SYNOPSIS OF THE GENERA OF FISHES

TO BE LOOKED FOR

IN INDIANA.

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It is the intention of the author of this paper to publish as soon as sufficient material is procured, a complete account of the fishes of this State. In order to aid the observations of others, I have here prepared a simple artificial "Key," based on the most obvious external character, by the use of which, it is hoped, little difficulty will be found in referring any one of our fishes to its proper place in the system of classification.

My materials thus far, have been my own collections, made the past autumn in White River; my collections the past year in Wisconsin and Lake Michigan; the valuable collections of Dr. John Sloan, in the Ohio River and its tributaries about New Albany; a few specimens from the southern part of the State, in the State Cabinet and many specimens from the Wabash River, procured of fishermen.

It is hoped that the publication of this synopsis will encourage observers in different parts of the State, to identify the fishes of their localities and to send lists of the same to Prof. Cox, or to me. We also desire specimens of any unusual forms, and we will be very happy to examine and identify such specimens and as far as possible to answer any questions concerning them.

But few technical terms have been used in the following synopsis, and those few are either defined where they occur, or are explained in the succeeding paragraphs.

HOW TO USE THE KEY.

Let us suppose that we have caught a certain species of fish, about a foot long, which abounds in almost every stream in this country and which is known, like some thirty or forty others, by the general name of sucker.

We begin with "A." "*Tail homocercal.*" The two lobes of the forked tail are about alike, and following the directions given at the end of the line, we pass to "B." Our fish is scaly and we may note, that the scales are "Cycloid," (smooth and showing concentric rings) not "Ctenoid," (rough edged). We are sent to "C." There is no barbel about the mouth nor does our fish agree with the characters ascribed to "Lota," so we pass to "D." It is not one of the blind cave-fishes. So we go to "E."

Here we find that the ventral fins are abdominal (under the abdomen) and that the dorsal fin is single, composed of soft rays only, without any spines. Here we desire to know the names of the fins: On the back is the "dorsal," sometimes divided into two, in that case a first and second dorsal. Sometimes behind the dorsal we have a fleshy expansion, (in trout and cat fishes). Although this is not a true fin, it is known as the adipose dorsal.

Immediately behind the gill covers (opercles) we find the pectoral fins, one on each side, representing the arms or fore limbs, and below or behind these are the ventral fins, likewise paired, and representing the hind limbs. Behind the ventrals is the anal fin and at the end of the tail, the caudal fin.

Each fin is made up of "rays" which when more or less stiff and unbranched, are termed "spines," and when weaker and branching or jointed "soft rays." The number of rays is often of some importance and in counting them pains should be taken not to overlook any of the

smaller ones. The hindmost in the dorsal and anal is usually split to the base and should be counted as one.

From E, we go for some distance to G^2 thence to $L.^2$ There are no teeth in the mouth, but deep in the throat below the gills we will find on dissection two curious arched bones, in these fishes covered with small teeth. These are the pharyngeal teeth, very important in the study of these fishes, but here neglected because not easily got at. We now pass in succession to M^2, N^2, O^2, P^2, U^2. Here we find that our fish has a "lateral line"—a row of modified scales bearing mucous tubes, running along on each side of the fish. Often it becomes necessary to count these scales, and often their number affords specific characters of value.

Under V^2 the first set of characters best suits our fish, and we are sent to the genus, CATOSTOMUS No. 44. We find on turning to the second part, 44, CATOSTOMUS. LeSueur, White Suckers. Catostomus which means in Greek "low mouth," the force of which term we see readily, LeSueur, the name of the naturalist who introduced that term and White Sucker their most common general designation. We also learn that our fish belongs to the family of Catostomidæ or Suckers, and we find a short account of the characters of that curious family. Below are the common vernacular names of the species, the localities from which they are recorded in Indiana, and finally the scientific name of the species most likely to occur here, viz: *Catostomus teres*, the common Sucker of the Eastern States.

ARTIFICIAL KEY TO GENERA.

A. Tail *homocercal*, i. e., upper and lower halves symmetrical, the backbone terminating in the middle of the tail, (as in most fishes.) B.

A. Tail *heterocercal*, i. e., unsymmetrical, the backbone running into the upper lobe, (as in sturgeons, etc.) A^4.

B. Body with scales large or small. C.

B. Body entirely scaleless. X.

C. A barbel (fleshy filament,) at the tip of the lower jaw, dorsal fins two; second very long, (i. e., many rayed,) scales very small. LOTA. 78.

C. No barbel at tip of lower jaw. D.

D. Eyes well developed. E.

D. Eyes concealed, (colorless cave-fishes. T[3].

E. Ventral fins thoracic, (i. e., under the pectoral fins,) first 3 or more rays of dorsal, or whole first dorsal of simple, usually stiff spines. F.

E. Ventral fins abdominal, (i. e., decidedly behind pectorals,) dorsals two, first short and weak, of 4 or 5 flexible spines; body very slender, translucent, a bright silvery band along the sides. LABIDESTHES. 28.

E. Ventral fins abdominal; rayed dorsal single, sometimes preceded by one or two spines. G[2].

E. Ventral fins entirely wanting. V[3].

F. No teeth on the vomer, (front part of roof of mouth); head scaly; anal fin with two spines, the second of which is very strong. HAPLOIDONOTUS. 21.

F. Vomer with teeth (or if not, anal spines weak). G.

G. With two distinct dorsal fins, or one deeply divided. H.

G. A single dorsal fin not deeply divided, spinous part usually rather longest; soft part highest. S.

H. Anal with one or two spines, sometimes slender, appearing like soft rays, (3 in Microperca?) I.

H. Anal with three stout spines. Q.

I. Jaws with stout canine teeth, besides the ordinary small teeth; body elongated, 1 to 2½ feet long. LUCIOPERCA. 2.

I. Jaws with bands of small even teeth. J.

J. No lateral line; body compressed; dorsal with 6 or 7 spines; greenish with dark markings; smallest of all our fresh water fishes; length less than 2 inches.
MICROPERCA. 13.

J. Lateral line present, wanting or indistinct behind. K.

J. Lateral line present, obvious throughout its course. M,

K. Dorsals entirely separate, dorsal spines 8 to 10, sides often with red dots, lateral line arched over pectorals; small compressed species. HOLOLEPIS. 11.

K. Dorsals slightly connected. L.

L. Spinous dorsal elevated, scarcely lower than soft part; about 10 dorsal spines; colors gaudy, green, blue, orange, etc.
ASTATICHTHYS. 9.

L. Spinous dorsal low, little more than half as high as soft part, the spines in adult (males ?) ending in little fleshy knobs, in others pointed; color plain or with black bars or lines of dots. CATONOTUS. 10.

M. Body exceedingly slender (depth 6 or more in length,) scales on sides obvious only along lateral line; 10 dorsal spines; very small fishes, translucent, dotted with black.
PLEUROLEPIS. 12.

M. Body stouter, (depth 6 or less in length,) sides scaly throughout. N.

N. Upper jaw decidedly longest; cheeks, etc. scaly; 13 dorsal spines; sides with dark bars; length 4 to 6 inches.
PERCINA. 5.

