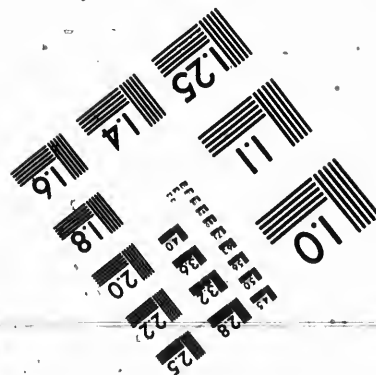
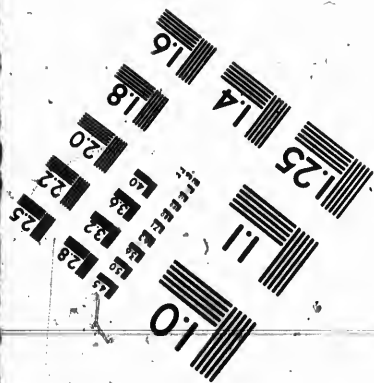
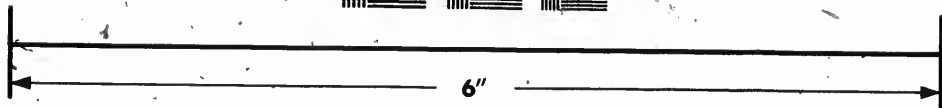
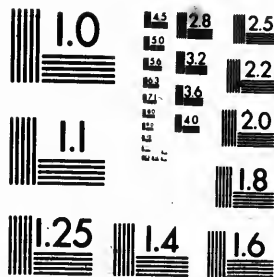


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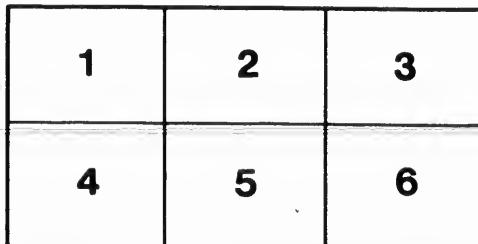
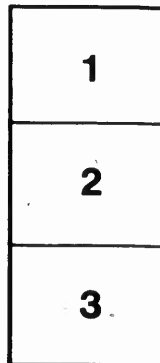
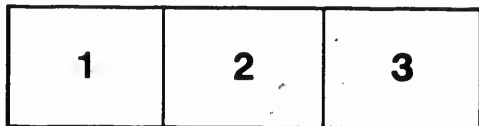
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SYNOPSIS OF

# THE FISHES

OF THE GULF OF ST. LAWRENCE AND BAY OF FUNDY.

SYNOPSIS OF THE FISHES OF THE GULF OF ST.  
LAWRENCE AND BAY OF FUNDY.

By PROF. THEODORE GILL, M.A.

*From Canadian Naturalist for August, 1865.*

The interest that has for some time been manifested in the fishes and fisheries of the Gulf of St. Lawrence and Bay of Fundy, and the absence of facilities for the ready identification of some of the species, appear to render desirable the publication, in a brief and connected form, of the views respecting the nomenclature and affinities of the species, resulting from our present knowledge of the class. This is the more desirable, as some of the observations hitherto made—on account of the difficulty experienced in identifying the species—have not that full value to which the conscientious care with which they have been made should entitle them. The present enumeration is based on the observations of Messrs Richardson, H. R. Storer, Dawson, Jones, Perley, Fortin, and Bell, verified in most cases by an examination of specimens either from the district referred to, or from closely contiguous portions of the same faunal region.

In the enumeration of the species, I have essentially followed the order adopted in the 'Catalogue of the Fishes of the Eastern Coast of North America,' modified however in some important respects by subsequent studies. Still further departures should be made,—but I defer such changes till the publication of a more extensive work on which, I am now engaged. The analytical tables, artificial as such are, will, it is hoped, prove useful in assisting in the progressive identification of unknown forms, as well as in conveying information concerning the technical or natural characters of the groups, and in many cases their relations to each other. How difficult the compilation of such tables is can be readily appreciated by experienced ichthyologists who will examine any of those hitherto published. I may not therefore possibly hope that the present attempt should be exempt from many defects: only the more obvious superficial characters of

families peculiar to the types here noticed, but not to all belonging to them, have in several cases been employed. In conclusion, it need only be stated that the nomenclature here adopted is in every case in most strict conformity with the rules proposed by the British Association, founded on the teachings of the great Swedish reformer, and subsequently endorsed by the American Association.\* We may regret that rules so truly founded on good sense should have been so frequently infringed in previous enumerations of our fishes, and that the consequent innovations should have been admitted unchallenged by so many responsible naturalists. Many of these corrections, so long deferred, have only been very recently made, and such are adopted in the following enumeration. It is to be hoped, as it is believed, that the time has passed when obvious infractions of wholesome rules of nomenclature should not only be committed with impunity, but even sustained by others.

Those species which have not been found in the gulf or bay, but in closely contiguous waters, or at places beyond both extremities of the area indicated, are pointed out by an asterisk (\*) placed before the name: when the name or specific rank is doubtful, an asterisk is generally placed after it:

#### SUB-CLASSES OF FISHES.

##### I. Branchiæ free at their distal margins.

A. Optic nerves decussating. Arterial bulb normally with two opposite valves at its origin. (Skeleton more or less completely ossified.) TELEOSTEI.

B. Optic nerves not decussating. Arterial bulb with several rows of valves. (Skeleton variable.) GANOIDEI.

##### II. Branchiæ attached. (Skeleton always cartilaginous.)

A. Optic nerves not decussating. Arterial bulb with several rows of valves. Ventral fins always present, abdominal, provided in the males with peculiar sexual appendages. *Copula gaudens.* ELASMOBRANCHIA.

B. Optic nerves decussating. Heart without muscular tunic, but with two opposite valves. Ventral fins entirely absent. (Body serpentiform, without pectorals or ventrals.)

#### MARSIPOBRANCHIA.

\* In order not to be misunderstood, I may state that, like most others, I have not hitherto followed § 2 of the British rules limiting priority to the twelfth edition of the *Systema Naturæ*; but at the same time I believe that if the tenth edition were substituted for the twelfth, adherence to that rule might not be unadvisable. No cause for the infraction of the rule occurs in the present article.

