

No. V.

The FISHES OF NEW-YORK, described and arranged. By SAMUEL L. MITCHILL, M. D. Professor of Natural History in the University of New-York, one of the Corresponding Secretaries of the Literary and Philosophical Society, &c.

[Read before the Society 8th of December, 1814.]

IN the present arrangement I have distributed the fishes into five orders; to wit, **APODAL**, when they are destitute of ventral fins; **JUGULAR**, when these are situated on the neck; **THORACIC**, when they grow on the breast; **ABDOMINAL**, when they arise from the belly.

These four orders comprehend the fishes that have bones.

The cartilaginous fishes, which have been divided by several very able zoölogists into two orders, the *chondropterygious*, or those which have leathery fins, and the *branchiostegious*, or such as have concealed gills, are here included in a single order of **CARTILAGINOUS**; making the fifth division of the class.

The fishes of New-York, as far as they have come to my knowledge, may be exhibited in the following table :

Section I. Bony Fishes.

APODAL.

Anguilla, eel,

2 species, with their varieties.

Muraena,

1

Ophidium,	2
Ammodytes, lance,	1
Trichiurus, hair tail,	1
Stromateus, harvest fish,	2

9 species.

JUGULAR.

Gadus, cod,	10 species, with their varieties.
Blenny,	3

13 species.

THORACIC.

Echeneis, remora,	2 species.
Coryphæna, or sailor's dolphin,	1
Goby,	1
Cottus, bullhead,	3
Scorpena,	1
Zeus, dory,	3
Pleuronectes, flounder,	7 with their varieties.
Sparus, sheep's head,	1
Labrus, porgy, weakfish, tautog, and others,	10
Sciaenops, drums,	3
Perca, rockfish, sea bass,	2
Bodian, white, black, and yellow perch, &c.	7
Scomber, mackerel,	7
Gasterosteus, stickle back,	2
Trigla, gurnard,	2

52 species.

Silure, catfish,	2
Salmo, trout, salmon, smelt,	3
Fistularia, pipe fish,	2
Esox, pike,	9
Elops,	1
Exocoetus, flying fish,	3
Polyneme,	1
Atherine, silver side,	3
Mullet,	1
Clupea, herring,	13
Cyprinus, carp,	4

42

Making of bony fishes, 116 species.

Section II. Cartilaginous Fishes.

FIFTH ORDER.

Petromyzon, lamprey,	1
Accipenser, sturgeon,	2
Lophius, angler,	2
Balistes, filefish,	3
Diodon,	2
Cephalus, head fish,	1
Tetraodon,	3
Syngnathus, sea horse,	2
Raja, skate, sting ray, &c.	5
Squalus, shark, dog fish,	8
Cyclopterus, humpsucker,	1
Pegasus,	1

Making of cartilaginous fishes, 31 species.

The species thus are :

Bony fishes,	116
Cartilaginous,	31
	<hr/> 147

Amounting to one hundred and forty-seven species of fishes embraced in my memoir.

To these I add some memorable varieties, which present themselves to the eye of every observer, and ought to be noticed by the naturalist. Among the more distinguishable forms of these are,

Of the Common Cod, or dorse,	2 varieties.
Tomcod,	5
Flounder,	2
Tautog,	3
Bergall,	1
Weakfish,	1
Rock fish,	2
Pike gudgeon,	3
	<hr/> 19 varieties.

Amounting to nineteen well-defined varieties of the New-York fishes.

The enumeration now stands thus :

Species of New-York fishes,	147
Varieties of the same,	19
	<hr/>
Species and varieties,	166

I have had before me, during my inquiries, the Leyden copy of the *Museum Ichthyologicum*, by L. T. GRONOVIVS, 1754, fol. ; CASTEL'S French edition of BLOCH'S *Histoire Naturelle des Poissons*, Paris, 10 tom. 12mo. 1801 ; GMELIN'S edition of LINNE'S *Systema Naturæ*, with TUR-

TON's English translation; and the *ichthyological part* of SHAW's *General Zoology*, as published in London.

From the latter of these works I have copied the generic characters which illustrate the species that I have described.

I need scarcely mention, that the splendid works of CATESBY and EDWARDS have been constantly at my elbow.

I feel a peculiar pleasure in stating my obligations to the labours of my assiduous and excellent friends, SAMUEL AKERLY and SAMUEL G. MOTT, of the city of New-York, physicians. The former of these gentlemen drew from nature most of the figures which accompany this memoir; and the latter, by his activity and vigilance, detected many of the individuals, which, without his aid, might not have come to my knowledge. I owe them much for the drawings and specimens with which they have supplied me. Science will never cease to respect them both.

TO JAMES INDERWICK, Esq. I also am indebted for several graphical representations. To his skill in delineation, and to his cultivated mind, I am highly gratified in bearing testimony.

NEW-YORK FISHES.

Order, APODES.

ANGUILLA. EEL.

Character.

Head smooth. Nostrils tubular. Eyes covered by the common skin. Gill membrane, ten rayed. Body roundish, smooth, mucous. Dorsal, caudal, and anal fins united. Spiracles behind the head or pectoral fins.

1. *Common eel.* (*Anguilla vulgaris.*) Olive brown eel, subargenteous beneath, with the lower jaw longer than the upper.

Agrees in the main with the common eel of the books, though there seems to be some variety in the number of the rays in his fins. He is sometimes brown on the back, and yellow on the belly; and occasionally black above, and dusky below. Has been known to weigh twelve pounds and a half, as taken in the bay of New-York. The largest one I have heard of was caught in one of the south bays of Long-Island, and weighed sixteen pounds and a half.