N. Upper jaw little if any longer than lower. O.

O. No teeth on the vomer; snout blunt; cheeks, etc., scaly; soft dorsal much larger than anal. HYOSTOMA. 8.

O. Teeth on the vomer; body deep; depth less than 4 times in length; dorsal spines, 13; length, 6 inches or more; sides with dark bars. PERCA. 1.

O. Teeth on the vomer; body slender; depth more than 4 times in length; length less than six inches; sides not truly barred. P.

P. Second dorsal not much, if any, larger than anal or than spinous dorsal; belly with a series of caducous plates along the middle line; mouth wide; cheeks bare; sides with a chain of dark blotches; dorsal spines 12 to 15. ETHEOSTOMA. 6.

P. Second dorsal decidedly larger than anal and spinous dorsal; mouth small, sub-inferior; cheeks scaly; colors various, usually tessellated above; one or two dark lines in front of eye. BOLEOSOMA. 7.

Q. General color, dark greenish; mouth large; young usually with the tail black-tipped and one or more dark lines along sides and on cheeks. MICROPTERUS. 14.

Q. General color silvery, with several dark longitudinal stripes. R.

R. Anal with 12 soft says; the third anal spine longest. ROCCUS. 3.

R. Anal with nine soft rays; the second spine stoutest; large scales on opercles. MORONE. 4.

S. Anal with 8 or 9 spines; dorsal with 11 or 12. CENTRARCHUS. 20[2]

S. Anal with 5 or 6 spines; fins mostly barred. T.

S. Anal with 3 spines. V.

T. Soft dorsal moderate with 10 or 12 rays; scales dark at base giving an appearance of dark stripes; eyes large. AMBLOPLITES. 18.

T. Soft dorsal very high of 15 or more rays. U.

U. Dorsal with 6 spines. POMOXYS. 20.

U. Dorsal with 7 or 8 spines; silvery and greenish mottled. HYPERISTIUS. 19.

V. A supernumerary maxillary bone; mouth very large, oblique, much as in the black bass; lower jaw longest; dorsal spines 10. CHÆNOBRYTTUS. 15.

V. Sides with 5 or 6 distinct black vertical bars; no supernumerary maxillary.
MESOGONISTIUS. 15 (2).

V. No supernumerary maxillary bone; mouth moderate; no black bars. W.

W. Opercle ending behind in a long flap, longer than broad, black, usually not tipped with scarlet.
ICHTHELIS. 17.

W. Opercular flap broader than long, black, usually tipped with scarlet. POMOTIS. 16.

X. No barbels about the mouth. Y.

X. With eight fleshy barbels about the mouth, 4 on each jaw. C^2

Y. No ventral fins; body serpent-like; dorsal and anal united around the tail. Z^2

Y. Ventral fins each of a single sharp spine and a rudimentary ray. Y^3.

Y. Ventral fins developed, of three or more rays each. Z.

Z. Head spineless; ventral fins united into a roundish disk. GOBIOSOMA. 25.

Z. Head very large, with two or more spines; eyes close together; pectoral fins large. A^2.

A^2. Ventrals with 5 rays; teeth on the palate; length 3 to 6 inches. POTAMOCOTTUS. 23.

A^2. Ventrals with 4 rays; no palatine teeth; length 2 to 4 inches. B^2

B^2. Dorsals near together; preopercle with 1 to 3 spines.
URANIDEA. 22.

B^2. Dorsals remote; preopercle with 4 needle-like spines. TRIGLOPSIS. 24.

V. A supernumerary maxillary bone; mouth very large, oblique, much as in the black bass; lower jaw longest; dorsal spines 10. CHÆNOBRYTTUS. 15.

V. Sides with 5 or 6 distinct black vertical bars; no supernumerary maxillary.
MESOGONISTIUS. 15 (2).

V. No supernumerary maxillary bone; mouth moderate; no black bars. W.

W. Opercle ending behind in a long flap, longer than broad, black, usually not tipped with scarlet.
ICHTHELIS. 17.

W. Opercular flap broader than long, black, usually tipped with scarlet. POMOTIS. 16.

X. No barbels about the mouth. Y.

X. With eight fleshy barbels about the mouth, 4 on each jaw. C^2

Y. No ventral fins; body serpent-like; dorsal and anal united around the tail. Z^2

Y. Ventral fins each of a single sharp spine and a rudimentary ray. Y^3.

Y. Ventral fins developed, of three or more rays each. Z.

Z. Head spineless; ventral fins united into a roundish disk. GOBIOSOMA. 25.

Z. Head very large, with two or more spines; eyes close together; pectoral fins large. A^2.

A^2. Ventrals with 5 rays; teeth on the palate; length 3 to 6 inches. POTAMOCOTTUS. 23.

A^2. Ventrals with 4 rays; no palatine teeth; length 2 to 4 inches. B^2

B^2. Dorsals near together; preopercle with 1 to 3 spines.
URANIDEA. 22.

B^2. Dorsals remote; preopercle with 4 needle-like spines. TRIGLOPSIS. 24.

C^2. Adipose fin long, keel-like continuous with the rounded caudal. NOTURUS. 75.

C^2 Adipose fin distinct from caudal. D^2.

D^2 Eyes concealed beneath the skin; blind cave fishes, (thus far found only in E. Penn.) GRONIAS. 77.

D^2 Eyes well developed. E^2.

E^2 Dorsal spine short, enveloped in the thick skin; body elongated. HOPLADELUS. 76.

E^2 Dorsal spine well developed, usually serrated behind. F

E^2. Caudal usually rounded; body short and stout; supra occipital bone, (bone running backward from head under the skin,) free behind. AMIURUS. 74.

F^2. Caudal deeply forked; body elongated; supra occipital bone meeting the bone at base of dorsal fin. ICTALURUS. 73.

G^2. With a second (adipose) dorsal. H^2.

G^2. With no adipose dorsal fin. L^2.

H^2. Dorsal fin high, of 20 or more rays, fins marked with blue. THYMALLUS. 37.

H^2. Dorsal of less than 20 rays. I^2.

I^2 Teeth very stout, scales small, imbedded in the skin. SALMO. 36.

I^2 Teeth feeble or wanting. J^2.

J^2 Scales moderate, ctenoid; teeth small but perfect. PERCOPSIS. 40.

J^2 Scales rather large, cycloid; teeth reduced to slight roughnesses. K^2.

K^2. Body high in our species, much compressed; upper jaw decidedly longest. COREGONUS. 38.

K^2. Body slender in our species, somewhat compressed; lower jaw usually longest. ARGYROSOMUS. 39.

L^2. Jaws entirely destitute of teeth. M^2.

L^2 Jaws with teeth, large or small. V^2.

M^2 Belly not serrated. O^2.

M^2. Belly compressed to an edge, with bony serratures; body compressed, silvery. N^2.

N^2. Last ray of dorsal prolonged into a filament; upper jaw longest. DOROSOMA. 42.

N^2. Last ray of dorsal not filamentous; lower jaw longest. ALOSA. 41.

O^2 Dorsal elongated; high in front, of more than 20 rays; lips fleshy, sucker-like; fishes of large size with large scales, (Buffalo fishes). R^2

O^2 Dorsal moderate of less than 20 rays. P^2

P^2 Lips fleshy, sucker-like, forming a rounded mouth when protracted; pharyngeal teeth numerous, small; fishes of moderate, rarely large size, (Suckers). U^2

P^2 Without fleshy lips, mouth usually small but not truly sucker-like; pharyngeal teeth few and rather large; fishes of small size, rarely a foot in length, (Dace and Minnows). Y^3

R^2. First rays of dorsal very long, half the length of the base of the fin or more, mouth small; inferior; back arched. CARPIODES. 49.