TELEOSTEI.

ORDERS AND SUB-ORDERS.

I. Branchial laminae pectinated.

1. Maxillaries normally developed and normally distinct from each other.

A. Pubic bones generally connected with scapular arch. Ventral fin anterior (thoracic to jugular).

B. Sides symmetrical.

C. Dorsal rays anteriorly inarticulated, spinous; first ventral ray also spinous.

a. Branchial apertures in advance of the pectoral fins.

β. Branchial apertures behind or in the axils of the pectoral fins.

CC. Dorsal rays articulated as well as the first ventral ones.

BB. Sides dissimilar, both eyes being situated on one side, which is darker than the eyeless one. HETEROSOMATA.

AA. Pubic bones free; ventral fins abdominal.

B<sup>1</sup>. Pharyngeal bones more or less plane.

B<sup>2</sup>. Pharyngeal bones falciform.

2. Maxillaries generally obsolete or rudimentary. *Scapular arch not connected with skull.* Body serpentineform. APODES.

3. Supramaxillary bones rudimentary, enveloped in more or less extended barbels.

4. Elements of lower jaw united and forming a single piece.

II. Branchiae tufted. (Body enclosed in a case formed by regular plates.)

FAMILIES OF ACANTHOPTERYGII.

A. Breast with no suctorial disk.

B. Cheeks not defended, no suborbital bone forming a stay. Posterior dorsal rays branched.

The area in front of pectoral fins much abbreviated, very much higher than wide.

1. Jaws normal, more or less protractile.

a. Spinous dorsal normally longer than soft portion.

TELEOCEPHALI.

ACANTHOPTERYGII.

PEDICULATI.

JUGULARES.

HETEROSOMATA.

ABDOMINALES.

EVERTOGNATHI.

NEMATOGNATHI.

PLECTOGNATHI.

SCLERODERMI.

LOPHOBANCHII.

\* Spinous dorsal not depressible in a furrow. Lower pharyngeal bones separated.

\*\* Spinous dorsal depressible in a furrow. Lower pharyngeal bones separated. (*Lepominae*.) CENTRARCHIDE.



A. Breast with no suctorial disk.

B. Cheeks not defended, no suborbital bone forming a stay. Posterior dorsal rays branched.

The area in front of pectoral fins much abbreviated, very much higher than wide.

1. Jaws normal, more or less protractile.

a. Spinous dorsal normally longer than soft portion.

\* Spinous dorsal not depressible in a furrow. Lower pharyngeal bones separated.

\*\* Spinous dorsal depressible in a furrow. Lower pharyngeal bones separated. (*Lepominae*) CENTRARCHIDÆ.

\*\*\* Spinous dorsal depressible in a furrow. Lower pharyngeal bones united. LABRIDÆ.

6. Spinous dorsal shorter than second.

\* Skull with cavernous or excavated bones. Caudal with the lateral line continued between its median rays.

\*\* Skull smooth, not excavated.

2. Jaws normal, not protractile, the upper being covered by the skin at symphysis. Body elongated more or less fusiform. Last soft dorsal rays generally detached, and developed as spurious finlets.

3. Jaws pointed, the upper united and prolonged into an ensiform weapon.

B<sup>2</sup>. Cheeks partly protected. Area in front of pectoral fins well developed, oblong! Ventral fins considerably behind pectorals, with large spines.

B<sup>3</sup>. Cheeks defended by one of the suborbital bones, which extends to the inner ridge of the preoperculum.

D<sup>1</sup>. First dorsal longer than the second.

D<sup>2</sup>. First dorsal shorter than the second.

a. Ventral fins approximated, generally imperfect.

1. Body not mailed.

2. Body completely encased by plates.

β. Ventral fins distant, separated by a wide flattened area.

B<sup>1</sup>. Cheeks unarmed, the suborbital osselets being little developed. Dorsal entirely composed of spines.

a. Pyloric coeca obsolete.

1. Teeth enlarged, adapted for crushing.

2. Teeth small and acute.

β. Pyloric coeca developed.

1. Ventral fins developed. Head conic in front, compressed.

2. Ventral fins obsolete. Head oblong, pitted above, cleft subvertical.

A.A. Breast with suctorial disk formed by the perfect union of the ventral fins.

PERCIDÆ.

CENTRARCHIDÆ.

LABRIDÆ.

SCLENIIDÆ.

POMATOMIDÆ.

SCOMBRIDÆ.

XIPHIIDÆ.

GASTEROSTEIDÆ.

SCORPAENIDÆ.

COTTIDÆ.

AGONIDÆ.

TRIGLIDÆ.

ANARRHCADIDÆ.

XIPHIODONTIDÆ.

STICHAIDÆ.

CRYPTACANTHIDÆ.

CYCLOPTERIDÆ.

## TELEOSTEI.

## Order TELEOCEPHALI.

## Sub-order ACANTHOPTERYGII.

## PERCIDÆ GILL.

## PERCINÆ (Bon.) Gill.

Anal fin with two spines. Vertebrae in increased numbers  
( $10 + x$  |  $14 + y$ ).

Genus *Perca* Linn.

Teeth villiform. Dorsal fins distinct. D. xiii - xv. i - ii.  
13 - 14. A. ii. 6 - 9.

*Perca flavescens* Mitch. Yellow perch; Perch. (Perley.)

*Perca flavescens*, Storer, Mem. Am. Ac. v, 52, pl. ii, fig. 1.

## LABRACINÆ Gill.

Anal fin with three spines. Vertebrae generally in normal number  
( $10 - 11$  |  $14 - 15$ ).

The genera *Roccus* and *Morone* differ even more decidedly in anatomical than external characters.

Genus *Roccus* Gill ex Mitch.

Tongue with teeth at middle. Dorsal fins almost distinct.  
D. ix. i. 12 - 14. A. iii. 10 - 13.

*Roccus lineatus* Gill. Striped bass. (Perley.)

*Labrax lineatus*, (C.), Storer, Mem. Am. Ac. v, 54, pl. i, fig. 4.

Genus *Morone* Gill ex Mitch.

Tongue with no teeth in middle. Dorsal fins connected at base.  
D. ix. i. 12 - 14. A. iii. 7 - 11.

*Morone Americana* Gill. White perch. (Perley.)