The eel is brought to the New-York market at all seasons of the year. In the summer he is taken in nets, and in baskets made of wooden splinters, called *eel-pots*. He is also taken by the hook; and in summer evenings by a bunch of tough bait, after a manner called *bobbing*. In the winter eels lie concealed in the mud, and are taken in great numbers by spears. It is a common custom in New-York for the fishmongers to skin them; and vast quantities of eels are disposed of in that way.

The roes or ovaria of eels may be seen, by those who will look for them in the proper season, like those of other fish. By inattentive observers they may be mistaken for masses of fat. For some curious facts on the production of eels in the New-York waters, the *Medical Repository* may be consulted, vol. 10th, p. 201—203.

2. *Conger eel.* (*Anguilla conger.*) Dark brown, whitish below, and a lateral line dotted with white.

I examined a living one on the 7th July, 1814, which was thirty-seven inches in length, seven and a half in girth, and weighed three pounds and eleven ounces. Flesh white, and very dainty eating. Colour of the back and sides, a very dark brown; sometimes lighter on and near the fins, of which those on the back and belly are tipped or margined with black. Lateral line distinct, and noted by a row of

white dots. Belly and neck a dir
hind the pectoral fins. Upper jaw
and thick. Each jaw furnishe
teeth, presenting a serrated or rag
Teeth gathered into a patch at t
broad and smooth. Throat wide ar
In addition to the nostrils there are
the snout. The anal, caudal, and
contained five hundred and thi

skin
A. 5
Sworn to before me this 30th
October, 1818.
James Hubbell,
Justice Peace.
I DO hereby certify, that five pills given in
by M. F. A. Hubbell, Justice Peace.

MURÆNA.

Generic character.

Body eel-shaped. Pectoral fins none. Spiracle on each side of the neck.

Sea snake. (Muræna meleagris.) A specimen with small mouth, rows of sharp teeth, spotted body, and dorsal fin continued round the tail to the anal, in Scudder's Museum. Length two feet and more than a half.

OPHIDIUM.

Character.

Head somewhat naked. Teeth in the jaws, palate, and throat. Branchiastegous membrane seven rayed, patulous. Body ensiform.

1. *Spinous ophidium. (Ophidium mucronatum.)* With a minute spine on the sternum, and another opposite to it in front of the dorsal fin.

Length seven inches; depth one. Has a peculiar odour when first

taken, in the opinion of some persons, like that of boiled crabs. Skin smooth and scaleless. Lateral line almost straight, and near the middle. Body ensiform, or flattened sideways, and tapering toward the tail. When held up to the light, the backbone can be distinguished. The pectoral fins small, rounded, and yellow, composed of twelve or thirteen rays. Between them and the sternum is a minute spine, and another at the commencement of the dorsal, right opposite to it.

Head rather small, and distinguished from the body by a groove or depression. Cheeks have a distended or inflated appearance. Mouth somewhat contracted; and the jaws furnished each with a row of sharp little teeth. Eyes large, approximated, and of a reddish yellow hue. Gill membrane five rayed, and projecting over the lower side of the neck. Belly, pectoral and caudal fins yellow. Branchial membrane of the same colour, but paler. Anal fin narrow, and yellowish, but alternated with pale brown spots, or marks, to the number of sixteen, or thereabout. Dorsal of a similar hue, though more faint than the others, and reaching almost from the back of the head, in the form of a narrow fillet, quite to the caudal.

The anal fin is not so wide as the dorsal; and extends from the vent to the caudal.

From the points of junction with the caudal and anal, the caudal proceeds in a rounded or convex and delicate form, composed of eleven or twelve rays. The skin is of a dark brown, with indistinct spots and clouds; and, by careful inspection, ten or more darker spots can be traced straddling the back, and bestriding the dorsal fin. Caught in the salt water at Brooklyn.

2. *Cirrhus ophidium*. (*Ophidium barbatus*.) With a beard of unequal cirrhi, hyaline body, and a black border around the dorsal, caudal, and anal fins.

Length full nine inches; depth almost one and a half; thickness three quarters. Scales few, very minute and deciduous. Head moderate. Upper jaw projects over the lower, and receives it. Small file-like teeth in the jaws, palate, and throat. Eyes large and white. Body semi-transparent, and allowing the vertebræ to be half visible through it. Dorsal and anal fins united round the tail, and neatly trimmed with a black border. A speckled stripe on each side of the dorsal fin. Lateral line gently curved to the back, and running through a radiated or stellated stripe. Beneath this a row of indistinct spots; and under them, in the abdominal parts, six or seven faint clouds. Belly white, with yellow pectoral fins, and a yellowish tinge about the neck and chin.

But the most remarkable feature of this fish is a cirrus of four divisions, proceeding from the middle of the branchial membrane. Two of these are on the right, and two on the left. One pair is about an inch and a quarter long, and the other pair half that length. All the four arise from a common base; and the long one and short one on each side seem to be but branches from the same root. They almost resemble bifid ventral fins.

AMMODYTES. LAUNCE.

Generic character.

Head compressed, narrower than the body. Upper lip doubled. Lower jaw narrow, pointed. Teeth small, sharp. Gill membrane seven rayed. Body long, roundish, with very small scales. Tail distinct. *Sand launce.* (*Ammodytes tobianus.*) With the lower jaw ^{shorter} longer than the upper. Length from eight to twelve inches. Colour silvery white. Dorsal fin in a groove; and the other characters corresponding to the descriptions of the modern ichthyologists.

