple: dorsal fin anteriorly on the dorsal ridge.
HYSOPOSETTA.

gg. Teeth blunt, usually compressed, in one series, forming a cutting edge.

i. Body dextral.

j. Lateral line with a recurrent dorsal branch.

k. Lateral line nearly straight; scales cycloid, those on the cheeks similarPAROPHIRYS.

kk. Lateral line arched in front; scales ctenoid; those on the cheeks stellate or tuberculate.

LEPIDOPOSETTA.

jj. Lateral line simple.

l. Lateral line arched in front; scales ctenoid..LIMANDA.

ll. Lateral line nearly straight.

m. Dorsal rays less than 80.

n. Scales ctenoid, closely imbricated.

PSEUDOPLEURONECTES.

nn. Scales small, smooth or rough, scarcely imbricated.....PLEURONECTES.

mm. Dorsal rays more than 100; body elongate; scales smooth.....GLYPTOCEPHALUS.

ii. Body sinistral, covered with scattered stellated tubercles; lateral line nearly straight....PLATICHTHYS.

** Pectoral fins wanting (in our species); mouth twisted toward the colored side. (SOLEIDÆ.)

o. Vertical fins free from the rounded caudal; body dextral; ventral of the colored side continuous with the anal. (*Soleinae.*)

p. Scales very rough; lateral line straight; teeth villiform, on blind side only.....ACHIRUS.

oo. Vertical fins confluent around the pointed tail; body sinistral; ventrals free from the anal. (*Plagusinae.*)

q. No lateral line; teeth minute, on blind side only; ventral fin of blind side only present; lips not fringed; snout not hooked; scales ctenoidAPHORISTIA.

15. *Pseudorhombus ocellaris* (DeKay) Lyman.—Flounder.

(*Chauopsetta ocellaris* Gill, l. c.)

Very common.

16. *Pseudorhombus dentatus* (L.) Jor. & Gilb.

Tolerably abundant (Cones and Yarrow).

17. *Pseudorhombus quadrocellatus* (Gill) Jor. & Gilb.

Brownish olive, with four large ocellated spots, round or elliptical in shape; the first above the arch of the lateral line; the three posterior forming an isosceles triangle; the posterior one in the apex on the lateral line; body oval, compressed and much elevated, highest at middle of body; profile with an abrupt angle at anterior margin of orbit; lower

eye beginning in front of the upper; mouth rather small, maxillary reaching to below middle of orbit; teeth comparatively small, about 14 on each side in the lower jaw, the canines of upper jaw little developed; dorsal fin beginning in front of pupil; its anterior rays long, filiform, and with free tips; anal fin beginning well forwards, but little behind the insertion of the ventrals; ventral fin of colored side much the longer; gill-openings comparatively narrow; branchiostegal membranes broadly connected at base; gill-rakers short and strong, few in number, less than 10 below the angle of the arch; head $3\frac{3}{4}$ in length to base of caudal; depth $1\frac{3}{4}$. D. 70. A. 55. Lat. l. about 90.

Two specimens were obtained in Beaufort Harbor, from one of which the above description was taken. This is probably the species noticed by Dr. Yarrow as *Chenopsetta oblonga*. It is a rare and little known species, noticed but once before on our Atlantic coast. Professor Gill's original type came from Pensacola, Fla.

Genus LOPHOPSETTA Gill.

18. *Lophopsetta maculata* (Mitch.) Gill.—*Plaice*.

Common on the sand bars.

GADIDÆ.

Genus PHYCIS Bloch & Schneider.

19. *Phycis regius* (Walb.) Jor. & Gill.

(*Urophycis regius* Gill, l. c.)

One specimen taken by Dr. Cones. Another Gadoid was described to us as being sometimes taken.

OPHIDIIDÆ.

Genus OPHIDIUM Linn.

20. *Ophidium marginatum* DeK.

One specimen observed by Dr. Cones.

ZOARCIDÆ.

Genus ZOARCES Cuvier.

21. *Zoarces anguillaris* (Peck) Storer.

Two specimens taken by Dr. Yarrow from the wharf at Fort Macon.

BLENNIIDÆ.

Genus BLENNIUS Linnaeus.

22. *Blennius geminatus* Wood.

Very abundant, especially about Duncan's wharf in Beaufort. Most of our specimens were taken from clusters of Ascidiæ. The specimen

referred to by Dr. Yarrow as *Blennius fucorum* is probably of this species.

Genus HYPLEUROCHILUS Gill.

23. *Hypleurochilus punctatus* (Wood) Gill.

Abundant with the preceding and the next along the Beaufort shore.

Genus CHASMODES Valenciennes.

24. *Chasmodes bosquianus* (Lac.) C. & V.