*Labrax rufus*, Storer, Mem. Am. Ac. v, 57, pl. i, fig. 1.

## CENTRARCHIDÆ GILL.

## LEPOMINÆ Gill.

Soft parts of dorsal and anal fins equal and opposite to each other.

Genus *Pomotis* (Raf.) Gill.

D. x 10-12. A. iii. 10-12. Pharyngeal bones closely contiguous,  
with paved teeth.

*Pomotis aureus* Gill ex Walb. Sun-fish. (Perley.)

*Pomotis vulgaris*, Storer, Mem. Am. Ac. v, 60, pl. iii, fig. 1.

## LABRIDÆ (Cuv.) BLER.

## LABRINÆ (Bon.) Gthr.

D. xiii - xiii + x. Teeth conical. Lateral line continuous, not abruptly decurved behind.

Genus *Tautoga* (Mitch.) Gthr.

Opercles naked. Teeth in two rows. D. xvii. - 10. A. iii. 7 - 8.

*Tautoga onitis* Gthr. ex Linn. Black-fish. (Perley.)

*Tautoga Americana*, Storer, Mem. Am. Ac. v, 276, pl. xx, fig. 2.

Genus *Tautogolabrus* Gthr.

Opercles (including interopercle) scaly. Teeth in a band. D. xvii - xix. 9 - 11. A. iii, 8 - 9.

*Tautogolabrus adspersus* Gill ex Walb. Cunner. (Perley.)

*Ctenolabrus coeruleus*, Storer, Mem. Am. Ac. v, 274, pl. xx, fig. 1.

## SCIAENIDÆ (Cuv.) GTHR.

## OTOLITHINÆ Gill.

Body fusiform. Lower jaw projecting. Vertebrae about 14 + 10.

Genus *Cynoscion* Gill.

*Cynoscion regalis* Gill ex Schn. Weak-fish.

*Otolithus regalis*, Storer, Mem. Am. Ac. v, 122, pl. ix, fig. 1.

## POMATOMIDÆ GILL.

## POMATOMINÆ Gill.

Teeth compressed. Anal fin moderate.

Genus *Pomatomus* Lac.

*Pomatomus saltatrix* Gill ex Linn. Blue-fish.

*Temnodon saltator*, Storer, Mem. Am. Ac. v, 276, pl. xx, fig. 2.

## SCOMBRIDÆ (Cuv.) GILL.

## SCOMBRINÆ (Bon.) Gill.

Dorsal fins distant. Tail with cutaneous keels.

Genus *Scomber* (L.) Cuv.

Body slender, with no-enlarged scales in front. Finlets 5 - 6.

*Scomber grex* Mitch., 1814. Mackerel.

*Scomber vernalis*, Storer, Mem. Am. Ac. v, 132, pl. xi, fig. 2.

## ORCYNINÆ Gill.

Dorsal fins generally approximated. Tail with cutaneous keels.

Genus *Orcynus* (Cuv.) Gill.

Lateral line simple. Vomer and palatines as well as jaws, with small teeth. D. xii - xv.

*Orcynus secundo-dorsalis* Gill ex Storer. Horse-mackerel; Albicore. (Perley.)

*Thynnus secundo-dorsalis*, Storer, Mem. Am. Ac. v, 143, pl. xii.

## XIPHIIDÆ BON.

## XIPHIINÆ (Bon.) Gill.

Ventral fins obsolete.

Genus *Xiphias* (L.) Cuv.

Tail with a single cutaneous keel. Dorsal fin in young, entire behind; in adult, with the greater portion of the spinous part obsolete.

*Xiphias gladius* Linn. † Sword-fish. (Perley.)

*Xiphias gladius*, Storer, Mem. Am. Ac. v, 149, pl. xiii, fig. 2.

## GASTEROSTEIDÆ BON.

## GASTEROSTEINÆ (Bon.) Brevoort.

Body more or less fusiform. Head conic or sub-conic.

Genus *Gasterosteus* (L.) Brev.

Body stout, fusiform. Free dorsal spines 2 - 3.

*Gasterosteus biaculeatus* (Shaw) Mit.\* Stickleback. (Perley.)

The species of this genus require a thorough re-examination.

Genus *Pygosteus* Brevoort.

Body elongated, sub-fusiform. Free dorsal spines 6 - 10.

*Pygosteus occidentalis* Brev. ex Cv.\*

*Pygosteus Dekayi* Brev. ex Ag.\*

These species likewise require confirmation.

## SCORPÆNIDÆ (Sw.) GILL.

## SCORPÆNINÆ (Bon.) Gill.

D. xi - xv. Spinous and soft dorsals connected.

† On the point of sending this for publication, I received from Mr. Jones of Halifax, a figure of two caudal vertebrae of this species obtained while dredging in the harbor of Halifax.

Genus *Sebastes* Cuv.

D. xiv + i. 13. - 15. A. iii. 6 - 8. Vertebrae in increased number. (c. 12 + 19).

*Sebastes norvegicus* Cuv.\*

*Sebastes norvegicus*, Cuv. et Val., Nat. Hist. des Pois., iv, 327, pl. 87.

*Sebastes viviparus* Kroyer. Rose-fish; Red sea-perch; Snap-per. (Perley.)

*Sebastes norvegicus*, Storer, Mem. Am. Ac. v, 86, pl. vii, fig. 1.

## HEMITRIPTERINÆ GILL.

D. xv + x. Spinous and soft dorsals separated.

## HEMITRIPTERUS CUV.

*Hemitripterus Acadianus* Storer ex Walb.

*Hemitripterus Acadianus*, Storer, Mem. Am. Ac. v, 83, pl. vii, fig. 4.

## COTTIDÆ (Rich.) GILL.

## COTTINÆ (Bon.) GILL.

Head large. First dorsal moderate, generally oblong, mostly behind head.

Genus *Cottus* Linn.

Branchial membrane partly free below. D. viii - x | 13 - 17. Teeth on vomer.

*Cottus granlandicus* Cuv. Sculpin; Bull-head. (Perley.)

*Acanthocottus variabilis*, Storer, Mem. Am. Ac. v, 74, pl. iv, fig. 1.

Pre-opercular spines 3; the upper not extending as far as the opercular.

*Cottus Labradoricus* Gthr. ex Grd.