R^2. First rays or dorsal moderately long, less than half the length of the base of the fin. S^2

S^2. Dorsal very long, of about 35 rays; anal 8 rayed. far back, the abdomen therefore being unusually long. CYCLEPTUS. 52.

S^2. Dorsal shorter, of about 30 rays; anal of 9 rays or more; eye small; head large. T^2.

T^2. Mouth inferior, protractile downwards. BUBALICHTHYS. 51.

T^2. Mouth nearly terminal, protractile forwards. ICHTHYOBUS. 50.

U^2. No lateral line; body elliptical; color brassy; young with dark bands. MOXOSTOMA. 48.

U^2. Lateral line present. V^2.

V^2. Scales very small on the front part of the body, becoming much larger behind; air bladder in two parts. CATOSTOMUS. 44.

V^2. Scales nearly as large on the front part of the body as on the tail. W.^{2}.

W^2 Length of the head greater than depth of body; head square on the sides, flattish above and concave between the eyes, which are well back and high up; brownish; young with black blotches. HYLOMYZON. 45.

W^2 Length of head less than depth of body, head rounded above, air bladder in three parts. X^2

X^2 Scales silvery or reddish with bright reflections, in several species black at base; lower fins usually red; pharyngeal bones many toothed below, (as usual among suckers.) PTYCHOSTOMUS. 46.

X^2 Pharyngeal bones with but seven teeth each on the lower half, upper half many toothed; scales reddish; lower fins not red, (a single specimen known of this curious genus procured by Prof. Cope, from Wabash River.) PLACOPHARYNX. 47.

Y^2 Native species; dorsal and anal without serrated spine. Z^2

Y^2 Introduced species; dorsal and anal, each with a stout spine which is serrated behind. S^3

Z^2 Upper jaw notably longest. A^3

Z^2 Jaws about even or lower slightly projecting. I^3

A^3 Lower jaw 3-lobed, the middle lobe longest, resembling a projecting tongue; general color dusky. EXOGLOSSUM. 53.

A^3 Lower jaw not 3-lobed. B^3

B^3 Dorsal preceded by a short spine which is connected

by a membrane to the soft rays; snout short and blunt, in the males covered with tubercles in the breeding season. C³

B³ Dorsal without spine, the rudimentary rays in front united to the first developed ray. D³

C³ Lateral line incomplete; head broad, blackish in males. PIMEPHALES. 69.

C³ Lateral line complete. HYBORHYNCHUS. 68.

D³ Intermaxillaries not projectile; skin of lip and forehead continuous; snout long; scales quite small, 60 to 70 in the lateral line; males in spring with bright red band along sides which fades in summer to orange or white. RHINICHTHYS. 57.

D³ Jaws projectile; scales larger. E³

E³ Intestinal canal 8 times length of body, its numerous convolutions entirely surrounding the small air bladder; lips with cartilaginous sheaths; head rather long and narrow; cheeks more or less vertical; eye small, well back and high up; head and whole upper surface of males more or less covered with rather large tubercles in the spring; dorsal and anal with a blackish bar, which is then bordered with bright orange. CAMPOSTOMA. 70.

E³ Intestines not enveloping air bladder. F³.

F³ Suborbital bone, interopercle and base of the lower jaw much dilated, crossed by mucous cavities readily visible externally through the skin; small, silvery fishes. ERICYMBA. 54.

F³ Bones of head without such mucous cavities. G³.

G³ Jaws with sharp cutting edges; upper jaw heavy; intestines much convoluted, 4 times length of body; moderate-sized silvery species. HYBOGNATHUS. 67.

G³ Intestines scarcely longer than body. H³

H³ A minute, but distinct barbel at each angle of the mouth; silvery, a bluish or dusky band along side; head large, tuberculate in spring. CERATICHTHYS. 56.

H² No barbel; rather weak species of small size; silvery or with a plumbeous or dark band along side; head short, not tuberculate. HYBOPSIS. 65.

I³ Anal with 13 rays or more; much compressed; lateral line strongly decurved; silvery with bright reflections. STILBIUS. 62.

I³ Anal with 12 rays or less. J³.

J³ Lateral line incomplete or wanting. K³.

J³ Lateral line complete; (rarely interrupted on the last 5 or 6 scales.) M³.

K³ Scales rather large; lateral line less than 40; small dusky, Hybopsis-like species, HEMITREMIA. 66.

K³ Scales very small; lateral line 70 or more. L³.

L³ Sides with two longitudinal black bands, separated by a silvery interspace; which is crimson in the spring. CHROSOMUS. 59.

L³ Sides with a single band. PHOXINUS. 60

M³ Lateral line with 45 scales or more, males with tubercles in spring. N³.

M³ Lateral line with less than 45 scales. O³.

N³ Scales small; body elongated; compressed; mouth large, oblique; tubercles minute: sides crimson in spring. CLINOSTOMUS. 58.

N³ Scales larger, rather largest behind; tubercles rather large; no distinct crimson on sides or belly; usually a black spot at base of dorsal in front; largest of our native Dace. SEMOTILUS. 55.

O³ Scales large, loosely imbricated, the exposed portion much higher than long; body compressed, silvery, usually bluish above; males with small tubercles on the head in spring; fins in spring rosy or else pure satin-white. HYPSILEPIS. 60.

O³ Scales not specially higher than long; head not tuberculate (except in Ceratichthys.) P³

P³ Origin of dorsal distinctly behind ventrals; anal rather long; body slender and compressed, silvery.
ALBURNELLUS. 63.

P³ Dorsal not behind ventrals; anal rather short. Q³

Q³ Stout species with large heads which are convex and tuberculate in spring; mouth broad, horizontal; scales scarcely silvery. CERATICHTHYS. 56.

Q³ Weak or slender species, with small oblique mouths, and heads not tuberculate. R³

R³ Head short; lower jaw not projecting; sides silvery or more commonly with plumbeous or dark band.
HYBOPSIS. 65.

R³ Elongated; lower jaw slightly projecting; scales silvery. PHOTOGENIS. 64.

S³ Barbels 4; color olivaceous. CYPRINUS. 71.

S³ No barbels; color usually orange.
CARASSIUS. 72.

T³ Ventral fins present. AMBLYOPSIS. 29.

T³ No ventral fins. TYPHLICHTHYS.

U³ Body short; dorsal, anal and caudal distinct.
CHOLOGASTER.

U³ Body serpentiform; dorsal and anal uniting around the tail. ANGUILLA. 79.

V³ Snout much elongated, flattened; head somewhat scaly; jaws armed with strong teeth; size large, (2 to 6 feet long.) ESOX. 35.

V³ Head short, naked; body much compressed; tongue with sharp teeth; scales large, silvery; length 8 to 12 inches. HYODON. 43.

V³ Head moderate, scaly; teeth small; small fishes, (2 to 6 inches long.) W³

W³ Dorsal short, commencing behind the anal; a dark band along side, passing around snout; head flat on top; length about 2 inches. ZYGONECTES. 33.