Tolerably abundant along the Beaufort shore. Specimens of both the nominal species *C. bosquianus* and *C. novemlineatus* were taken. They differ only in coloration, and we have no doubt that the latter is the male and the former the female of the same species. We have received specimens of both forms, taken in Chesapeake Bay, from Prof. P. R. Uhler. This is the species called *Chasmodes quadrifasciatus* by Uhler and Lugger. The true *quadrifasciatus*, which may not be American, has never been recognized. The coloration in the male (?), or "*C. novemlineatus*," is in life as follows: Olive-green, with about nine horizontal narrow blue lines, these somewhat irregular and interrupted, and converging towards the lateral line; opercular membrane and a broad stripe through the middle of the spinous dorsal deep orange-yellow; anal fin dark, the fins with white membranaceous tips; head with fine black dots.

The female (?), or *C. bosquianus*, is dark olive-green, reticulated with narrow pale green lines and with several broad dark vertical bars, which are more distinct posteriorly; vertical fins similarly marked.

BATRACHIDÆ.

Genus BATRACHUS Linnæus.

25. *Batrachus tau* L.—*Toad-fish*.

Everywhere extremely abundant near the shore.

URANOSCOPIDÆ.

Genus ASTROSCOPUS Brevoort.

26. *Astroscopus anoplus* (C. & V.) Brev.

One specimen taken by Dr. Coues.

TRIGLIDÆ.

Genus DACTYLOPTERUS Lacépède.

27. *Dactylopterus volitans* (L.) Lac.—*Flying-fish*

Rather common. Some ten specimens obtained from fishermen seining in the harbor about Beaufort. The brilliant coloration in life is extremely variable.

Genus PRIONOTUS Lacépède.

28. *Prionotus punctatus* (Bloch) Cuv.—*Slim Flying Toad*.

Two specimens taken.

29. *Prionotus tribulus* C. & V.—*Common Flying Toad*.

Very abundant in Beaufort Harbor. This is doubtless the species mentioned as *Prionotus carolinus* by Dr. Yarrow. Dr. Gill omits this strongly marked species from his Catalogue, apparently confounding it with *P. carolinus* (*palmipes* Storer), which it resembles in color, although its real relations are entirely with *P. evolans*. We have seen no specimens of "*P. carolinus*" from the coast of Carolina, and we do not see how, from the Linnaean description, *P. carolinus* could be distinguished from *P. tribulus*. It becomes, therefore, perhaps an open question whether Linnaeus's *Trigla carolina* was *P. tribulus*, or "*P. carolinus*," or both. Linnaeus's *Trigla evolans* is apparently equally uncertain, so that the present nomenclature of the species must be accepted as provisional only.

30. *Prionotus evolans* (L.) Gill.—*Striped Flying Toad*.

Abundant in the harbor with the preceding species.

The following is an analysis of the characters of the species of *Prionotus* found in the United States. *P. pilatus* Storer is not included, it being probably identical with *P. carolinus*.

* Mouth small: the mandible not reaching the vertical from the front of the orbit: a distinct transverse groove connecting the upper posterior angles of the orbit: preopercular spine simple, without basal cusp: head short, the spines on its upper part comparatively weak: blotches on spinous dorsal well defined, ocellated. (Subgenus *Prionotus*.)

† Body very slender: sides with numerous roundish brown or bronze spots.

P. punctatus (Bloch) C. & V.

Coloration dark olive above: back and sides covered with numerous round spots of different sizes, and not arranged in series: these spots bronze color in life, becoming brownish after death: spinous dorsal dusky, with lighter streaks: a distinct black spot on upper half of spinous dorsal, between the fourth and fifth spine, this spot being ocellated below and behind: a second black blotch on upper half of first spine and membrane, also ocellated behind: second dorsal and caudal spotted and finely blotched with black: anal largely black, with a pinkish border: pectorals blackish: ventrals pale: branchiostegals pinkish: first dorsal rather high: head $3\frac{1}{4}$ times in length to base of caudal: maxillary one-third length of head. D. X—13, A. 11., lat. l. about 75.

‡† Body rather robust: sides with conspicuous round spots.

P. carolinus (L.) C. & V.

Coloration brownish above, clouded with darker: throat and branchiostegal membrane dark: a distinct black blotch on upper half of spinous dorsal, this ocellated below: second dorsal with oblique whitish streaks: preopercular spine strong: pectoral appendages strong, always (?) dilated at their tips: maxillary bone one-third the length of head: head 3 in body. D. X—13, A. 12, lat. l. ca. 55.

** Mouth large, the mandible reaching beyond the vertical from the front of the orbit: no distinct transverse groove between and behind orbits: preopercular spine with a smaller one at base: dark blotches on spinous dorsal diffuse, not occluded. (Subgenus *Chriolax** nobis.)

‡ Sides of body with one or more distinct dark longitudinal bands: spines on head moderate, compressed.

P. evolans (L.) Gill.

Coloration olive-brown above, mottled and spotted with darker and lighter, whitish below: a narrow dark streak along the lateral line, with a broader one below it, which terminates behind in a series of spots and blotches: lower parts of head sometimes bright orange-yellow: pectorals blackish, surrounded by olivaceous and edged with orange, sometimes with numerous transverse dark lines: a black blotch on membrane of dorsal fin between the third and sixth spines: soft dorsal plain or with two black blotches at base: ventrals and anal deep orange: pectoral appendages slender, dark-colored: spine at upper posterior angle of orbit but little developed: body robust: head $2\frac{1}{2}$ in length. D. X—12, A. 11, lat. l. about 55.