*Acanthocottus Labradoricus*, Gil., Boston Journ. Nat. Hist.

Pre-opercular spines 4; the upper not extending as far as the opercular.

*Cottus octodecim-spinosus* Mitch. Sculpin; Bull-head. (Perley.)

*Acanthocottus Virginianus*, Storer, Mem. Am. Ac. v, 76, pl. iv, fig. 2.

Pre-opercular spines 3; the upper extending beyond the opercular one.

Genus *Gymnacanthus* Sw.

Branchial membrane free below around margin. Vomerine teeth, none. D. ix - x | 13 - 16.

*Gymnacanthus patris* Gill ex Storer.

*Acanthocottus patris*, Storer, Boston Journ. Nat. Hist. vi, 250, pl. 7, fig. 2.

## AGONIDÆ (Sw.)

## ANOPLAGONINÆ Gill.

Spinous dorsal fin obsolete.

Genus *Aspidophoroides* Lac.

Teeth on jaws only.

*Aspidophoroides monopterygius* Storer, 1839.

*Aspidophorus monopterygius*, Storer, Mem. Am. Ac. v, 80, pl. 8, fig. 1 (extremely bad).

## TRIGLIDÆ (Bon.) BLKR.

## DACTYLOPTERINÆ Gill.

Pectoral fins in adult excessively large, divided into an upper small and a lower larger part, and with no inferior thickened free rays.

Genus *Dactylopterus* Lac.

*Dactylopterus volitans* Lac.

*Dactylopterus volitans*, Storer, Mem. Am. Ac. v, pl. vi, fig. 5, 6.

## XIPHIDIONTIDÆ† GILL.

Body compressed and ribbon-shaped. Dorsal fin nearly uniform, entirely composed of robust spines.

Genus *Muraenoides* Lac.

Branchiostegal membrane free below. Anal fin with two simple spines.

*Muraenoides ingens* Gill.\*

*Gunnellus ingens*, Storer, Boston Journ. Nat. Hist. vii.

*Muraenoides mucronatus* Gill.

*Gunnellus mucronatus*, Storer, Mem. Am. Ac. v, 260, pl. xvii, fig. 2.

## ANARRHICADIDÆ GILL.

Genus *Anarrhicas* Linn.

Body robust. Caudal convex free from the dorsal and anal.

*Anarrhicas vomerinus* Ag.\* Wolf fish; Sea-wolf. (Perley.)

*Anarrhicas vomerinus*, Storer, Mem. Am. Ac. v, 265, pl. 18, fig. 1.

† The much elongated, ribbon-shaped body, form of head, structure of dorsal and pectoral fins, &c., appear to indicate that the centronotoid blennioids represent a true family.

## STICHÆIDÆ GILL.

Genus *Leptoblennius* Gill.

Body very slender, with no lateral line. Teeth only on jaws.

\* *Leptoblennius serpentinus* Gill.

*Blennius serpentinus*, Storer, Mem. Am. Ac. v, 257, pl. 17, fig. 1  
(poor).

Genus *Eumesogrammus* Gill.

Body moderately elongated, with the lateral line divided into a superior and larger median branches.

*Eumesogrammus sub-bifurcatus* Gill.

*Pholis sub-bifurcatus*, Storer, Mem. Am. Ac. v, 258.

## CRYPTACANTHIDÆ GILL.

Genus *Cryptacanthodes* Storer.

*Cryptacanthodes maculatus* Storer.

*Cryptacanthodes maculatus*, Storer, Mem. Am. Ac. v, 82, pl. viii, f. 6.  
Body and fins ruddy, with dark spots.

*Cryptacanthodes inornatus* Gill.† Ghost-fish.

*Cryptacanthodes inornatus*, Gill Proc. Ac. Nat. Sc. Phila., 1863, 332.  
Body and fins whitish, immaculate.

## CYCLOPTERIDÆ (Bon.)

## CYCLOPTERINÆ (Bon.) Gill.

Body contracted. Dorsal fins, two, the first spinous.

Genus *Cyclopterus* Linn.

Plates in one dorsal, and on each side in two lateral and one abdominal rows. First dorsal very small.

*Cyclopterus lumpus* Linn.

*Lumpus anglorum*, Storer, Mem. Am. Ac. viii, 402, pl. 32, fig. 2.

## LIPARIDINÆ GILL.

Body elongated. Dorsal single, entire.

Genus *Liparis* (Art.)

Teeth triscuspid. Ventral disk below posterior half of head.

*Liparis*—.

*Liparis vulgaris*, Fortin in Rep. Com. Crown Lands, Canada,  
1863, p. 161.

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† *C. inornatus* has been signalized from Halifax by Mr. Jones, since the transmission of this article for publication, under the name of *C. maculatus*, (this Journal, p. 129, April, 1865).

## SUB-ORDER PEDICULATI.

- I. Branchial apertures below, in or behind the inferior axillæ of the pectoral fins. Lower jaw projecting. LOPHIIDÆ.
- II. Branchial apertures above in the axillæ of the pectoral fins. Mouth subterminal or inferior, the lower jaw being received within the upper. MALTHEIDÆ.

LOPHIIDÆ (Raf.) Gill.

Genus *Lophius* (Linn.) Cuv.

*Lophius Americanus* Val.

*Lophius Americanus*, Storer, Mem. Am. Ac. v, 266, pl. xviii, fig. 2.

MALTHEIDÆ (BLKR.) GILL.

MALTHEINÆ Gill.

Disk heart-shaped, produced at the snout; body robust.

Genus *Malthe* Cuv.

\* *Malthe cubifrons* Rich.

*Malthe cubifrons*, Rich., Fauna Bor. Am., Fishes, 103 (pl. 96).

## SUBORDER JUGULARES.

- I. Branchial apertures very large, continuous, the membrane cleft far forwards. GADIDÆ.

GADIDÆ (Cuv.)

MERLUCIINÆ (Sw.) Gill.

Dorsal fins two; first well developed; second, as well as anal, emarginated behind middle.

Genus *Merlucius* Raf.

*Merlucius bilinearis* Gill ex Mitch. Silver-hake of Grand Haven; Whiting of St. Johns. (Perley.)

*Merlucius albidus*, Storer, Mem. Am. Ac. vi, 363, pl. 28, fig. 2.

GADINÆ (Bon) Gill.