W^3 Dorsal beginning in front of origin of anal. X^3

X^3 Pale, sides with several dark bars; intermaxillaries forming whole margin of upper jaw; lat. l., about 40.
FUNDULUS. 32.

X^3 Dusky; a broad dark bar at base of caudal; maxillaries forming most of margin of upper jaw; lateral line 35 or less. MELANURA. 34.

Y^3 Dorsal with 4 to 6 free spines in front.
APELTES. 26.

Y^3 Dorsal with 7 or more free spines.
PYGOSTEUS. 27.

Z^2 Mouth with true jaws provided with teeth; fins with rays; (scales present but very small). ANGUILLA. 79.

Z^3 Mouth round, without true jaws; fins without true rays; gill openings 7 rounded apertures in each side. F^4

A^4 Scales cycloid; dorsal many rayed; jaws moderate, with strong teeth; a broad buckler between branches of lower jaw; color dusky, males with a black spot bordered with orange at the base of tail. AMIA. 80.

A^4 Scales ganoid (*i e.*, diamond-shaped, bony enamelled plates;) dorsal few rayed. B^4

A^4 Scaleless or else with bony plates, five rows of which are larger than the others; dorsal short. D^4

B^4 Snout very long; much longer than the rest of head; olivaceous; more or less spotted. LEPIDOSTEUS. 81.

B^4 Snout not longer than rest of head. C^4

C^4 One row of large teeth in upper jaw; snout rather narrow; size moderate. CYLINDROSTEUS. 82.

C^4 Two rows of larger teeth in upper jaw; snout broad; size very large. ATRACTOSTEUS. 83.

D^4 Mouth broad; terminal; with many small teeth; snout forming a leaf-like blade. POLYODON. 84.

D⁴ Mouth small, inferior, toothless, with 4 barbels in front. E⁴

E⁴ Snout very broad, shovel-like.
SCAPHYRHYNCHUS. 86.

E⁴ Snout rather narrow, conic or pointed.
ACIPENSER. 85.

F⁴ Dorsal fins two, distinct; maxillary teeth with two cusp'. PETROMYZON. 87.

F⁴ Dorsal fin continuous; maxillary teeth tricuspid.
ICHTHYOMYZON.

NOTE.

In the list below is given under its appropriate family, the name of each genus, its author and the meaning of the appellation as well as the vernacular name by which the species are known thoughout the country. In most cases, I have indicated the recent synonymy. Thus, under *Roccus*, "> *Labrax Cuvier*," implies that Cuvier included the modern '*Roccus*" in his genus *Labrax* and the mark of inequality indicates that the extent of *Labrax* as understood by Cuvier, is greater than that of *Roccus* as at present understood.

The sign ot equality (=) indicates that the name following it is a synonym, *i e.*, another term for the same group.

Localities from which I have personally examined specimens are indicated by a *.

In most cases I have added the specific names of the leading species or the species most likely to be found in this State. In some large genera (*Ptychostomus*, *Amiurus* etc.,) a full list of species that may occur here could not well be given, as their distribution is very imperfectly known. In many other cases the name which our species should bear is uncertain as many forms described as distinct will on closer comparison be found to be identical with others already known.

Probably a third of the "species" described from our fresh waters are purely nominal. Thus our two species of black bass (*Micropterus*) have been described by more than eighteen different specific names, under more than nine different genera. A recent French author, August Dumeril, has very painfully sub-divided our *Amia calva* into upwards of a dozen "species." Prof. Gill has well said that the state of our knowledge concerning many groups of our fishes is a "disgrace to American Science."

Family I. PERCIDÆ. The Perches.

Body oblong, covered with ctenoid (rough edged) scales. Some or all of opercular bones serrated. Two dorsal fins, the first of stout spines, both well developed. Teeth on jaws and vomer; ventrals under pectorals. Carnivorous fishes, of moderate or large size, mostly in fresh water.

1. PERCA. *Linnæus.* Perches.

(Latin name, from a Greek word meaning "dusky.")

Common Perch, Yellow Perch.

L. Mich.* *P. flavescens.*

2. LUCIOPERCA. *Cuvier.* Pike Perches.

(Latin—Lucius, Pike, Perca, Perch.) = Stizostedion Rafinesque.

Pike Perch, (Books), Yellow Pike and Gray Pike, (Lakes), White Salmon and Black Salmon (Southern States). Dory (Green Bay). Wall-eyed Pike (Lakes). Glass Eye (Lakes). Okaw or Horned Fish (British America). Pickerel (L. Champlain), L. Mich.* Ohio R.* Wabash R.* *L. americana, ? L. grisea.*

3. ROCCUS. *Gill.* Striped Bass.

(Bad Latin for Rock Fish.) ◁ Labrax Cuvier.

White Bass. L. Mich.* *R. chrysops.*

4. MORONE. *Gill.* White Bass.

(Name unexplained.) ◁ Labrax Cuvier.

Short-Striped or Brassy Bass.

Lower Mississippi, (probably not in Indiana.) *M. interrupta.*

Family II. ETHEOSTOMIDÆ. The Darters.

Small fishes of the fresh waters of eastern North America, not found elsewhere, like the Percidæ in most respects, but of much smaller size, and the fins proportionally much larger. The pectoral fins are especially developed, and the jerky swimming of these fishes is accomplished by them, and not as in others by the use of the caudal. These little fishes remain motionless on the bottom unless disturbed, when they dart quickly up stream for a short distance. They may be best caught by dragging the net with the current, (Baird.) Many of them are brilliantly colored.

In the original diagnosis of this group, by Professor Agassiz, (Lake Superior. p. 298,) one of the distinctive characters given is "no air bladder." This statement has been generally copied. Dr. Gunther (Catalogue of fishes, Vol. 1, p. 51,) remarks that the air bladder present in other Percidæ is "in *Pileoma* (*Percina*) and *Boleosoma* absent." In several specimens of *Percina caprodes* which I have receutly examined, I find the air bladder present and of the same form as in *Perca*, *Pomotis* and allied genera, *i. e.* adherent to the walls of the abdominal cavity so that it cannot be taken out whole. In all our Percoid fishes (excepting Lucioperca and possibly others) it appears like a membrane stretched from one side of the cavity to the other above the intestines. In all, especially when punctured or shrunken in spirits, it is very inconspicuous, and it is as obvious in *Percina* as in specimens before me of *Amblopliles* of the same size. Hence the absence of the air bladder cannot distinguish Etheostomoids from Percoids. In fact there is no reason except convenience for keeping the two groups apart.

5. PERCINA. *Haldeman.* Barred Darters.

(Latin—little Perch.) =Pileoma Dekay.

Hog Fish. Johnny. Jack Pike.

L. Mich.,* White R.,* Ohio R.,* etc. *P. caprodes.*

6. ETHEOSTOMA. *Rafinesque.* Black-sided Darters.

(Greek—strainer mouth.) =Diplesion Ord.

Ohio R.,* White R.,* L. Michigan*, *E. blennioides.*

7. BOLEOSOMA. *DeKay.* Tesselated Darters.

(Greek—dart-body).

⊱ Cottogaster, Putnam.
?⊱ Nanostoma, Putnam MSS.
⊱ Arlina & Estrella, Grd.
?⊱ Boleichthys, Girard.
⊱ Hadropterus, Agassiz.