Generic character.

Head stretched forwards, with lateral gill-covers. Teeth ensiform, semi-saggitated at the tips. Gill membrane, seven rayed. Body ensiform, compressed, with subulate finless tail.

Silvery hair-tail. (*Trichiurus argenteus*.) With the lower jaw jutting beyond the upper, and a snake-like tail.

Length two feet and four inches; depth at the belly two inches and a half. I measured one, August 1, 1814, that was three feet and two inches long, which weighed one pound and a quarter. Figure flat, and thin sideways. Colour silvery, with a golden lateral line. This descends from the gill opening, and runs low along the belly. Dorsal fin reaches from the back of the head almost to the tail, which is finless, and ends in an attenuated point. No anal nor ventral fins; but a row of notches or spines along the tail, as far forward as the vent, rendering it somewhat carinated. Gill openings wide. Eyes yellow, and occupy much space in the flat vertical cheeks. Space between the eyes flattish, giving the head an angular configuration. Nostrils ample. Mouth capacious, and jaws armed with teeth. Lower jaw projects, and has two teeth jutting beyond the upper, when the mouth is shut. The upper jaw has, in front, from three to six teeth longer than the rest. All the teeth of the larger order are jagged on the inner or hinder sides, with a single barb toward their points. Throat capacious, and tongue smooth. No scales. Laterally the teeth of the upper jaw project over the sides of the lower. And when the jaws are closed it is frequently possible to look through the mouth from side to side.

There is a specimen of trichiurus in Mr. Scudder's Museum, that is alleged to have been swallowed by another fish. Both are preserved

in a bottle. The swallower seems to be a mackerel, and is really smaller than the fish he forced down his throat. The effort cost him his life, by bursting the stomach and the belly; and two creatures are shown as proofs of the fact.

STROMATEUS. BROAD SHINER.

Generic character.

Head compressed. Teeth both in jaws and palate. Body rhombic-ovate, compressed, lubricous.

1. *Cryptous broad shiner.* (*Stromateus cryptosus.*) With a row of holes on each side of the back. A curious and beautiful fish, eight inches long, and five deep. Body flat laterally. Head rounded in with the body. Mouth small. Jaws have a fine serrated margin. Tongue distinct, smooth, and spotted. Palate and inside of the mouth also spotted. Gill openings narrow. A small spine just behind the vent. From its blunt head the body increases to the aforesaid width, and then becomes very narrow near the tail.

Dorsal fin reaches from the top of the back almost to the tail; anal from the neighbourhood of the before-mentioned spine to the root of the tail.

Three lateral lines; middle one straight, running from the upper part of the gill opening to the middle of the tail. The upper one forms a curve upward, the extremities of which almost touch the extremities of the straight line, resembling an arch and its chord. The lower one is about equally curved downward, and its ends approach about as near to the middle line. Middle and lower lines smooth, while the upper one is roughened with scales. Few or no other scales on the skin.

Colour along the back a pale ash, with tints of blue and green. On each side of the dorsal fin, twenty-two or more openings in the skin, like excretory ducts, in a longitudinal direction. In front of the dorsal fin, a spine directed forward. Remaining colour, a lucid white, reflecting light from the broad side, in variegated iridescent tints. Sometimes there is a smutty patch behind the pectoral fin.

No teeth in the palate or throat ; but the stomach contains an apparatus of toothed projections to aid concoction. The sides are marked from back to belly with parallel waved or zigzag lines ; but those lines are not tints of the skin. Caudal fin deeply forked. Lower jaw shuts within the upper, and has the appearance, after death, of seeming longer as it gapes open. Rays, Br. 7. P. 20. D. 45. A. 37. C. 25. A delicate fish to eat.

2. *Harvest fish*. (*Stromateus longipinnis*.) With extended dorsal and anal fins.

So called by some of the fishermen, because he visits the coast about the season of harvest. Length scarcely seven inches ; depth four, and including the dorsal and anal fins, more than six ; thickness not above one. Head short, blunt, and associated with the body. Nose obtuse, and rather receding toward the upper lip. Mouth small. Lower jaw shuts within the upper. Lips beset with minute serrated teeth. Tongue, palate, and throat, smooth and spotted. Skin silvery, with tints of blue, green, and iridescent. A cloudy patch extending from the nose toward the dorsal fin, and over the eyebrow to the gill opening. Inky patches now and then on the belly and toward the tail, which change their hues according to the angle of light, and in certain positions, appear beautifully red and purple. Back bluish, with occasional clouds. First fifteen dorsal rays longer than the rest, and five or six of them measure almost two inches.

The foremost six or seven of the anal more than two inches in length.

Tail deeply forked. Waving parallel zigzag lines, distinguishable on the broad side. Vent far forward. Is broader and shorter than the cryptosus. Fine eating.

Rays, Br. 5. P. 21. D. 44. A. 44. C. 19.

Order, JUGULARES.

COD. GADUS.

Generic character.

Head smooth. Gill membrane seven rayed. Body oblong, covered with deciduous scales. Fins all covered by the common skin. Dorsal and anal generally more than one, the rays unarmed; ventral fins slender, ending in a point.

* Codfish with three dorsal fins, and bearded mouth.

1. *Bank cod.* (*Gadus morhua.*) Great cod fish, of an ashen colour, with yellowish spots, broadish scales, and first ray of the anal fin stiff or spinous.