Dorsal fins three; anal two.

Genus *Pollachius* (Nilss.)

Mouth moderate, lower jaw longer, with barbel obsolete or rudimentary.

*Pollachius carbonarius* Bon.\* Pollock; Sea-salmon. (Perley.)

*Merlangus purpureus*, Storer, Mem. Am. Ac. vi, 358, pl. 28, fig. 3.



Genus *Gadus* (Linn.) Bon.

Mouth large. Lateral line white. Anus under second dorsal fin. Size large.

*Gadus morrhua* Linn.

*Gadus arenosus* (Mitch.)† Cod or Cod-fish.

*Morrhua Americana*, Storer, Mem. Am. Ac. vi, 343, pl. 27, fig. 4.

Genus *Microgadus* (Gill).

Mouth large. Anus under first dorsal fin. Size small.†

*Microgadus tomcodus* (Walb.) Tomcod; Frost-fish. (Perley.)

*Morrhua pruinosa*, Storer, Mem. Am. Ac. vi, 357, pl. 27, fig. 5.

Genus *Melanogrammus* Gill.

Mouth rather small. Lateral line black.

*Melanogrammus æglifinus* Gill ex Linn. Haddock. (Perley.)

*Morrhua æglifinus*, Storer, Mem. Am. Ac. vi, 355, pl. 28, fig. 1.

## PHYCINÆ (Sw.) Gill.

Dorsals two; anal one; Ventrals with styli-form bases, generally forked.

Genus *Phycis* (Raf.)

Caudal convex behind.

*Phycis chuss* Gill ex Walb. Ling; American-hake. (Perley.)

*Phycis filamentosus*, Storer, Mem. Am. Ac. vi, 367, pl. 29, fig. 4.

Scales in about 110 transverse rows. Mouth blotched with dark purple inside.

*Phycis tenuis* Gill.

*Phycis Americanus*, Storer, Mem. Am. Ac. vi, 365, pl. 29, fig. 3.

Scales in 135—140 transverse rows. Mouth minutely punctulated with black within.

Genus *Urophycis* Gill.

Caudal emarginated behind.

*Urophycis regius* Gill.

*Gadus* (*Phycis*) *punctatus*, Rich. F. B. A. III, Fish p. 253, (woodcut).

† Probably not distinct from *G. morrhua*.

‡ *Gadus* and *Microgadus* are trenchantly distinguished by important anatomical characters, for a knowledge of which reference is made to the Proc. Ac. Nat. Sc. Phila. 1865, p. 69.

## LOTINÆ Gill.

Dorsals two; posterior as well as anal entire.

Genus *Lota* Cuv.

Anterior dorsal much behind scapular region. Teeth not enlarged.

*Lota lacustris* Gill ex Walb. Fresh-water cusk. (Perley.)

## CILIATINÆ Gill.

Dorsals two; anterior fringed, with a longer ray in front.

Genus *Rhinonemus* Gill.

Head depressed behind, snout with cirrus.

*Rhinonemus caudacuta* Gill ex Storer. (Bell.)

*Motella caudacuta*, Storer, Mem. Am. Ac. vi, p. 361, pl. 29, fig. 1.

Genus *Ciliata* Coch.

Head and body compressed, *silvery*.

\* *Ciliata argentata* Gill ex Reinh.

## BROSMINÆ Sw.

Dorsal single.

Genus *Brosmius* Cuv.

*Brosmius Americanus* Gill.

*Brosmius flavescens*, Storer, Mem. Am. Ac.

Lower jaw shorter, with an undivided barbel.

*Brosmius flavescens* Lcs.\*

Lower jaw longer, with a forked barbel.

## SUB-ORDER HETEROSOMATA.

## PLEURONECTIDÆ.

## PLEURONECTINÆ, Gill.

Mouth small, the supramaxillary ending before or under front of eye.

Genus *Pseudopleuronectes* Blkr.

Body with imbricated ctenoid scales. Teeth fixed, incisorial. Lateral line not arched in front.

*Pseudopleuronectes Americanus* Gill ex Walb. Common flounder. (Perley.)

*Platessa plana*, Storer, Mem. Am. Ac. viii, 389, pl. 30, fig. 2.

*Platessa pusilla*, Dek. (young).†

† *Platessa pusilla* DeKay = *Pseudopl. Americanus*, young.

Genus *Limanda* Gottsche.

Body with rough imbricated scales. Teeth fixed, incisorial.  
Lateral line arched in front.

*Limanda rostrata* Gill. Fluke or common dab. (Perley.)

*Platessa rostrata*, Storer, Boston Jour. Nat. Hist., vi, pl. 8, fig. 2.

## HIPPOGLOSSINÆ Gill.

Mouth large. Ventrals lateral.

Genus *Hippoglossoides* Gottsche.

Body thick. Scales ctenoid; caudal entire.

\* *Hippoglossoides platessoides* Gill ex Fab.

*Hippoglossoides platessoides*, Gill, Proc. Ac. Nat. Soc. 1864.

Genus *Pomatopsetta* Gill.

Body thin. Scales mostly cycloid, caudal entire.

*Pomatopsetta dentata* Gill.

*Platessa dentata*, Storer, Mem. Am. Ac. viii, 391, pl. 30, fig. 3.

Genus *Hippoglossus* Cuv.

Body robust, with minute smooth scales, caudal fin emarginated.

*Hippoglossus Americanus* Gill. Halibut. (Perley.)

*Hippoglossus vulgaris*, Storer, Mem. Am. Ac. viii, pl.

## SUB-ORDER ABDOMINALES.

## FAMILIES.

- I. Head plane above and behind. Pectorals inserted rather high on the sides.
- a. Body elongated, with the back and abdomen parallel.  
Lateral line distinct, very low. SCOMBERESOCIDÆ.
- β. Body oblong, subfusiform or oval, with no lateral line.  
Head flat above, with large scales. POECILIIDÆ.
- II. Head more or less convex transversely above. Pectorals inserted very low on sides.
- a. Dorsal fin more or less in advance of anal.  
\* Adipose dorsal finlet present behind. A lateral line.  
SALMONIDÆ.
- \*\* Adipose dorsal finlet none. No lateral line.  
CLUPEIDÆ.
- β. Dorsal and anal fins opposite, far behind.  
\* Head with oblong conical depressed snout. ESOCIDÆ.
- \*\* Head rounded in front, with oblique tympanic and opercular apparatus, and an enormous mouth.  
STOMIATIDÆ.