‡‡ Sides without longitudinal bands: spines on head all well developed, those above closely compressed.

P. tribulus C. & V.

Dark brown on sides and above, blotched with darker: a black blotch on membrane of dorsal between the third and sixth spines: second dorsal with several series of brownish spots, these forming oblique bars: soft dorsal with two dark blotches at base, the posterior of which is continued obliquely downwards and forwards to below the lateral line: pectorals olive-brown, with dark bands, which are more distinct towards the tip of the fin: pectoral appendages strong, tapering, marked with series of dark spots: body heavy forwards, short and thick: occipital and supraorbital spines strong and "flattened like sword-blades": head $2\frac{1}{2}$ in length to base of caudal. D. X—12, A. 11, lat. l. about 50.

LABRIDÆ.

Genus TAUTOGA Mitchill.

31. *Tautoga onitis* (L.) Gthr.—*Oyster-fish*.

Rather common. The young abundant about the wharves at Beaufort.

Genus PUSA Scopoli (fide Gill).

(*Charojulis* Gill; *Halichares* Rupp.)

32. *Pusa grandisquamis* Gill.

The original type of this species came from Beaufort. Another was secured by Dr. Yarrow.

33. *Pusa* sp. (? *radiata* L.).

A young specimen which we supposed to belong to this species, but which was mislaid or lost before we had a full opportunity for comparison, was taken near Captain Duncan's wharf at Beaufort. Its life-coloration was as follows:

Bright green: a dark brown lateral band covering two rows of scales:

* *χρεια*, want: *ὠλαξ*, furrow.

above this, three bronze bands with green interspaces; below it, a band of crimson; these bands running forwards, and meeting on the snout: dorsal fin bright vermilion, with a large blue spot ocellated with yellow near its middle, a smaller dark-blue spot at base of last dorsal ray, and another at base of caudal: anal red, with a yellowish streak: caudal nearly plain: iris red. Length $1\frac{1}{2}$ inches.

Professor Gill informs me that the name *Pusa* Scopoli was first applied to a species of this most beautiful genus. If this be true, it has many years' priority over *Chærojulis*, *Halichæres*, etc.

XIPHIIDÆ.

Genus XIPHIAS Linn.

34. *Xiphias gladius* L.—*Sword-fish*.

'Heard from' off Cape Lookout by Dr. Yarrow.

TRICHIURIDÆ.

Genus TRICHIURUS Linn.

35. *Trichiurus lepturus* L.

Several seen by Cope and Yarrow; none by us.

SCOMBRIDÆ.

Genus SARDA Cuvier.

36. *Sarda pelamys* (L.) Cuv.

Taken off Shackleford Banks (Yarrow). Not seen by us.

Genus ORCYNUS Cuvier.

37. *Orcynus thynnus* (L.) Goode.—*Bonito*.

(*Orcynus secundodorsalis* Gill, l. c.)

Frequently heard of, but not seen by us.

Genus CYBIUM Cuvier.

38. *Cybium maculatum* (Mitch.) Cuv.—*Spanish Mackerel*.

A highly valued food-fish, taken in great numbers in the fall, on the banks. No extensive fishing is done in August, and we did not see this species at Beaufort. A large one leaped on board our steamer in Albemarle Sound on our return northward.

39. *Cybium regale* (Bloch) Cuv.

One specimen seen by Dr. Yarrow.

CARANGIDÆ.

Genus VOMER Cuvier.

- 40.
- Vomer setipinnis*
- (Mitch.) Ayres.—
- Moon-fish*
- ;
- Sunfish*
- .

Taken on the outer beach in the fall; not seen by us.

Genus SELENE Lacépède.

- 41.
- Selene argentea*
- Lac.—
- Moon-fish*
- .

Taken on the outer beach in the fall; not common; one specimen obtained by us.

Genus ARGYRIOSUS.

- 42.
- Argyriosus vomer*
- Lac.—
- Moon-fish*
- .

Less common (Yarrow). Not seen by us. There seems to be no good evidence that *Argyriosus capillaris* is a species distinct from this.

Genus ALECTRIS Rafinesque.

(*Blepharis*, etc., Cuvier; *Blepharichthys*, etc., Gill.)

- 43.
- Alectris crinitus*
- (Akerly) Jor.

A few individuals taken by Dr. Yarrow; none seen by us at Beaufort. Most of the Scombroid fishes about Beaufort are taken by the fishermen on the outer banks in the fall, and hence escaped our notice.

The genus *Blepharichthys* Gill seems unnecessary, as the prior use of *Blepharis* in Botany does not, in accordance with the general custom of naturalists, prevent its use in Zoölogy. The distinctions between *Blepharis* and *Alectris*, being merely in the degree of obsolescence of the spinous dorsal, do not seem to us important.