This fish is found at times in the New-York market, being caught in the sea near Nantucket, and beyond. We get him, however, only in the cool season; for the summer temperature of our waters kills him. He is, therefore, only found between November and April.

The character is so exactly that of the later European writers, that I deem it unnecessary to give a particular description of him. He is not common on our stalls. But the species next to be mentioned is much more frequent.

2. *Common cod of New-York.* (*Gadus callarias.*) With ashen back, white belly, head and body spotted with brown; even tail, and projecting upper jaw.

A middle-sized fish of this species is twenty-five inches long, and weighs five pounds and a half. Colour pale ; also prettily spotted with yellowish. The lateral line grows broader and plainer until it reaches the part of the body situated between the third dorsal and second anal fin. It is nearly straight until it reaches the place of a line drawn perpendicularly from the vent. Tail even. Jaws, palate, and throat, all toothed. Lower jaw has one row of teeth ; upper several. First and second rays of the ventral fins separated or bifid ; and their hue reddish, or whitish. No spines upon the anal, or any other fins. Upper jaw longer than the lower.

I have noted this fish as the *Dorse*, or *Gadus callarias*, notwithstanding his great size, and some other well-marked differences. Should the character not correspond, he must be a different species.

Of this fish there is a remarkable variety.

(a) The *Shoal-cod*, or *School-cod*, is exactly the same with the preceding, but of a different complexion. The hue is more of a greenish yellow, and the scales are more distinct. The fishermen say that it is found on sandy bottoms, while the yellow-cod, mentioned, is caught on the rough bottoms. It is a practical and sufficient one.

There is a further variety, called the *Rock-cod*.

(b) The *Rock-cod*, (*Gadus rupestris*), which is chiefly distinguished by his dwarfish size, rusty complexion, and more chubby shape.

3. *Tom cod*, (*Gadus tomcodus*.) The length is about ten or twelve inches. Snout round and blunt. Mouth considerably under, and of a moderate size. Small teeth in the jaws, palate, and throat. Tongue distinct, white, fleshy, and small. Lateral line incurvated upward. Ventral fins bifid. The second ray longer than the first. Eyes small and yellowish. Tail convex.

October 22, 1871.
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This fish appears under various forms, which makes his history difficult to write. I shall attempt an enumeration of the principal.

(a) *G. tomcodus fuscus*, or *brown tom cod*; with the back and upper parts of the sides a mottled brown or olive. Chin and belly often carnation.

(b) *G. tomcodus luteus*, or *yellow tom cod*; with darker brown or olive on the back and sides, intermixed with yellow there, and along the belly.

(c) *G. T. luteo-pallidus*, or *yellowish white tom cod*; with yellow and white mixed with different shades of brown and olive.

(d) *G. T. pruinosis*, or *frostfish*; has been supposed by some to be a different species. The reasons of this opinion are, 1. That the frostfish is said to be smaller; 2. That in the frostfish the first ray of the ventral fin is the longest, whereas, in the tom cod, the second ray is the longest; and, 3. In the frostfish there are five, six, or more bars or zones of a brown colour along the sides, while the tom cod is merely mottled. He is called *frostfish* because of his appearance more abundantly after the commencement of the frosts in November; though he is caught in the salt waters of New-York all the year round. There has been a variance noted in the rays of his fins wide enough, in the judgment of some, to make him a distinct species,

(e) *G. T. mixtus*, or *mixed tom cod*; with yet other modifications of colours, and with variations in the rays of the fins.

Still the species and all its varieties are called, without any discrimination, tom cod, or frostfish, according to the fisherman's fancy.

The difference of sex and age evidently increases the varieties of this species. And so numerous and perplexing are they, that the specific name might, with propriety, be *multiform*, or *G. polymorphus*.

As far as I can ascertain, by reiterated countings, the more usual number of the rays in the fins is as follows: branchial, seven; ventral,

six ; pectoral, seventeen ; dorsals, thirteen, eighteen, and nineteen ; anals, twenty-two and eighteen ; caudal, thirty-nine.

4. *Haddock*. (*Gadus aeglefinus*.) Has a whitish skin, a black lateral line, forked tail, and an upper jaw longer than the lower.

Is occasionally found among the other species of *Gadus* in the New-York market ; and in addition to the before-mentioned characters, is distinguished by the dusky cast of his back, his large eyes, and small round scales. Length, when full grown, about twenty inches.

5. *Blennoid Cod*. (*Gadus blennoides*.) So called from his resemblance to a blenny. The mouth has minute rows of sharp teeth in both jaws. Two toothed spots or patches on the palate. Throat streaked lengthwise. Lateral line curved. Eyes large. Colour brown, but less so on the belly than back. Flesh soft. Vent nearer the head than tail. Ventral fins bifid, and extending like threads. Tail even ; or rather projecting toward the middle rays. The branchial rays are six ; pectoral, thirteen ; dorsal, ten, sixteen, thirty-six ; ventral, two ; anal, forty-five ; caudal, twenty-three.

* * Codfish with three dorsal fins, and beardless mouth.

6. *New-York Pollack*. (*Gadus purpureus*.) With greenish, spotless back, forked tail, and purplish fins.

His length is about twenty inches, and depth five. The snout is rather pointed. The lower jaw is longer than the upper. Tail divided. Ventral fins short and small. Colour of the lips, inside of the mouth, and gill-covers, purplish and dark. Jaws finely toothed. Small patches in the palate. Eyes large and silvery. Lateral line white, straight, and broad ; becoming more short and narrow toward the tail.