## SCOMBERESOCIDÆ Bon.

## SCOMBERESOCINÆ Gill.

Body compressed; jaws both produced, slender; dorsal and anal posterior rays developed as separate finlets.

Genus *Scomberesox* Lac.

*Scomberesox scutellatus* Les.

*Scomberesox scutellatus*, Storer, Mem. Am. Ac. vi, 315, pl. 24, fig. 4.

## BELONINÆ Bon.

Body little compressed; jaws both produced, strong and with well-developed teeth; dorsal and anal simple behind.

Genus *Belone* Cuv.

*Belone longirostris* Gill ex Mitch.

*Belone truncata*, Storer, Mem. Am. Ac. vi, 314, pl. 24, fig. 3.

## POECILIIDÆ Bon.

## HYDRARGYRINÆ Gill.

Teeth acute. Dorsal and anal, generally subequal and opposite.

Genus *Hydrargyra* Lac.

Branchiostegal rays six.

*Hydrargyra majulis* Val. ex Walb. Mammy-chub. (Perley.)

*Hydrargyra flavula*, Storer, Mem. Am. Ac. v, pl. 23, fig. 5 (male, with 12-15 vertical bands), and 6 (female with 2-3 longitudinal lines).

Genus *Fundulus* Lac.

Branchiostegal rays five.

*Fundulus pisculentus* Val. Big killy-fish; Minnow. (Fortin.)

*Fundulus pisculentus*, Storer, Mem. Am. Ac. v, 294, pl. 23, fig. 3 (male, with vertical light bands), and fig. 4 (female, uniform).

## SALMONIDÆ Cuv.

## SALMONINÆ Bon.

Teeth acute. Stomach not caecal; pyloric caeca numerous.

Genus *Salmo* (Linn.)

Body spotted in adults. Mouth large, with well-developed teeth.

*Salmo salar* Linn.

*Salmo salar*, Storer, Mem. Am. Ac. vi, 320, pl. 25, fig. 2.

*Salmo sebago* Grd. Togue. (Perley.)

*Salmo sebago*, Grd., Proc. Acad. Nat. Sc., Phila., 1853.

*Salmo fontinalis* Mitchell. Brook Trout. (Perley.)

*Salmo fontinalis*, Storer, Mem. Am. Ac. vi, 322, pl. 25, fig. 3.

*S. glaucus* Girard

*S. carolinensis* H. Smith

*S. coniferus* De Kay

Genus *Coregonus* (Art.) Ag.

Body never spotted. Mouth small, toothless, with the lower jaw shorter.

*Coregonus* ——. Gizzard-fish. (Perley.)

*Coregonus albus*, Perley, Report on Sea and River Fishes of New Brunswick, p. 204.

## ARGENTININÆ (Bon.) Gill.

Teeth acute. Stomach cœcal, and at the pyloric extremity provided with few cœca.

Genus *Osmerus* (Art.)

Sexes scarcely distinguishable externally. Scales in both regularly imbricated. Pectorals and ventrals moderate (P. 10-12).

*Osmerus mordax* Gill ex Mitch. Smelt. (Perley.)

*Osmerus viridescens*, Storer, Mem. Am. Ac. vi.

Genus *Mallotus* Cuv.

Sexes very dissimilar: scales of the male villose or pointed in a lateral band; pectorals and ventrals very large and overlapping one another; scales of the female as in *Osmerus*. (P. 18-20.)

*Mallotus villosus* Cuv. Capelin. (Perley.)

*Salmo* (*Mallotus*) *villosus*, Rich. F. B. A., iii, Fishes, p. 187.

## CLUPEIDÆ (Cuv.)

## CLUPEINÆ (Bon.)

Body much compressed, fusiform. Head conic, with oral cleft longitudinal and the lower jaw projecting.

Genus *Clupea* (Linn.)

Scales simple. Upper jaw little emarginated at symphysis. Mouth well toothed.

*Clupea elongata* Les.

*Clupea elongata*, Storer, Mem. Am. Ac. vi, 330, pl. 26, fig. 1.

Genus *Alosa* Cuv.

Scales simple. Pre-opercular with a very short horizontal process; checks very high. Upper jaw deeply notched at symphysis. Mouth toothless, or with supramaxillars only toothed.

*Alosa tyrannus* Gill ex Lat.

*Alosa praestabilis*, Storer, Mem. Am. Ac. vi, 332, pl. 26, fig. 2.

Genus *Pomolobus* (Raf.) Gill.

Scales simple. Pre-operculum with an oblong horizontal process; cheeks longer than high. Upper jaw notched at symphysis. Roof of mouth edentulous.

*Pomolobus pseudo-harengus* Gill ex Wilson. Alewife; Gaspe-reau. (Perley.)

*Alosa cyanonotus*, Storer, Mem. Am. Ac. vi, 339, pl. 27, fig. 1.

*Alosa tyrannus*, Storer, Mem. Am. Ac. vi, 337, pl. 26, fig. 3.

Genus *Brevoortia* Gill.

Scales ciliated or pectinated behind!

*Brevoortia menhaden* Gill ex Mitch.

*Alosa menhaden*, Storer, Mem. Am. Ac. vi, 336, pl. 26, fig. 4.

## ESOCIDÆ (Cuv.)

Genus *Esox* Linn.

*Esox reticulatus* Les. Pike; Pickerel. (Fortin.)

*Esox reticulatus*, Storer, Mem. Am. Ac. vi, 311, pl. 24, fig. 1.

## STOMIATIDÆ GILL.

Genus *Malacosteus* Ayres.

Body naked. Gape rectilinear. Opercular bones much reduced.

\* *Malacosteus niger* Ayres.

*Malacosteus niger*, Ayres, Boston Journ. Nat. Hist.

## SUB-ORDER EVENTOGNATHI GILL.

1. Lower pharyngeal bones with 1-3 rows of teeth, the primary row containing only 5-7. CYPRINIDÆ.

2. Lower pharyngeal bones with a row of numerous pectiniform teeth. CATASTOMIDÆ.

## CYPRINIDÆ (Cuv.) GILL.

Genus *Stilbuis* (Dek.) Gill.