Little Johnnies (Ind.) Tessellated Darter (books), Variegated Darter.

L. Mich.* White R.* Ohio R.,* etc. *B. olmstedi.* *B. variatum.*

8. HYOSTOMA. *Agassiz.* Hog-fish.

(Greek—hog-mouth.)

Eastern and southern streams. I have seen none in this region.

9. ASTATICHTHYS. *Le Vaillant.* Variegated Darters.

(Greek—a fish which never stands still).

= Pœcilosoma, Ag. (preoccupied).
= Pœcilichthys, Ag. (but the original type of *Pœcilichthys* (*Eth. variatum* Kirt.) seems to belong to *Boleosoma*. Hence it becomes necessary to adopt the above name lately proposed by LeVaillant.)

Blue Darter. Blue and Orange Darter. Red bellied Johnny.

White R.* Ohio R.* etc. *A cœruleus* and perhaps others.

10. CATONOTUS. *Agassiz.* Low-backed Darters.

(Greek—low back; low dorsal fin). ▷ Nothonotus, Ag.

L. Mich.* Upper Ohio (Cope) S. Ills. (Putnam). *C. lieolatus. C. flabellatus. C. maculatus.*

11. HOLOLEPIS. *Agassiz.* Little Darters.

(Greek—solid-scale)

L. Mich.* *? H. erochrous.*

12. PLEUROLEPIS. *Agassiz.* Slim Darters.

(Greek—scaly side.)

White R.* Upper Ohio (Cope). *P pellucidus.*

13. MICROPERCA. *Putnam.* Least Darters.

(Greek—small Perch.)

Mich., Wis., Ills. and Ala., (Putnam,) Rock R. Wis.* (Bundy, Struthers). *M. punctulata.*

Family III. ICHTHELIDÆ. The Sun Fishes.

Fresh water fishes, chiefly North American, resembling the Percidæ, but having, mostly, but a single dorsal, and the body usually deeper, and the scales and opercles smoother than in the Percidæ.

14. MICROPTERUS. *Lacepede.* Black Bass.

(Greek—small-fin.) (Huro and Grystes Cuvier,)
(X Centrarchus Cuvier.)
(X Calliurus Raf.)

Large-mouthed Black Bass, Moss Bass, Oswego Bass, Small-mouthed Black Bass, Green Bass.

L. Mich.,* White R.,* Wabash R.,* Ohio R.* (*M. nigricans. M. salmoides.*)

15. CHÆNOBRYTTUS. *Gill.* Wide-mouthed Sun-fish.

(Greek—gaping Sun-fish.) = Calliurus Ag. but not of Raf.

Southern and Western streams. I have seen none from this region.

15(2) MESOGONISTIUS. *Gill.* Barred Sun-fish.

(Greek—middle, angle, sail, *i. e.*, dorsal angled in the middle?) Bryttus and Pomotis of authors.

Dr. Levette informs me that he saw, some years ago, in an aquarium in the southern part of this State, several specimens of a sun-fish, sharply barred with black, after the manner of the salt water *Chætodon*. These fishes were said to have come from a neighboring stream, but the only sun-fish with such markings which is known to me (*Mesogonistius chaetodon* (Baird Gill,) has not, I believe, hitherto been noticed outside of New Jersey.

16. POMOTIS. *Cuvier.* Short-eared Sun-fishes.

(Greek—eared opercle.)

Common Sun-fish, Pond Fish, Sunny, Bream, Ruff Kiver, Pumpkin Seed.

L. Mich.,* White R.,* *P. aureus.*

17. ICHTHELIS. *Rafinesque.* Long-eared Sun-fish.

(Greek—Sun-fish.) = Lepomis, Rafinesque, which name should probably [be adopted.

Sun-fish,* Red Eyes, Eared Pond Fish, etc.

L. Mich.,* White R.,* Ohio R.,* Wabash R.* *? I. auritus, I. nitidus, I. macrochira, I. notatus, etc.*

18. AMPLOPLITES. *Rafinesque.* Rock Bass.

(Greek—blunt-armed.) ◁ Centrarchus Cuvier.

L. Mich.,* Ohio R.,* White R.,* etc.

Rock Bass, Goggle Eye, Red Eye, *A. rupestris.*

19. HYPERISTIUS. *Gill,* Bar Fish.

(Greek—high sail = dorsal fin.) ◁ Pomoxis. Agassiz.

Bar Fish, 6-Spined Bass.

L. Mich.,* Ohio R.,* *H. hexacanthus.*

20. POMOXYS. *Rafinesque.* Crappies.

(Greek—sharp opercle.)

Crappie.

White R.,* and all Western rivers (fishermen). *P. storerius.*

20(2) CENTRARCHUS. *Cuvier.* Many-spined Bass.
(Greek—anal spined.)
Southern, probably not in Indiana. *C. irideus.*

Family IV. SCIÆNIDÆ. The Drum-Fishes.

Mostly salt water fishes, resembling the Percidæ but having the vomer toothless and the bones of the head traversed by mucous cavities. The air bladder is usually much larger than in the Percidæ.

21. HAPLOIDONOTUS. *Rafinesque.* River Sheepshead.
(Greek—simple-back). = Amblodon Raf.
Sheepshead. Grunting Perch. River Drum. White Perch. (Ohio R.) Corbeau (Frenchmen). Campbellite (Posey Co.) White Fish (Potomac).
Great Lakes* (a coarse and worthless fish). Ohio R.* (eaten for food but rather tasteless). Wabash R.* White R.* *H. grunniens.*

Family V. COTTIDÆ. The Sculpins.

Mostly salt water fishes, remarkable for the form of the suborbital bone, which extends backwards over the cheeks, joining with the preopercle. Head always very large and more or less spinous. Mouth wide; eyes usually close together near the top of the head. Ours are scaleless.

22. URANIDEA. *DeKay.* Miller's Thumbs.
(Greek—Star Gazer). ◁ Cottus Girard.
Miller's Thumb (Europe). Jack Fish (Maryland). Upper Ohio.* Wis.* (Bundy). Undoubtedly in Indiana but I have not yet met with any species.

23. POTAMOCOTTUS. *Gill.* River Sculpins.
(Greek—River Sculpin.) ◁Uranidea.
Big Miller's Thumb—Caves in Southern part of Indiana.* Ohio, (Girard).

24. TRIGLOPSIS. *Girard.* Lake Sculpins.
(Greek—Gurnard-like). =Ptyonotus Gunther.
Deep water, Lake Michigan, (Dr. Hoy,) known chiefly from remains in stomach of Trout and Ling. *P. thompsoni.*

Family VI. GOBIIDÆ. The Gobies.

General appearance something like the Cottidæ but with the head smaller and smoother and the spines in the dorsal fin much weaker. In many species the ventral fins are united. Chiefly in salt water and of small size.

25. GOBIOSOMA. *Girard.* Naked Gobies.

(Greek—Goby-body.)

Texas.—A specimen taken in the Ohio river near Louisville, is in the Agassiz Museum. (Putnam.) *G. molestum.*

Family VII. GASTEROSTEIDÆ. The Sticklebacks.

Small fishes in salt or fresh waters, either naked or covered with bony plates. Dorsal spines free; ventrals of a single spine each. Voracious little fishes, remarkable for their nest-building habits. The male in the breeding season is very much darker than the female and somewhat different in form.