Colour of the back a dusky olive, or bottle green, without spots. Sides and outer gill-covers pale, with tints of yellowish, and becoming whiter at the belly and chin. Dorsal and pectoral fins dusky green ; caudal and both anals purple ; ventrals faintly reddish ; though there

is some diversity in these particulars. The rays in the fins are Br. 7.
V. 6. D. 15—19—23. P. 21. A. 20—19.

* * * Codfishes with two dorsal fins.

7. *Hake*. (*Gadus merluccius*.) With double rows of sharp teeth ; broad and scaly lateral line ; beardless chin, and even tail.

The specimen before me is about fifteen inches long ; two deep ; and five in girth. Caught with the other cod. The head is rather long ; and the body is slender, and tapers away to the tail. The colour of the back is a pale brown ; of the belly a dirty white. No cirrhus to the chin. The mouth is wide and capacious. The lower jaw is longer than the upper ; and both are armed with acute and hooked teeth, in a two rowed and formidable array. The back part of the tongue, the palate, and the throat, are also patched with teeth. The palate, throat, and lining of the gill-covers, are dark coloured. Grooves and channels on the top of the head. The eyes are very large, with a yellow iris and brown circumference. There are two dorsal fins, the foremost of which consists of twelve rays, and the hindmost of thirty-eight. The gill membrane has seven rays ; the pectoral fin thirteen ; the ventral seven ; the anal forty-one ; and the caudal twenty-seven.

The lateral line runs nearly straight from the upper part of the gill opening, to the middle of the tail, and is furrowed in such a manner as to give it a broad and double appearance. The scales are deciduous from the back ; more adhesive to the belly ; and frequently stick to the line. There are five or six small warts in a row along the line not far from the gill opening. The ventral fins are shorter than the pectoral, and both are pointed. The vent is nearer the head. The extremity of the tail is even ; and the gill cover is rather peaked behind.

8. *Slender Cod*. (*Gadus tenuis*.) With bearded chin, streaked throat, convex tail, and bifid ventral fins.



Is about fifteen inches long. Has brown back and sides ; but not so much so below as above. The fins are dark brown, save the ventral, which are whitish and long, ending in red bifid extremities. Eyes of moderate size, and black. Lateral line curved upward. Mouth and palate furnished with sharp teeth. Tongue smooth. A small cirrus beneath the chin. Tail roundish. Throat internally streaked with red and purple. Vent nearer the head. The rays in the fins are, Br. 7. V. 2. P. 16. D. 11---54. A. 44. C. 25.

9. *Codling.* (*Gadus longipes.*) With lanceolated body, very long ventral fins ; and first ray of the anterior dorsal elongated and flexible.

Length about twenty inches ; depth three and a half. The first ray of the first dorsal almost six inches long. Body long and tapering. Scales besmeared with slime, rendering them slippery, and rather obscure. Head sloping, roundish, and smooth. Eyes large and pale. Upper jaw projects. Beneath and within it a distinct moveable lip. Lower jaw shuts easily within this lip. The upper lip and lower jaw are furnished with rows of small teeth. Palate and throat also toothed. Tongue large, smooth, and fleshy. Sides of the tongue and inside of the throat smutty, or dotted with black. Mouth capacious ; gill-openings ample. A small cirrus under the chin. Weighs sometimes as heavy as eighteen pounds. The ventral fins are six inches long, bifid, tapering, and reddish.

The lateral line begins over the branchial opening, and runs nearly parallel with the back. Colour of the back and sides a ruddy brown ; of the belly, white, tinged with yellowish. Dorsal and anal fins terminate abruptly, and leave a short unoccupied space between themselves and the tail ; the body having at that place become narrow and slender.

This is the *hake* of the New-York fishermen.

Rays, B. 7. V. 2. P. 17. D. 10—54. A. 49 C. 21.

10. *Spotted Cod.* (*Gadus punctatus.*) With a black spot in the anterior dorsal fin, black-tipped anal fin, and speckled lateral line.

Length, ten inches ; depth, nearly three. Figure, that of a fish with a small head, large body, and rather diminutive tail.

Colour of the back and sides, pale brown, or whitish ; with lines between the scales. Hue of the neck and belly, a dull white, with suffusions of cream colour. Two dorsal fins ; of which the foremost has eight or nine rays. It is brown for a short distance above the back ; then becomes white ; above, it exhibits the form of a black spot ; is surmounted by the white tips, or summits of the rays.

The second dorsal consists of about forty-seven oblique rays ; and reaches almost to the tail. It varies but little from the colour of the back.

The anal fin reaches almost all the way from the vent to the tail. It consists also of about forty-seven rays. It is browner than the contiguous parts. Its extremity, or lower margin, is black.

The ventral fins are two cleft ; and lilac or flesh coloured ; second ray is two inches long.

The pectoral fins are thirteen rayed, and roundish. Caudal fin, twenty-three rayed, tapering at the sides, and nearly even at the end.

Lateral line distinct and peculiar ; consisting of a narrow black mark, extending from the upper part of the gill opening to the tail, and alternating at spaces of half an inch apart, with white dashes about one eighth of an inch long. The black and white of the lateral line make a striking and pretty appearance.

Chin has one small cirrus. Lips, palate, and throat, armed with minute sharp teeth. Mouth capacious. Eyes large and whitish. Lower jaw shuts within the upper. Scales soft and very deciduous.