Genus CARANGUS Girard.

- 44.
- Carangus chrysus*
- (Mitch.) Gill.—
- Sunfish*
- .

Rather common in Beaufort Harbor. Several young specimens taken among the wharves.

- 45.
- Carangus hippus*
- (L.) Gill.

In Dr. Yarrow's list; not seen by us.

- 46.
- Carangus pisquetos*
- (C. & V.) Gill.

(*Paratractus pisquetos* Gill, l. c.)

One specimen seen by Coues and Yarrow.

Genus TRACHYNOTUS Lacépède.

- 47.
- Trachynotus ovatus*
- (L.) Gilr.—
- Allovericore*
- (
- Albicore?*
-).

One young specimen taken at Beaufort.

48. *Trachynotus carolinus* (L.) Gill.—*Pampano*; *Sunfish*.

Very abundant on the outer banks. The young go in great schools in the surf, and may be readily taken in a net, and sometimes by hand when thrown on shore by the waves.

Genus SERIOLA Cuvier.

(*Halatractus* and *Zonichthys* Gill.)

49. *Seriola zonata* (Mitch.) Cuv.

One specimen observed by Dr. Yarrow; not seen by us. *Naucrates ductor*, included in Dr. Yarrow's list on the strength of information derived from fishermen, we here omit: the species is too easily confounded with the present.

STROMATEIDÆ.

Genus PORONOTUS Gill.

50. *Poronotus triacanthus* (Peck) Gill.

Rare; seen by Coues and Yarrow—not by us.

SCIÆNIDÆ.

Genus CYNOSCION Gill.

51. *Cynoscion carolinensis* (C. & V.) Gill.—*Speckled Trout*.

An abundant food-fish.

52. *Cynoscion regalis* (Bloch) Gill.—*Sea Trout*.

A common food-fish, although less abundant than the preceding.

Genus POGONIAS Lacépède.

53. *Pogonias chromis* Lacép.—*Sea Drum*.

Very common.

Genus LIOSTOMUS.

54. *Liostomus xanthurus* Lacép.

Abundant in the fall (Yarrow); not seen by us.

55. *Liostomus obliquus* (Mitch.) DeKay.—*Spot*.

Next to the Mullet, this is the most abundant food-fish about Beaufort, the young swarming everywhere in the harbor. It is universally known as *Spot*, the Robin or Pin-fish being *Lagodon*, and the Hog-fish *Orthopristis*. These vernacular names have been transposed by Dr. Yarrow.

Genus BAIRDIELLA Gill.

56. *Bairdiella punctata* (L.) Gill.—*Perch*.

Rather common among the wharves.

Genus SCIÆNOPS Gill.

57. *Sciænops ocellatus* (L.) Gill.—*Drum*.

A rather common food-fish; numerous specimens obtained from the fishermen. One specimen obtained had *two* ocellated spots on the caudal peduncle.

Genus MENTICIRRUS Gill.

58. *Menticirrus littoralis* (Holbr.) Gill.—*Sea Mullet*.

Rather common. The young abundant in the surf on the outer beach, with *Trachynotus carolinus*.

59. *Menticirrus alburnus* (L.) Gill.

Not seen by us.

60. *Menticirrus nebulosus* (Mitch.) Gill.

Not seen. Dr. Yarrow says that this species and the two preceding are "all more or less abundant in the fall, when they are found in company with the Mullet on the sea-beach."

Genus MICROPOGON Cuvier.

61. *Micropogon undulatus* (L.) C. & V.—*Croaker*.

Very abundant; next to Mullet, Spot, and Hog-fish, the commonest food-fish in Beaufort Harbor.

GERRIDÆ.

Genus EUCINOSTOMUS Baird & Girard.

62. *Eucinostomus argenteus* B. & G.

Common in the harbor, along the Beaufort shore. Only very young specimens seen.

PIMELEPTERIDÆ.

Genus PIMELEPTERUS Lacépède.

63. *Pimelepterus bosci* Lac.

A single specimen taken near Duncan's wharf in Beaufort.

SPARIDÆ.

Genus LAGODON Holbrook.

64. *LAGODON rhomboides* (L.) Holbr.—*Robin; Pin-fish*.

Excessively abundant everywhere in the harbor. Taken by the thousand by boys with hook and line, from the wharves. This species does not attain a large size, and is seldom used as food in Beaufort, where larger fishes are so plenty. Its value there is about one-tenth of a cent, and it is thrown away by the fishermen. As elsewhere noticed, the "Spot," "Robin," and "Hog-fish" of the fishermen have been in some way misunderstood or confused by Dr. Yarrow.

Genus ARCHOSARGUS Gill.

65. *Archosargus probatocephalus* (Walb.) Gill.—*Sheepshead*.

Abundant; we saw but few specimens, however, the proper Sheeps-head season being passed.

Genus SARGUS Cuvier.

66. *Sargus holbrooki* Bean.—*Spot-tailed Pin-fish*.