Head and body much compressed, silvery. Back much arched. Lateral line very low.

*Stilbuis Americanus* Gill ex Lac. Shiner; Carp. (Perley.)

*Leucosomus Americanus*, Storer, Mem. Am. Ac. vi, 283, p. 21, fig.

2. D. 9-10, A. 15-16, P. 15-17, V. 9.

Genus *Hypsilepis* Baird.

Head and body thick, the former large and short, with tubercles in the breeding season. Scales higher than long. Lateral line submedian, little decurved.

*Hypsilepis cornutus* Grd. ex Mit.\* Roach; Red-fin. (Perley.)

*Hypsilepis cornutus*, Storer, Mem. Am. Ac. vi, 284, pl. 21, fig. 3.

D. 8, A. 9, P. 15, V. 8.

Genus *Semotilus* Raf.

Head and body thick, elongated. Scales quadrate or oblong. Lateral line submedian, little decurved.

*Semotilus pulchellus* Gill.\* Roach-dace. (Perley.)

*Chelonemus pulchellus*, Storer, Mem. Am. Ac. vi, 286, pl. 22, fig. 2.

D. 9-10, A. 9-10, P. 16-17, V. 8.

Genus *Rhinichthys* Ag.

Head and body thick, elongated. Scales oblong. Lateral line nearly straight, and generally with a black band extending from snout to caudal.

*Rhinichthys atronusus* Ag. ex Mit.\* Brook minnow.

*Argyreus atronusus*, Storer, Mem. Am. Ac. vi, 288, pl. 21, fig. 4.

D. 8, A. 8, P. 14-15, V. 8.

## CATASTOMIDÆ GILL.

## CATASTOMIDÆ (Heck.) Gill.

Dorsal short, above ventrals.

Genus *Catostomus* (Lcs.) Ag.

Snout long. Lateral line present, nearly straight. Lips papillated.

*Catostomus Bostoniensis* Lcs.\* Sucker.

*Catostomus Bostoniensis*, Storer, Mem. Am. Ac. vi, 290, pl. 22, fig. 3.

D. 14-16, A. 9, P. 18, V. 10.

Genus *Moxostoma* (Raf.) Ag.

Snout short. Lateral line obsolete. Lips plicated.

*Moxostoma oblongum* Ag. ex Mit. Chub. (Perley.)

*Catostomus gibbosus*, Storer, Mem. Am. Ac. vi, 291, pl. 22, fig. 4.

D. 15-17, A. 9-10, P. 16, V. 10.

## ORDER APODES.

## ANGUILLIDÆ Kaup.

Body with patches of oblong scales diagonally disposed.

Genus *Anguilla* Thunberg.*Anguilla Bostoniensis* St. ex Les. Ecl. (Perley.)*Anguilla Bostoniensis*, Storer, Mem. Am. Ac. viii, 409, pl. 33, fig. 1.The fish (*Leptocephalus gracilis*, Storer) regarded by me as being probably the larva of the conger, has been found along the coast of Maine.†

## ORDER NEMATOGNATHI GILL.

## SILURIDÆ (Cuv.) Bkr.

## BAGRINÆ.

Genus *Amiurus* (Raf.) Gill.‡

Head depressed, with the supra-occipital free behind. Adipose fin well developed; caudal nearly even,

*Amiurus*———. Cat-fish. (Perley.)

Species uncertain; not seen by me. ¶

## ORDER PLECTOGNATHI.

## SUB-ORDER SCLERODERMI.

## BALISTIDÆ Cuv.

## BALISTINÆ (Bon.)

First dorsal fin with two or three spines.

Genus *Capriscus* Sw.

Postbranchial scales enlarged; dorsal and anal elevated in front.

*Capriscus fuliginosus* Gill ex Dekay.*Balistes fuliginosus*, Dekay, N. Y. Fauna, p. 339, pl. 57, fig. 188.

(Nova Scotia. J. M. Jones, Esq., in litt.)

## MONACANTHINÆ Kaup.

Dorsal spine single.

Genus *Stephanolepis* Gill.

Scales with a coroniform crest.

*Stephanolepis Massachusettensis* Gill ex Storer. \* (Jones.)*Monacanthus Massachusettensis*, Storer, Mem. Am. Ac. viii, 425, pl. 34, fig. 4.† The *Anguilla* or *Isognatha oceanica* Dekay is the American Conger.‡ As the etymology of the name *Amiurus* has been variously misunderstood, one deriving it from *Amia* and *ovpa*, and another from *Ara* (shovel) and *ovpa*, it will not be superfluous to state that it alludes to the "tail entire" (Raf.), and is formed of the privative *a* and *μειωπος* (curtailed). The name is a most happy one both in its reference to a marked generic character and in its concordance with its derivatives.

It may be here remarked that the Siluroids, Mormyroids, Sternarchoids, and Gymnotoids, are closely related.



## ORDER LOPHOBRANCHII.

SYNGNATHIDÆ (Bon.)

SYNGNATHINÆ (Bon.)

Head and body much elongated and straight. Males with a caudal egg-pouch open throughout.

Genus *Syngnathus* Linn.

Body heptagonal, slender, with the breast-shields rugose, and the jaws sub-equal.

*Syngnathus Peckianus* Storer. (Dawson.)*Syngnathus Peckianus*, Storer, Mem. Am. Ac. viii, 412, pl. 33, fig. 3.

GANOIDEI.

## ORDER CHONDROSTEI.

STURONIDÆ (Rich.)

Genus *Acipenserina* (Bon.)

Both pseudobranchiæ and spiracula developed.

*Acipenser oxyrinchus*, Storer, Mem. Am. Ac. viii, 431, pl. 35, fig. 4.

## ORDERS OF ELASMOBRANCHI.

Branchial apertures lateral.

Branchial apertures inferior.

SQUALI

RALE.

## FAMILIES OF SQUALI.

I. Anal fin present.

A. Branchial apertures entirely in front of pectorals. Caudal nearly lunate. LAMNIDÆ.

AA. Branchial aperture behind above pectoral.

B. Caudal with its upper lobe extremely long. Nictitating membrane obsolete. ALOPECIDÆ.

BB. Caudal with its upper lobe moderately elongate. Nictitating membrane of eyes present.