In some individuals there is an imperfect whitish straight fillet under the lateral line. This is one of the rarest of the enumerated species.

Generic character.

Head sloping. Body lengthened, sub-compressed, lubricous. Gill membrane six rayed. Ventral fins two, three, or four rayed, unarmed.

* With plain head.

1. *Fringed Blenny.* (*Blennius ciliatus.*) With green-tipped teeth, white-bordered fins, and caudal fin united to the anal.

Length about twenty inches. In March, 1813, a considerable number of these fishes were exhibited in the New-York market. The head was large and shelving. Upper jaw projected over the lower, and received the lower within it. Teeth two rowed in the front of the lower jaw, and three rowed in the upper. Their points roundish and greenish. Chin smooth.

Dorsal fin reaches from the back of the head almost to the tail. Caudal fin united to the anal, and continued along to the vent. Ventral fins small, smooth, tapering to points, and not digitated nor branched. All the fins yellow almost to their edges, and there they are fringed all round with a white border.

Gill membrane has six rays; and the pectoral fins about twenty. The fish was good eating; but the bones, after cooking, neither turned green, nor became phosphorescent. Nor has the least further tint of greenness appeared from that time to this.

2. *Smooth Blenny.* (*Blennius pholis.*) With unadorned head, even body, brown line, with whitish marks lengthwise, and a half way lateral line.

The specimen now before me was brought immured between the shells of a dead oyster, from Chesapeake bay, in March, 1814. The length was three inches and a quarter; and the depth three quarters of an inch.

The head was large and fleshy. The mouth was furnished with a single row of fine, thickset and comb-like teeth, in front. These do not extend far back, but are found only in the forepart of the jaws.

The skin was soft and uniform, without scales. The colour was brown, with whitish clouds and lines, along the back and sides, and of a paler hue on the belly. Fins brown, or of the complexion of the back.

The pectoral fins were broad, roundish, and composed of twelve rays. The dorsal fin extended from the back of the head almost to the tail, with a broad expansion; and possessed twenty-nine rays. The vent was about midway of the body; and the anal fin reached from it nearly to the tail, containing nineteen rays. The tail was rounded, and formed of fifteen rays. The ventral fins were two rayed, and slightly bifid.

The gill membrane contained six rays, and was closed beneath, leaving a narrow opening above and before the pectoral fin. The lateral line became indistinct, after forming a gentle curve about half the length of the fish; and, indeed, vanished, so as to be incapable of being traced any further.

3. *Large-lipped Blenny.* (*Blennius labrosus.*) With a broad upper lip; approximated eyes; smooth skin of a yellowish green or olive, with dusky clouds; anal, caudal, and dorsal fins united; and with white teeth in both the jaws, and in the throat.

The length of the individual before me is about twenty-eight inches; depth three inches and a half; and breadth across the jaws where the body is widest is nearly four inches. It was taken at sea among the cod fishes, and brought with them to market. The weight was three pounds and rather more than one half. The upper lip is uncommonly thick, and overhanging. The lower lip is also skinny and fleshy, but shuts completely within the upper. The gape of the mouth is very wide. The tongue broad, white, cushion-like, and smooth; the palate exten-

sive, and likewise smooth. Both jaws beset with sharp white teeth, huddled in the front of each into two or three rows. The throat is very wide, and beset with two patches of teeth above the pharynx, and two rows beneath. The nostrils are tubular.

The gill membrane has six rays; it is united below, and opens backward toward the pectoral fin by a moderate slit. All the fins are covered by the common skin; and they are wholly destitute of spines and indurated processes of every kind. The eyes are approximated, rather small, and brownish. The snout is convex and fleshy; but not crested. The cheeks are puffed or pouched.

The colour olive, inclining somewhat to yellowish, interspersed with dusky clouds, along the back and sides; the belly paler, with a tincture of reddish. The front dusky, with smutty dashes over the cheeks, and a spot as large as a half dollar or more, on each side, between the eye and the gill cover.

The dorsal fin begins at the back of the neck, and is continued round in connexion with the caudal and anal, until it almost reaches the vent, which is nearer the head than the tail, and is only eleven inches from the extreme point of the upper jaw. These fins have somewhat of a greenish hue; and are fringed with a margin of orange, that is yellowish above, and ruddy beneath. There is, however, a break in the dorsal fin near the tail, and there the rays are short and spinous to the number of eight or nine.

From the broad head and flabby lips, the body becomes lanceolate, and tapers away, after the manner of cod fishes and eels toward the tail. The pectoral fins are obliquely rounded, large, and orange-coloured toward the middle and lower extremities. The ventral fins not more than three quarters of an inch long, situated near each other, two rayed, blunt, and orange coloured.

The pectoral fin has about nineteen coarse rays ; the anal fin has one hundred and three distinguishable rays ; and the dorsal one hundred and twenty-five ; beside the caudal expansion, where the rays are confused, and not easy to be counted. With the before-mentioned exception of a few stiff and sharp rays, where the dorsal fin is interrupted, all the fins and processes are soft.

Described from nature on the 27th of March, 1815.

Order, THORACIC.

ECHENEIS. REMORA.

Generic character.

Head furnished above with a flat ovate, transversely sulcated shield. Gill membrane six rayed. Body without scales.

1. *Big Oceanic Sucker.* (*Echeneis neurates.*) With olive brown back, dirty white belly, intermingled with green, and twenty-four bars across the shield above the head.