Extremely abundant everywhere along the Beaufort shore. This species was first described by Dr. Bean during the past year. That so strongly marked and so abundant a species should have so long escaped notice is very remarkable. Dr. Yarrow does not seem to have noticed it and Dr. Cones obtained but one specimen, the generic characters of which seem to have escaped Professor Putnam's notice, as he speaks of it as "an individual resembling *S. argyrops*," but differing in color. This species has broad incisors and wants the recumbent dorsal spine. Its color is bright silvery, with a large black blotch on the upper part of the caudal peduncle, which is very conspicuous while the fish is in the water. It reaches but a small size, and is not at Beaufort used as food. The fishermen call it Pin-fish, and as such it is beneath their notice. Most of the fishermen, indeed, did not distinguish it from *Latgodon rhomboides*.

Genus STENOTOMUS Gill.

67. *Stenotomus argyrops* (L.) Gill.

Not very common; hardly noticed by the fishermen.

PRISTIPOMATIDÆ.

Genus HÆMULUM Cuvier.

68. ? *Hæmulum arcuatum* C. & V.

Not seen by us; given in Dr. Yarrow's list, but evidently confused with the next species, so that its occurrence at Beaufort is questionable. The proper orthography of the generic name (*αἷμα*, blood; *ὄλον*, gums) is *Hemulum*, not *Hemylum*, nor *Hemulon*.

Genus ORTHOPRISTIS Girard.

69. *Orthopristis fulvomaculatus* (Mitch.) Gill.—*Hog-fish*.

Extremely common everywhere in the harbor.

SERRANIDÆ.

Genus EPINEPHELUS Bloch.

70. *Epinephelus morio* (Cuv.) Gill.

One specimen noted by Dr. Yarrow.

Genus CENTROPRISTIS Cuvier.

- 71.
- Centropristis atrarius*
- (L.) Barn.—
- Black-fish*
- .

Common, the young abounding about the wharves.

PERCIDÆ.

Genus ROCCUS Mitchill.

- 72.
- Roccus lineatus*
- (Mitch.) Gill.—
- Rock*
- .

Not seen in Beaufort Harbor, but abundant in all river-mouths, as in New and Neuse Rivers. Dr. Yarrow states that the "young are abundant" in the harbor. As the striped female of *Hydrargyra majalis* is called by all Beaufort fishermen "Rock," and as it is there usually supposed to be the young of the Striped Bass, Dr. Yarrow's statement may perhaps be an error.

Genus MORONE Mitchill.

- 73.
- Morone americana*
- (Gmel.) Gill.—
- White Perch*
- .

Not found about Beaufort, but said by Dr. Yarrow to abound in the New and Neuse Rivers.

EPHIPPIDÆ.

Genus PAREPHIPPUS Gill.

- 74.
- Parephippus faber*
- (Cuv.) Gill.—
- Porgee; Pogy*
- .

Common; used as a food-fish.

POMATOMIDÆ.

Genus POMATOMUS Lac.

- 75.
- Pomatomus saltatrix*
- (L.) Gill.—
- Blue-fish*
- .

Extremely common. The taking of this fish is the favorite amusement of the higher grades of summer boarders in this delightful port.

ECHENEIDIDÆ.

Genus ECHENEIS Linnæus.

(*Leptecheneis* Gill.)

In 1862 (Proc. Acad. Nat. Sci. Phila. 239), Prof. Gill divided the Linnæan genus *Echeneis* into two genera, *Echeneis* (the slender species: type *E. naucrates* L.) and *Remora* (the stout-bodied species: type *E. remora*). Subsequently (op. cit. 1863, 88), *Remoropsis* (which has not been sufficiently distinguished from *Remora*) and *Rhombochirus* were added. Still later (op. cit. 1864, 60), Prof. Gill found, "on examining the works of Linnæus and Artedi, that *E. remora* was the only species referred to that genus by Linnæus in the early editions of the Systema

Naturæ, and by Artedi, and that in the later editions, Linnæus placed that species at the head of the genus." For that reason, the name *Echeneis* was retained for *E. remora*, and a new name, *Leptecheneis*, conferred on *E. naucrates* and its allies.

As, however, according to the custom now prevalent in Ichthyology, we are not to go behind the tenth edition of the *Systema Naturæ*, and as the placing of a species "at the head of the genus" had no significance with Linnæus, we think that Dr. Gill's first restriction of *Echeneis* should have precedence over the second.

The genera of *Echeneididæ* thus far known are, then, the following:

1. REMORA Gill: type *Echeneis remora* L.; *Echeneis jacobœa* Lowe.
2. REMILEGIA Gill: type *Echeneis australis* Bennett.
3. RHOMBOCHIRUS Gill: type *Echeneis ostiochir* Cuvier.
4. ECHENEIS Linn.: type *Echeneis naucrates* L.
5. PITHEIRICHTHYS Gill: type *Echeneis lineatus* Menzies.

76. *Echeneis naucrates* L.