GALEORHINIDÆ.

II. Anal fin absent.

Dorsals with spines in front.

SPINACIDÆ.

Dorsals without spines.

SCYMNIDÆ.

LAMNIDÆ Mull. et Henle.

LAMNINÆ Gill.

Branchial aperture moderate. Teeth well developed.

Genus *Isuropsis* Gill.

Teeth nail-shaped, long, prismatic and acute. Dorsal nearly midway between pectorals and ventrals.

*Isuropsis glauca* Gill ex M. & H. Porbeagle. (Fortin.)

*Lamna punctata*, Stead, Dekay.

## CETORHININÆ Gill.

Branchial apertures extremely large. Teeth minute.

Genus *Cetorhinus* Blainv.

*Cetorhinus maximus* Gray ex Linn. Basking-shark. (Perley.)

*Selachus maximus*, Dekay.

## ALOPECIDÆ Owen.

Genus *Alopias* Raf.

*Alopias vulpes* Bon. ex Linn. Thresher-shark. (Perley.)

*Carcharias vulpes*, Dekay.

## GALEORHININIDÆ GILL.

## GALEORHININÆ Gill.

Teeth compressed, trenchant, entire or crenulated.

Genus *Scoliodon* Mull. & Henle.

Teeth with smooth edges, and with point directed towards the corners of the mouth.

\* *Scoliodon terræ-novæ* Gill ex Rich.

*Squalis (carcharias) terræ-novæ*, Rich., F. B. A., Fishes, 289.

## SPINACIDÆ (OWEN).

Genus *Squalus* (Linn.) Raf.

Teeth of jaws similar, subquadrate, with a nearly horizontal cutting-edge.

*Squalus Americanus* Gill ex St. Dog-fish. (Perley.)

*Spinax acanthias*? Dekay.

## SCYMNIDÆ (OWEN).

Genus *Somniosus* Les.

Teeth above narrow, triangular, below subquadrate, with a nearly horizontal cutting-edge.

*Somniosus microcephalus* (Gray).

*Scymnus brevipinna*, Dekay.

## FAMILIES OF RAJÆ.

## RAJIDÆ (Bon).

Genus *Raja* Linn.*Raja laevis* Mitchill. Skate (Perley.)*Raja laevis*, Dekay, N. Y. Fauna, 370.~~*Raja erinacea* Mitchill. Hedge-hog ray. (Perley.)~~*Raja erinacea*, Dekay, N. Y. Fauna, 372, pl. 78, fig. 276.

The identification of these species requires confirmation.

## MARSIPOBRANCHIÆ.

## ORDER HYPEROARTIÆ.

## SUB-ORDERS.

Palate not perforated.

## HYPEROARTII.

Palate perforated by the posterior aperture of the naso-palatine tube.

## HYPEROTRETI.

## PETROMYZONTIDÆ Bon.

Genus *Petromyzon* (Linn.) Gray.

Palatal teeth two, conic, closely approximated. Lingual teeth two, serrate.

*Petromyzon Americanus* Say. American lamprey. (Perley.)*Petromyzon Americanus*, Dekay, N. Y. Fauna, 379, pl. 66, fig. 216.

## ORDER HYPEROTRETI.

## MYXINIDÆ Mull.

Genus *Myxine* Linn.*Myxine glutinosa* Girard.\**Myxine glutinosa*, Girard Proc. Acad. N. S. Phila. 1888.

## SUPPLEMENTARY NOTE.

Having been recently engaged in a revision of the classification of the fishes of our coast, I embrace this opportunity of remarking that the Sparoids are among those hitherto misunderstood. The *Pagrus argyrops* Cuv., *Sargus arenosus* Dekay, and *Sargus ambassis* Gunther, should be united and referred to a new genus which differs widely from both *Pagrus* and *Sargus*; the teeth in front are trenchant and compressed but very narrow, and in front

of the dorsal there is a recumbent spine. The genus may be named *Stenotomus*.\* The *Sargus probatocephalus* agrees with *Stenotomus* and differs from *Sargus* in being armed with a recumbent dorsal spine, and may be called *Archosargus*.† The anatomical and full generic characters will be hereafter exposed.

I may also add that among the Cyprinodonts, the *Fundulus zonatus* Cuv., *F. cingulatus* Cuv., and *Hydrargyra luciae* Baird, should be separated from *Fundulus* and *Hydrargyra*, to form a distinct genus, (*Micristius* †) distinguished by its physiognomy and the small number of dorsal rays. The nominal species probably represent sexual conditions.

Another family involved in great confusion is that of the Clupeidae. An examination of extensive material has convinced me that the number of species has been very much over-estimated and that too much attention has been paid to the dentition. The various osteological modifications, &c. afford much safer characters. I can only recognize with certainty seven species of Clupeinae as inhabitants of the eastern coast to the northward.

- Same fish
1. *Clupea harengus* L. (Greenland fide Reinhardt, &c.)
  2. *Clupea elongata* Les.
  3. *Pomolobus mediocris* Gill ex Mitch. = *Meletta mattawocca*, Cuv. = *Alosa lineata* Storer.
  4. *Pomolobus pseudo-harengus* Gill ex Wilson = *Clupea virescens* Dekay. = *Alosa cyanonoton* St. = *Meletta venosa* Cuv. = *Genipermy*  
*Alausella parvula* Gill (y.g.), = *Alosa tyrannus* Storer  
 = *Clupea fasciata* Les.
  5. *Clupanodon thrissa* Lac. = *Meletta thrissa* Cuv. = *Opisthonema thrissa* Gill.
  6. *Alosa tyrannus* Gill ex Latrobe = *Alosa praestabilis* Dekay. *Shad*
  7. *Brevortia menhaden* Gill ex Mitchell = *Alosa menhaden* Cuv.

Washington City, U.S.A., Aug., 1865.

\* *Στενος*, narrow; *τομὸς*, incisive. The narrow incisors are especially characteristic of *Stenotomus*.

† *Ἀρχος*, ruler; *Σάργος*, *Sargus*. The sheeps-head (*Archosargus probatocephalus*) is pre-eminent among the Sparoids for the delicacy of its flesh as well as its size.

‡ *Μικρὸς*, small; *ἰστὶον*, sail. *Micristius* is well distinguished by its small dorsal fin.