The living specimen which I examined fresh from the water, on the 8th of July, 1814 was in length thirty-one inches, in girth ten inches and a half ; and weighed four pounds and eleven ounces.

Lower jaw juttet considerably beyond the upper ; and the upper side of its point was rough, with short and small teeth, which could never come into contact with those in front of the upper jaw.

Figure of the shield above the head elliptical, rather inclined to oval ; its longer diameter six inches and a half ; its shorter two and

three quarters. It contained twenty-four bars separated through the middle.

Upper jaw, palate, and tongue, rough, with grater-like teeth, that are small and blunt.

Colour of the back a dusky brown, or olive, interspersed with whitish clouds. Belly and neck dusky white, with carnation and green about the gill membrane, and greenish along the chin, cheeks, neck, pectoral fins, belly, vent, and root of anal fin away to the tail. Skin scaleless. Lateral line rather obscure, especially toward the tail. A whitish longitudinal cloud, on each side, near the belly.

Tail not convex; though my specimen might have been, perhaps, deficient in that part. Is evidently the species already known.

Rays, Br. 9. P. 19. V. 5. D. 34. A. 34. C. 21.

2. *Small oceanic sucker.* (*Echeneis remora.*) Brown sucker, with eighteen bars across the head, and a concave tail.

The specimen I have before me is the same with that called the Mediterranean remora. It has eighteen stripes across the shield, which is separated by a longitudinal bar. The flattened head, the small eyes, the prominent lower jaw, the uniform brown of the skin, the smoothness, and the lunated tail, are so well described in the books, that there is no need of enlarging this description.

CORYPHÆNA. SAILOR'S DOLPHIN.

Generic character.

Head sloping suddenly downwards. Gill membrane five rayed. Dorsal fin the length of the back.

Common Coryphæna. (*Coryphæna hippuris.*) Blue green coryphæna, with orange-coloured spots, sixty rays in the dorsal fin, and a forked tail.

This fish is well described in the books of modern writers, so cor-

rectly figured by their engravers, and so frequent in collections of natural history, that I forbear to give a circumstantial account of him.

GOBIOUS. GOBY.

Generic character.

Eyes approximated. Gill membrane four rayed. Ventral fins united into the form of a funnel, or circular hollow.

Variegated Goby. (*Gobius viridi-pallidus.*) With pouched cheeks, rounded tail, and pale bars to the number of seven or eight, diversifying the greenish brown hue of the sides.

Is about two inches and a half long, and inhabits the bay of New-York. The eyes are approximated, and look upward. There is a groove along the middle of the back, in front of the dorsal fin. The gill-opening is rather small, its lower part being shut. The body is destitute of scales. The skin is smooth and greenish brown, with seven or eight perpendicular whitish streaks. The cheeks are plump, as if inflated, and give the head a turgid appearance.

There are two dorsal fins, the foremost of which has six rays, and the hindmost fourteen. The ventral fins are united into a sort of canal, or funnel, and enable the fish to fasten himself to rocks and stones. One of the individuals, now lying before me, adhered so firmly to a stone, that he was lifted out of water by an oysterman. The tail is convex, and composed of seventeen rays. That, and all the fins, dark brown, with a bluish shade in the dorsals, caudal, and anal.

Rays, Br. 4. P. 16. V. 12. A. 12.

Generic character.

Head broader than the body, spiny. Eyes vertical, and furnished with a nictitating membrane. Gill membrane six rayed. Body (in most species) without scales, attenuated toward the tail. Dorsal fins (chiefly) two.

Eighteen-spined Bullhead. (*Cottus octodecem-spinosus.*) With white belly dashed with inky spots, two banded dorsal fins, and eighteen spines about the head.

Called *pig fish*, from the squeaking noise he makes immediately on being taken out of the water. Another of his names is *sculpin*. Length about twelve inches. Big, broad, long, channelled, and thorny head. Spines on the head, neck, and gill covers, to the number of nine on each side.

Upper lip distinct. That, and the lower jaw, beset with minute teeth; as are also the palate and throat. No tongue. Mouth wide and capacious. Lower jaw received within the upper. Body tapers away to the tail. Eyes large and approximated, and of a yellowish red colour. Lateral line rather prominent, feeling like a seam, and corresponding with the back. Skin without scales and whitish, with an irregular discolouration of brownish or muddy. Pectoral fins broad, oblique in their insertion, and yellowish, with broad zones. Ventral whitish, with inky stains. Dorsal, anal, and caudal, dark, with white bands. Belly white, and stained with atramentous blots. Gill openings ample.

Rays, Br. 6. P. 18. V. 3. D. 8—16. A. 13. C. 12.

2. *Brazen Bullhead.* (*Cottus aeneus.*) With brass-coloured complexion, thorny head, and rusty blotches over the sides.

Length five inches and a half; depth one. Lateral line distinct enough to be felt, and straight. Colour below the line yellowish, or rather brass-coloured, with rusty blotches. Belly brassy white. Hue above the line pale brown, with ferruginous patches. All the fins except the ventral light, with darker stains. Ventrals white, with similar marks. Two dorsals.

Head, gill-covers, and thorax, armed with spines to the number of nine or ten, on each side; though those on the top of the head are less distinct. Body tapering away to the tail. Head large, rough, and bony. Mouth wide. Tongue large. Upper jaw projects, and admits the lower. Numerous minute teeth in the jaws, palate, and throat.

Rays, Br. 6. P. 15. V. 4. D. 10—14. A. 10. C. 15.