26. APELTES. *Dekay.* Smooth Sticklebacks.

(Greek—without shields.) ◁Gasterosteus Cuvier.

Brook Stickleback. Ohio Stickleback. Burnstickle. About Lake Erie.* Throughout Wis.* N. Ind. (undoubtedly.) *A. inconstans.*

27. PYGOSTEUS. *Brevoort.* Many spined Sticklebacks.

(Greek—bony rump.) ◁Gasterosteus. Cuvier.

L. Superior, (Agassiz,). Near Racine, in L. Mich. (Dr. Hoy.) *P. nebulosus.*

Family VIII. ATHERINIDÆ. The Silversides.

Elongated fishes of small size, mostly of salt water. Two dorsal fins, the first of which is short and of a few weak spines; sides always with a bright silvery band by which the family can be at once recognized.

28. LABIDESTHES. *Cope.* Brook Silversides.

(Greek—lip eater.)

Jumping Jack, Silver Sides, Silver Darter. White R.* Fall Creek.* Ohio R.* L. Erie.* L. Mich. (Milner.) *L. sicculus.*

Family IX. AMBLYOPSIDÆ. The Cave Fishes.

Small fishes allied to the Cyprinodonts, but with the vent at the throat. Genera 29 and 30 are blind and 30 and 31 are without ventral fins; 4 species are known, 3 from our Western Caves and one (*Chologaster cornutus*) from the rice ditches of South Carolina.

29. AMBLYOPSIS. *DeKay.* Larger Blind Fish.
(Greek—blunt-vision).

Wyandot Cave.* Mammoth Cave* and various other caves in Southern Indiana and Kentucky. *A. spelæus.*

30. TYPHLICHTHYS. *Girard.* Small Blind Fish.
(Greek—Blind Fish).

Wyandot Cave.* Mammoth Cave (Girard) (Putnam). *T. subterraneus.*

31. CHOLOGASTER. *Agassiz.* Ditch Fishes.
(Greek—bile stomach).

Mammoth Cave (Putnam). Well in Tenn. (Putnam) not yet seen in Indiana. *C. agassizii.*

Family X. CYPRINODONTIDÆ. The Killifishes.

Small fishes of fresh or brackish waters; dorsal single, well back; head scaly, flat on top; mouth with teeth; females usually different from the males and of larger size.

32. FUNDULUS. *Lacepede.* Killifishes.
(Latin—bottom fish.)

Killifish, Mummichog, Barred Minnow, Toothed Minnow.

Tributaries Rock river, S. Wis.* Detroit river, (Cope.) Brackish water fishes, but ascending far up the rivers, doubtful whether found in Indiana. *F. multifasciatus* (Var.?)

33. ZYGONECTES. *Agassiz.* Toothed Minnows.
(Greek—Yoke Swimmers.) ⊢ Haplochilus, McClelland.

White river.* Ohio river.* *Z. pulchellus.*

Family XI. UMBRIDÆ. The Mud Minnows.

Small fresh water fishes, allied to the Cyprinodonts, but with the mouth entirely different in its structure. But two species are known, one in Austria, and the other in our brooks and ditches, in mud or weeds.

34. MELANURA. *Agassiz.* Mud Minnows.
(Greek—black-tail.) ◁ Umbra Gunther.

Mud Minnow, Black-tailed Dace. Everywhere in S. Wis.,* etc., in company with the Stickleback, but I have as yet seen neither in Indiana. *M. limi.*

Family XII. ESOCIDÆ. The Pikes.

Fresh water fishes, chiefly American, of rather large size, with elongated bodies, broad depressed snouts, strong teeth and small scales. Dorsal far back, opposite anal.

35. ESOX. *Linnœus.* Pickerels.
(Latin—a pike).

Muskallunge, Pike, Pickerel, Green Pickerel, Black Pickerel, etc.
Lake Michigan.* White R.* Ohio R. (Fishermen) and every stream of importance in the State. *E. nobilior, E. estor, E. americanus.* Several others perhaps identical with the one here called *americanus* are mentioned by Cuvier, Kirtland, Cope and others.

Family XIII. SALMONIDÆ. The Trout.

Chiefly fresh water fishes, various in appearance and habits, but all having an adipose dorsal fin behind the rayed dorsal. The variations according to sex, season and waters are very great in these fishes.

36. SALMO. *Linnœus.* Salmons.
(Latin—a Salmon). ▷ Hucho, Trutta, Fario, Salar, etc., authors.

Lake Salmon, Mackinaw Trout or Namaycush, Siscowet, Brook Trout or Speckled Trout.
Lake Michigan.* I have seen no Brook Trout from this State. *S. namaycush, S. siscowet, S. fontinalis.*

37. THYMALLUS. *Cuvier.* Graylings.
(Latin—a Grayling.)

Lakes in northern part of S. peninsula of Mich. *T. tricolor.*

38. COREGONUS. *Cuvier.* White Fish.
(Greek—angled head.)

White Fish of the Lakes, Laveret.
L. Mich.* *C. albus.*

39. ARGYROSOMUS. *Agassiz.* Siscoes.
(Greek—silvery-body.) ◁Coregonus Cuvier.

1, Lake Herring, Michigan Herring; 2, Sisco; 3, Moon Eye; 4, Black Fin.

L. Mich.,* L. Tippecanoe,* etc., in Kosciusko co., Ind., Lakes in S. Wis.,* Lakes in W. Mich.*

A. clupeiformis. A. sisco. A. hoyi. A. nigripennis.

Family XIV. PERCOPSIDÆ. The Trout Perches.

Small fresh water fishes, allied to the Salmons, but with the mouth and scales decidedly perch-like. But one species of this curious family is definitely known, although another has been noted from Kansas.

40. PERCOPSIS. *Agassiz.* Trout Perches.
(Greek—Perch like.)

L. Superior, (Ag.) L. Mich.,* Ohio R.,* (a single specimen in Dr. Sloan's collection. *P. guttatus.*)

Family XV. CLUPEIDÆ. The Herrings.

Chiefly salt water fishes, various in habits and appearance, but mostly with rather large, silvery scales. Our species may be known by the form of the abdomen, which is compressed to an edge and serrated.

41. ALOSA. *Cuvier.* Shads.
(German—Alse, English—Allis, a Shad.) = Pomolobus Raf.

Ohio Shad, Skip Jack, Ohio Herring.

Ohio R.* *A. chrysochloris.* (The Sea Shad, *A. sapidissima,* has also been introduced into Western streams.)

42. DOROSOMA. *Rafinesque.* Hickory Shads.
(Greek—lance Body.) ◁ Chatoessus. Cuvier.)

Hickory Shad, Gizzard Shad, Thread Shad, Winter Shad.

Ohio R.* *D. notatum,* (same as Eastern *D. cepedianum?*)

Family XVI. HYODONTIDÆ. The Moon Eyes.

American fresh water fishes, compressed and brilliantly silvery, resembling the Shads in many respects, but with stronger teeth on the tongue, etc. But one species is known.

43. HYODON. *LeSueur.* Moon Eye.
(Greek—hog tooth, or curved tooth?)

Moon Eye, Silver Bass, Toothed Herring.
L. Mich.,* Ohio R.,* *H. tergisus.*

Family XVII. CATOSTOMIDÆ. The Suckers.