Two specimens seen by Coles and Yarrow.

Genus REMORA Gill.

77. *Remora jacobœa* (Lowe) Gill.

(*Echeneis remora* L.)

Specimens seen by Dr. Yarrow, taken off Shackleford Banks.

SPHYRÆNIDÆ.

Genus SPHYRÆNA Bloch.

78. *Sphyræna spet* (Haiti) Goode.

Young specimens common in Beaufort Harbor. Our species is usually called *Sphyræna borealis* DeKay, without comparison with allied forms. What fish DeKay had in mind is not clearly known. We identify our Beaufort specimens with *Sphyræna spet* (*Esox sphyræna* L., *Sphyræna vulgaris* Auct.), the common species of Europe and the Middle Atlantic. Whether the West Indian *S. picuda* also occurs northward, to help form the dubious *Sphyræna borealis*, is still uncertain.

MUGILIDÆ.

Genus MUGIL Linnæus.

79. *Mugil brasiliensis* Agassiz.—*White Mullet*.

Very common in the harbor.

80. *Mugil plumieri* Bloch.—*Striped Mullet*.

The commonest food-fish of the North Carolina coast; everywhere very abundant on the shoals in the harbor.

Two species of *Mugil* certainly occur on our Atlantic coast, but they have been confounded or misunderstood by nearly all writers except

Dr. Günther, who correctly describes them under the names *Mugil lineatus* and *Mugil brasiliensis*. The nomenclature of both is uncertain. The oldest specific name, *Mugil albula* L., is apparently not available, as its description applies equally to either, and is in some respects incorrect. It is, however, perhaps as applicable to *M. brasiliensis* as that of *Trigla erolans* is to our striped *Prionotus*. The following is Linnaeus's description:

"Mugil Albula. M. pinna dorsali anteriore quadriradiata. D. 4, 9. P. 17. V. $\frac{1}{2}$. A. $\frac{2}{1}$. C. 20, xxx. Habitat in America. D. Garden. Simillimus *M. cephalo*."—(Syst. Nat. xii, i, 520, 1766).

The diagnostic characters and the apparent synonymy of the two species are the following:

Mugil brasiliensis Agassiz.

White Mullet.

? Catesby, ii, pl. 5.

? *Curema* Macgr. 181, Pison 70.

? *Mugil albula* Linn. Syst. Nat. ed. xii, i, 520, 1766.

Mugil brasiliensis Agassiz, Spix, Pisc. Bras. 234, tab. 72 (*vide* Günther).—Günther, Cat. Fishes Brit. Mus. iii, 431.

? *Mugil incilis*, Hancock, Lond. Quart. Journ. Sc. 1830, 127 (*vide* Günther).

Mugil curema Cuv. et Val. xi, 87, and of authors.

Mugil petrosus Cuv. et Val. xi, 89, and of authors.

Mugil lineatus Storer, Hist. Fishes Mass. 89, pl. 16, f. 4 (good).

Body somewhat compressed: angle made by the dentary bones about a right angle: space at the chin between the dentary bones somewhat club-shaped: scales larger, running up on the soft dorsal and anal fins: coloration bluish above, the sides silvery without conspicuous dark stripes, but with shining streaks, produced by the striation of the scales: a dusky blotch at base of pectorals: tips of caudal and soft dorsal blackish. Anal rays III, 9. Scales 38—12. Size less than the next.

Mugil plumieri Bloch.

Striped Mullet.

Mugil plumieri Bloch, t. 296, and of authors.

Mugil lineatus Mitchell, Cuv. et Val. xi, 96, and of nearly all authors.

Mugil albula DeKay, New York Fauna, Fishes. 146.

Mugil berlandieri Girard, U. S. Mex. Bound. Ichth. p. 20, pl. x, fig. 1 (not fig. 4, which represents the young of *M. brasiliensis*).

Body little compressed: angle of mandible obtuse: space between dentary bones broad and short, rounded anteriorly: scales smaller, not running up on the dorsal and anal fins. Coloration dark bluish above; sides silvery, with series of darker spots, one on each scale, forming conspicuous lateral stripes: a dusky spot at base of pectorals. Anal rays III, 8. Scales 42—13. The common "Mullet," so extensively split and salted as a food-fish.

The two species seem to occur on the same shores, and both range from Massachusetts to South Carolina at least.

ATHERINIDÆ.

Genus CHIROSTOMA Swainson.

81. *Chirostoma menidium* (Linn.) Gill.—*Sardines*.

We fail to find any evidence that *Chirostoma notatum* (Mitch.) Gill and *C. menidium* are distinct species. Very abundant in the harbor, where it is found generally in company with *Engraulis vittata*, both being known by the fishermen indiscriminately as Sardines.

Genus ATHERINA Linnaeus.

82. *Atherina carolina* Val.

A few specimens noted by Drs. Coues and Yarrow.

BELONIDÆ.

Genus BELONE Cuvier.

83. *Belone longirostris* (Mitch.) Gill.

Very abundant in Beaufort Harbor.