Fresh water fishes of North America, distinguished by the toothless protractile jaws, which are surrounded by fleshy lips; pharyngeal teeth, numerous and small; scales rather large.

44. CATOSTOMUS. *LeSueur.* White Suckers.
(Greek—low Mouth.)

Common Sucker, Boston Sucker, White Sucker:
Ohio R.,* L. Mich.,* White R.,* Wabash R.,* etc.
C. teres.

45. HYLOMYZON. *Agassiz.* Mud Suckers.
(Greek—Mud Sucker). ◁ Catostomus LeSueur.

Mud Sucker, Black Sucker, Big Stone Roller, Shoemaker. L. Mich.* Ohio R.* White R.* *H. nigricans.*

46. PTYCHOSTOMUS. *Agassiz.* Red Horses.
(Greek—folded-mouth).

Red Horse, Mullet, Striped Sucker, White Sucker, etc. L. Mich.* Wabash R.* White R.* Ohio R.* and every other river in the West. *P. erythrurus*, *P. carpio, P. maerolepidotus* and many others.

47. PLACOPHARYNX. *Cope.* Few Toothed Mullet.
(Greek —— throat).

Wabash R. (Cope). *P. carinatus.*

48. MOXOSTOMA. *Rafinesque.* Chub Suckers.
(Greek—Sucker mouth).

Chub Sucker, White-nosed Sucker, Creek Fish, (Wis).
L. Mich.* Ohio R.* Wabash R.* WhiteR.* *M. oblongum* and others (if there are any others).

49. CARPIODES. *Rafinesque.* Carp Suckers.
(Greek—Carp-like).

Carp Sucker, Spear Fish, High Backed Buffalo, Carp.
L. Mich.* White R*. Wabash R.* OhioR*. *C. cyprinus*, *C. velifer* and others.

50. ICHTHYOBUS. *Rafinesque.* Straight-backed Buffaloes.
(Greek—Bull-fish).

Buffalo Fish. Buffalo Perch.
Wabash R.* Ohio R. (Agassiz.) *I. bubalus.*

51. BUBALICHTHYS. *Agassiz.* Buffalo Fishes,
(Greek—Buffalo Fishes.)

Common Buffalo Fish. Large and small-mouthed Buffalo.
Ohio R.* *B. bubalus?* *B. niger?* *B. urus?*
(The species are uncertain.)

52. CYCLEPTUS. *Rafinesque.* Long Buffaloes.
(Greek—slender circle.)

Missouri Sucker. Black Sucker. Long Buffalo. Ohio R. (Authors.)
C. elongatus.

Family XVIII. CYPRINIDÆ. The Carps.

Small fishes found in the fresh waters of nearly every part of the globe. Mouth toothless, usually without fleshy lips and with the pharyngeal teeth few and proportionally large. No group in all the range of Zoology is more puzzling than this and in none is it more difficult to distinguish species. The following genera seem well characterized but they shade closely one into another. The spring or breeding dress of many species is peculiar.

53. EXOGLOSSUM. *Rafinesque.* Stone Toters.
(Greek—tongue outside.)

Stone Toter. Nigger Chub. Day Chub. Cut-lips.
Susquehanna R.* Headwaters of Ohio R. (Gunther), probably not in Indiana.
E. maxillingua.

54. ERICYMBA. *Cope.* Silver Chubs.
(Greek—truly a cup, in allusion to the mucous cavities?)

Hurricane Creek, Johnson Co.* White R. (W. P. Clark). *E. buccata.*

55. SEMOTILUS. *Rafinesque.* Chubs.
(Name unexplained.) = Leucosomus, Hæckel.

Common Chub, Horned Chub, Horned Dace, Fall Fish. Ohio R.* L. Mich.* White R.* *S. corporalis, ?* *S. rhotheus.*

56. CERATICHTHYS. *Baird.* Horned Chubs.
(Greek—horned fish).

Horned Chub, Horned Dace, Minnows, Spotted Shiner. Ohio R.* White R.* L. Mich.* *C. biguttatus, C. dissimilis, C. stigmaticus, C. hyalinus,* and probably others.

57. RHINICHTHYS. *Agassiz.* Black-nosed Dace.
(Greek—snout-fish). = Argyreus, Hæckel.

Black-nosed Dace, Long-nosed Minnow, Red-sided Minnow.

Ohio R.* L. Mich.* White R.* *R. lunatus, R. atronasus, R. nasutus,* etc.

58. CLINOSTOMUS. *Girard.* Rosy Dace.
(Greek—inclined mouth.)

Blue Minnow, Red-bellied Shiner of the Lake.

L. Mich.* *C. elongatus* and probably others.

59. CHROSOMUS. *Rafinesque.* Red Minnows.
(Greek—colored-body).

Red-bellied Minnow, Red Minnow, Striped Minnow, Soldier Fish.

L. Mich.* White R.* Wabash R.* Ohio R.* *C. erythrogaster.*

60. PHOXINUS. *Cope.* True Minnows.
(Greek—a Minnow, from a word meaning tapering.)

L. Mich., (Cope), not known from Indiana. *P. neogæus.*

61. HYPSILEPIS. *Baird.* Fall Fishes.
(Greek—high scale.) = Plargyrus Girard.

Red Fin, Horned Shiner, Fall Fish, White Shiner, Silver Fins, White Dace, Blue Shiners, Horned Minnows. *H. cornutus, H. kentuckiensis, H. diplœmia,* and perhaps others, in every permanent stream throughout the West.

62. STILBIUS. *Gill.* Shiners.
(Greek—shining.)
= Stibe Dekay, (used in Botany.)
⊳ Abramis Gunther.
X Luxilus Raf.

Common Shiner. Bream.
White R.,* L. Mich.* *S. americanus.*

63. ALBURNELLUS. *Girard.* Bleaklings.
(Latin—a little Bleak, a European Minnow.) ⊲ Leuciscus. Gunther.

Silvery Minnows, Red-faced Minnows.
Ohio R., (Sloan), L. Mich.,* St. Joseph's R., (Cope), *A, rubellus, A. rubrifrons, A. arge, A. jaculus,* etc.

64. PHOTOGENIS. *Cope.* White-faced Minnows.
(Greek—light or white.)

Head waters of Ohio R., (Cope.) *P. leucops,* etc.

65. HYBOPSIS. *Agassiz.* Blunt-nosed Minnows.
(Greek—blunt-faced.)

Little Minnows, Minnies, Black-sided Minnows, *H. storerianus, H. tuditanus, H. hæmaturus, H. plumbeolus, H. stramineus,* etc.

66. HEMITREMIA. *Cope.* Minnows.
(Greek—half aperture (lateral line running half-way?)

L. Michigan,* (Cope.) *H. heterodon.*

67. HYBOGNATHUS. *Agassiz.* Blunt-jawed Minnows.
(Greek—blunt-jaw.)

White river,* Ohio river,* Wabash river.* (Cope.) *H. argyritis, H. nuchalis.*

68. HYBORHYNCHUS. *Agassiz.* Prickly-nosed Minnows.
(Greek—blunt-snout.)

Lake Michigan,* Ohio river.* *A. notatus.*

69. PIMEPHALES. *Rafinesque.* Fat-headed Minnow.
(Greek—fat-head.)

Fat-head, Black-head. Southern Indiana. (Cope.) Ohio river. (Agassiz.) *P. promelas, P. agassizii.*

70. CAMPOSTOMA. *Agassiz.* Stone Rollers.
(Greek—curved (?) mouth.)

White river,* Ohio river.* *C. dubium* and others (if there are any others.)