84. *Belone hians* C. & V.

One specimen obtained. This is a West Indian species, not recorded from our coast until this summer, when Prof. Goode received a number of specimens from the coast of North Carolina. It is probably a resident on our coast, as the specimen taken was quite young.

SCOMBERESOCIDÆ.

Genus EXOCÆTUS Linnaeus.

85. *Exocætus melanurus* Val.—*Flying-fish*.

"Occasionally seen" (Dr. Yarrow).

Genus HALOCYPSELUS Weinland.

86. *Halocypselus evolans* (Linn.) Gill.

One young specimen taken in Beaufort Harbor.

Genus HEMIRHAMPHUS Cuvier.

87. *Hemirhamphus unifasciatus* Ranzani.

Very abundant in the harbor, along the edges of shoals.

Genus SCOMBERESOX Lacépède.

88. *Scomberesox scutellatus* Le Sueur.

Recorded by Dr. Yarrow.

CYPRINODONTIDÆ.

Genus CYPRINODON Lacépède.

- 89.
- Cyprinodon variegatus*
- Lac.—“
- Sheep's Head*
- .”

One specimen seen by us.

Genus FUNDULUS Lacépède.

- 90.
- Fundulus heteroclitus*
- (Linn.) Gill.

Very common. The species called *F. pisculentus* (Mitch.) Val. and *F. heteroclitus* are unquestionably identical.

Genus HYDRARGYRA Lacépède.

- 91.
- Hydrargyra majalis*
- (Walb.) Val.—
- Rock Fish*
- (♀).

Very abundant.

- 92.
- Hydrargyra swampina*
- Lac.

Reported as exceedingly abundant by Drs. Coues and Yarrow.

SYNODONTIDÆ.

Genus SYNODUS Bloch.

- 93.
- Synodus foetens*
- (Linn.) Gill.—
- Pike*
- .

Abundant in the harbor.

ALBULIDÆ.

Genus ALBULA Gronovius.

- 94.
- Albula vulpes*
- (Linn.) Goode.—
- Lady Fish*
- .

(Albula conorhynchus Gill, op. cit.)

Reported by Dr. Yarrow on the authority of a fisherman.

ELOPIDÆ.

Genus ELOPS Linnaeus.

- 95.
- Elops saurus*
- Linn.—“
- Horse Mackerel*
- .”

One very large specimen seen.

Genus MEGALOPS Lacépède.

- 96.
- Megalops thrissoides*
- (Bl. & Schn.) Günther.

Reported by Dr. Yarrow as very rare, on the authority of fishermen.

CLUPEIDÆ.

Genus BREVOORTIA Gill.

- 97.
- Brevoortia tyrannus*
- (Latrobe) Goode.—
- Fat Back*
- ;
- Yellow Tail*
- ;
- Bug Fish*
- .

Very abundant.

Genus *ALOSA* Cuvier.

98. *Alosa sapidissima* (Wilson) Storer.

Probably not found in Beaufort Harbor. Reported by Drs. Coues and Yarrow as excessively abundant in the Neuse River.

Genus *OPISTHONEMA* Gill.

99. *Opisthonema thrissa* Gill.

Several specimens obtained.

Genus *POMOLOBUS* Rafinesque.

100. *Pomolobus pseudoharengus* (Wilson) Gill.

Recorded by Dr. Yarrow as not abundant.

101. *Pomolobus mediocris* (Mitch.) Gill.

Recorded by Dr. Yarrow as abundant.

ENGRAULIDIDÆ.

Genus *ENGRAULIS* Cuvier.

102. *Engraulis vittatus* (Mitch.) Bd. & Girard.—*Sardine*.

Extremely common, occurring in large schools. There is no good evidence that the West Indian *E. browni* (Gmel.) Val. occurs on our coast, or that we have more than one Atlantic species.

SILURIDÆ.

Genus *ÆLURICHTHYS* Baird & Girard.

103. *Ælurichthys marinus* (Mitch.) Bd. & Grd.

Several specimens obtained.

Genus *ARIOPSIS* Gill.

104. *Ariopsis felis* (Linn.) Gill & Jordan.

(*Ariopsis milberti* Gill, op. cit.)

Several specimens seen.

ANGUILLIDÆ.

Genus *ANGUILLA* Thunberg.

105. *Anguilla vulgaris* Turton.—*Eel*.

(*Anguilla bostoniensis* Gill, op. cit.)

Common.

ACIPENSERIDÆ.

Genus ACIPENSER Linnæus.

- 106.
- Acipenser sturio*
- Linn.—
- Sturgeon*
- .

A large skin found in the harbor near Cape Lookout.

CEPHALOPTERIDÆ.

Genus CERATOPTERA Müller & Henle.

- 107.
- Ceratoptera vampirus*
- (Mitch.) Gill.—
- Devil-fish*
- .

Fishermen state that they are occasionally found in the harbor.

MYLIOBATIDÆ.

Genus AËTOBATIS Müller & Henle.

- 108.
- Aëtobatis narinari*
- Müll. & Henle.

One large specimen seen.

Genus MYLIOBATIS Duméril.

- 109.
- Myliobatis fremenvillei*
- (Les.) Storer.

Tail of one specimen observed.

DASYBATIDÆ.

(Trygonidæ Gill, op. cit.)

Genus DASYBATIS Rafinesque (fide Gill).

(Trygon Gill, op. cit.)

- 110.
- Dasybatis centrurus*
- (Mitch.) Gill, MSS.—
- Sting Ray*
- ;
- Stingaree*
- .

Very common.

Genus PTEROPLATEA Müller & Henle.

111. ?
- Pteroplatea maclura*
- (Le Sueur) M. & H.—
- Skate*
- .

Several specimens about one foot long, the young of some broad species. They do not answer Le Sueur's account of the present species, and there is no trace of a caudal spine, which on a Sting Ray of the same size is fully developed. If not the young of *Pteroplatea*, they will constitute a new genus.

The following are the characters shown by our specimens:

Disk very broad and short, its width nearly twice its length without the tail; tail short, slender and small, its length about one-third that of the disk; a dermal fold above and below; whole disk and tail covered with smooth skin, without spine or roughness of any kind; snout pro-

jecting and pointed; the pectorals broadly expanded on each side, leaving a marked concavity in the outline of the body along their anterior margins on each side, in front of which is a convexity which terminates in the mucronate snout.

Mouth small; teeth triangular, rather pointed; nostrils well apart, confluent with the mouth; a broad flap behind and between them, which seems to form an upper lip.

Color brownish olive, beautifully marbled with grayish, and marked with roundish stellate spots and finer markings of dark brown; edge of disk with rounded pale spots, forming semicircles on the border; tail with four dark blotches above, forming half-rings.

TORPEDINIDÆ.

Genus TORPEDO Duméril.

112. *Torpedo occidentalis* Storer.

Recorded as rare, by Dr. Yarrow, on the authority of fishermen.

RAIIDÆ.

Genus RAIJA Linnæus.

113. *Raia lævis* Mitch.

Recorded by Dr. Yarrow as common.

CARCHARIIDÆ.

Genus CARCHARIAS Rafinesque.

(*Odontaspis* Agassiz; *Eugomphodus* Gill.)

114. *Carcharias americanus* (Mitch.) Jor. & Gilb.

(*Eugomphodus littoralis* Gill, op. cit.)

One pair of jaws seen. The name *Carcharias* has priority over *Odontaspis*, as Dr. Gill has shown, and our species seems hardly generically distinct from the European.

SPHYRNIDÆ.

Genus SPHYRNA Rafinesque.

115. *Sphyrna zygaena* (Linn.) Müll. & Henle.

A single specimen recorded by Dr. Yarrow.

Genus RENICEPS Gill.

116. *Reniceps tiburo* (Linn.) Gill.—*Shovel-headed Shark*; *Bonnet-head*.

Abundant.

GALEORHINIDÆ.

Genus SCOLIODON Müller & Henle.

117. *Scoliodon terræ-novæ* (Rich.) Gill.—*Sharp-nosed Shark*.

Very abundant in the harbor.

AMPHIOXIDÆ.

Genus AMPHIOXUS Yarrell.

118. *Amphioxus caribæus* (Sundevall) Jor. & Gilb.

Abundant in the harbor, on Bird Shoal; not, however, obtained by us.

DECEMBER, 1878.

A PARTIAL LIST OF THE BIRDS OF CENTRAL CALIFORNIA.

By L. BELDING, of Stockton.

Edited by R. RIDGWAY.

The present paper is based upon observations extending through about twenty years' residence in California, and collections made chiefly during the last two years, which have, from time to time, been forwarded by Mr. Belding to the National Museum.* The list is believed to be a tolerably complete one, Mr. Belding's long residence in the State and his active interest in ornithology having enabled him to become quite familiar with the bird-fauna of most parts of the interior of California. Still, observations made at a few outlying points, or extended for a longer period at localities already investigated, would, no doubt, add considerably to the number of the species. The editor's remarks are either enclosed in brackets or followed by his initials ("R. R."). He is responsible for the nomenclature adopted, and the determination of the species—although, as to the latter, Mr. Belding had correctly identified them all, with a very few exceptions among the difficult forms, whose correct determination is hardly possible in the field.

The asterisk before the number indicates that the species has been found breeding in Central California; and only those actually ascertained to do so are thus marked. In the list of specimens, the asterisk before the locality shows that the species breeds at that particular place. The number in these lists is that of the National Museum Register, in which the specimens sent by Mr. Belding are entered. Notes upon a few of the species collected by Mr. Belding have been published by the writer in the Bulletin of the Nuttall Ornithological Club for April, 1878, pp. 64-68, to which those interested are referred.—R. R.

*The collections thus far received from Mr. Belding amount to about 180 species (not including races) and 600 specimens. Notes were sent on 38 additional species, making a total of 217 treated in this paper.—R. R.