71. CYPRINUS. *Linnæus.* European Carps.
(Greek—a Carp.)

Carp. European Carp. (Introduced into some eastern streams.) *C. carpio.*

72. CARASSIUS. *Nilsson.* Crucian Carps.
(Latin name.)

Gold Fish.
Introduced into many eastern streams and commonly domesticated. *C. auratus.*

Family XIX. SILURIDÆ. The Cat Fishes.

Fishes, chiefly fresh water, scaleless, naked or with bony plates; mouth with long barbels; dorsal and pectorals usually each with a short spine which has a complicated movement. Adipose fin usually present.

73. ICTALURUS. *Rafinesque.* Channel Cats.
(Greek—Cat Fish.)

Channel Cats, Fork-tail Cats, Blue Cats, Silver Cats.
L. Michigan,* Ohio river,* Wabash river.* *I. cœrulescens* and possibly others.

74. AMIURUS. *Rafinesque.* Horned Pouts.
(Greek—without notch, *i. e.*, tail not forked.) ◁ Pimelodus Lacepede.)

Horned Pouts, Bull-heads, Yellow Cats, Black Cats, Little Cats, Ministers, etc., etc.
Every stream east of Rocky Mountains. *A. nebulosus*, *A. nigricans*, etc., etc., species uncertain.

75. NOTURUS. *Rafinesque.* Stone Cats.
(Greek—back-tail.)

White river,* Ohio river.*
N. flavus and possibly others.

76. HOPLADELUS. *Rafinesque.* Mud Cats.
(Greek—visibly armed.)

Southern States, perhaps in Indiana, but I have not seen it. *H. olivaris, H. limosus.*

77. GRONIAS. *Cope.* Blind Cats.
(Greek.—a Cavern.)

Cave in southeastern Pennsylvania, probably not in Indiana. *G. nigrilabris.*

Family XX. GADIDÆ. The Cod Fishes.

Chiefly salt water fishes, with the dorsal and anal fins very long, or divided into 2 or 3 fins each; ventral fins under the throat scales, usually small.

78. LOTA. *Cuvier.* Lings.
(Latin—a Ling).

Ling, Burbot, Lawyer, Methy, Eel Pout, Barbel.
L. Mich.* Ohio R. very rare (Dr. Sloan). *L. maculosa.*

Family XXI. ANGUILLIDÆ. The Eels.

Fishes of all waters, with the body serpentiform, the scales very minute and teh dorsal and anal fins meeting around the tail. Ventral fins wanting.

79. ANGUILLA. *Thunberg.* Eels.
(Latin—an Eel).

Yellow Eel, Ohio Eel, Common Eel(?)
Ohio R. (Kirtland, Sloan). Not found in the Lakes till the opening of the canals. (Sloan). *A. bostoniensis* (?) (*A. flava*, Raf.)

Family XXII. AMIADÆ. The Amias.

Large fishes of the fresh waters of the U. S. Scales large, cycloid; jaws moderate, strong; teeth stout; dorsal fin very long; anal fin moderate. But a single species known, having no near relatives among living fishes, but allied to some fossil species. The males are smaller and have a bright black tail spot.

80. AMIA. *Linnæus.* Bow Fins.
(Latin—a Bonito, or some other sea fish.)

Dog Fish, Mud Fish, Marsh Fish, Poisson de Marais, Bow-fin, Lawyer, (so called because "it will bite at anything, and is good for nothing when caught.")
Said to occur in all the larger streams. L. Mich.* *A. calva.*

Family XXIII. LEPIDOSTEIDÆ. Gar Pikes.

Scales ganoid, rhombic, bony and enamelled; dorsal fin short, air bladder as in Amia, lung-like; general structure almost as reptilian as fish-like. Fresh waters of the warmer parts of North America; closely related to fossil forms long extinct.

81. LEPIDOSTEUS. *Lacepede.* Long-nosed Gar Pikes.

(Greek—bony scale.)

Gar Pike, Bony Pike, Bony Gar, Bill Fish, Buffalo Pike, Sword Fish, Snake Fish, Land Shark, Serpent Fish.

Ohio R.,* L. Mich.* Occurs in all the larger Western streams. More than 20 species are described, but I can recognize but one. *L. osseus.*

82. CYLINDROSTEUS. *Rafinesque.* Short-nosed Gar Pikes.

(Greek—bony cylinder.)

Short-nosed Gar Pike, Duck-billed Gar Pike.

L. Mich.,* Ohio R., (Agassiz). *C. platystomus.*

83. ATRACTOSTEUS. *Rafinesque.* Alligator Gars.

(Greek—bony dart.)

Alligator Gar, Great Gar Pike.

Lower Mississippi,* Ohio R., (Rafinesque.) *A. ferox.*

Family XXXIV. POLYODONTIDÆ. The Spoon Bill Sturgeons.

Scaleless; snout prolonged into a thin blade; mouth wide, with many small teeth. Fresh waters of North America and China.

84. POLYODON. *Lacepede.* Spoon Bill Sturgeon.

(Greek—many teeth.)

Spoon Bill Sturgeon, Duck Bill Sturgeon, Duck Bill Cat.

Wabash R. (Fishermen.,) Ohio R.,* White R.* *P. folium.*

Family XXV. ACIPENSERIDÆ. The Sturgeons.

Fishes chiefly of the fresh waters of northern regions; skin more or less covered with bony plates; mouth beneath the long snout, preceded by four barbels.

85. ACIPENSER. *Linnœus.* Sturgeon.

(Latin—Sturgeon—Sharp-fin.)

Lake Sturgeon, Red Sturgeon, Black Sturgeon, River Sturgeon, Rock Sturgeon, etc.

L. Mich.,* Ohio R.,* *A. rubicundus, A. maculosus.*

83. SCAPHYRHYNCHUS. *Hœckel.* Shovel Nosed Sturgeon.

(Greek—skiff snout.)

Shovel-Nosed Sturgeon, Broad-Nosed Sturgeon.

Ohio R.,* *S. platyrhynchus.*

Family XXVI. PETROMYZONTIDÆ. The Lampreys.

Scaleless fishes with no pectoral or ventral fins, and with several round apertures or gills. Skeleton cartilaginous; mouth destitute of jaws; eel-like fishes of fresh and salt waters, attaching themselves by their sucker-like mouths to various bodies on which they feed by means of their rasp-like teeth.

These fishes undergo a metamorphosis, the young having the eyes rudimentary and the teeth different.

87. PETROMYZON. *Linnœus,* Lampreys.

(Greek—stone sucker.) ⊳ Ammocœtes Dumeril. (Larval forms.)

Lampreys, Lamper eels, Black Lamprey.

L. Mich.,* Ohio R.,* *? P. fluviatilis* and others.

88. ICTHYOMYZON. *Girard.* Lampreys.

(Greek—Fish Sucker.) ⊲ Petromyzon L.
⊳ Scolecosom a Girard. (Larval forms.)

Lamper Eels, Lampreys, Silver Lamprey.

L. Erie,* Ohio R.,* *I. argenteus* and others.