3. *Lasher Bullhead, or Father-lasher.* (*Cottus Scorpius.*) Brown bullhead, with whitish variegations, several spines on the head and upper jaw longer than the lower.

Length of my specimens not much above six inches. Head armed with spines and prickles; but less prominent than in the preceding species. Upper jaw receives the lower.

Colour brown, with whitish variegations, and a reddish tinge beneath. Belly white. Dorsal and anal fins run close to the tail. All the fins zone-spotted. Eyes vertical. Head broad; and the other characters very much like those ascribed to this fish in the books of ichthyology. ✕

SCORPÆNA.

Generic character.

Head large, aculeated, cirrhose, obtuse, without scales, sub-compressed. Eyes placed near each other. Teeth in the jaws, palate, and throat. Gill membrane seven rayed. Body fleshy. Dorsal fin single, with the rays of the fore part spiny.

Yellow scorpena. (*Scorpena flava.*) With ten pairs of cirri on the upper lip, head and gill covers; with about an equal number of bony protuberances about the head and eyes; with six pairs of cirri beneath the lower jaw; and a tubercular (not a cirrhose) lateral line.

The length of the specimen now before me is fourteen inches; the breadth three and a quarter; and the depth two and a half. He resembles the bullheads by his large mouth, and knobby huge head. He has a distant affinity to the gurnards by his large and rounded pectoral fins; and the whiskers, at the extremities of the upper lip, have a remote similitude to the catfish's. He was taken at sea, with the cod fishes.

His colour, from head to tail, is of a fine lemon yellow, with trifling variegations of brown or blackish, on the sides and fins.

The head is rough and tubercular, but not spinous. About twenty knobs can be counted. Cirri grow out of the skin, near the upper lip, eyes, and cheeks, to the number of twenty or thereabout. Two, near the corners of the mouth, have the appearance of small mystaces.

The eyebrows are rough and knobbed. The space between them deeply channelled. The eyes brownish, lateral, and approximated.

The cirri to the lower jaw are twelve in number, and several of them are subdivided into fingered or foliated processes. On the lower lip are three.

There are abundance of sharp little teeth in the upper lip, in both jaws, and in the upper and lower parts of his wide and capacious throat.

The dorsal fin is single, and consists of twenty-nine rays. Of these the first sixteen are stiffer than the others, and rapentose. The break between this section of the dorsal rays, and the posterior one is such, that it almost appears as if there were two dorsal fins. This, however,

is not the case. The posterior section has a rounded form when the rays are expanded.

The tail consists of about nineteen rays, which, like all the others in this fish, are coarse, and soft or cartilaginous. Their extremity is almost straight, or bordering rather on the convex form.

The anal fin consists of fifteen rays; and is opposite to the posterior section of the dorsal.

The pectoral fin has a broad and strong insertion just behind the gill opening, and is composed of eighteen rays. It is large and rounded.

The ventral fins consist of three rays, in each of which the foremost is the stoutest.

The gill membrane is seven rayed.

The lateral line is marked by a row of skinny tubercles, and not by cirri.

The skin is scaleless, and loose, like that of some of the anglers, or species of lophius.

ZEUS. DORY.

Generic character.

Head compressed, sloping down. Upper lip arched by a transverse membrane. Tongue, in most instances, subulate. Body compressed, broad, sub-rhomboid, thin, and of a bright colour. Gill membrane with seven perpendicular rays, the lowest transverse. Dorsal fin in most species furnished with filiform projecting rays.

1. *Hair-finned Dory.* (*Zeus capillaris.*) With elongated dorsal rays, deeply forked tail, and lengthened ventral fins.

A rhomboidal, ill-shaped fish, four inches and a half long. Back bluish; sides and belly silvery. Scales none. Lateral line curved upward at the breast like the crook of the letter *a*.

First ray of the first dorsal fin hair shaped, and three inches and a half long. The second ray almost as long as the first. First, second, and third rays of the second dorsal fin two inches long. Five or six short and sharp spines on the back between the two. Ventral fins two inches long, and consisting each of four rays. First ray of the anal fin an inch long. The rays of this and of the second dorsal continued by successive insertions almost to the tail, which is very slender, and deeply forked.

Head slopes greatly. Gill-opening slants very much. Body thin, and distinguished by linear impressions. Jaws edged, but without teeth. In certain specimens, there are four or five banded marks along the back.

2. *Rostrated Dory.* (*Zeus rostratus.*) With an elongated snout, and with a single long ray to the first dorsal fin.

This fish very much resembles the preceding species; but yet differs in several respects. For the body is thinner; the snout is more prominent; the facial angle declines more from the perpendicular. There is a more considerable break, or depression, above the upper lip. The distance is greater from the tip of the chin to the neck. The depression is more considerable at the point where the branchial membrane joins the neck. The space between the branchial membrane and the ventral fins is more prominent. There is but one long ray, instead of two, to the first dorsal fin; and in this the branchial rays are open to the eye; whereas in the *Z. setapinnis* they are concealed by the edge of the gill-cover.

3. *Bristly Dory.* (*Zeus setapinnis.*) With forked tail, short rays to the fins, and those of the vent and back ending in bristly points.

Length eight inches and a half; depth four; thickness not more than one; being a narrow fish when measured from side to side, and deep from back to belly. Taken in the bay of New-York.

Head sloping, gill-opening oblique, and eye round and large, like most others of this genus.

Skin scaleless. Back bluish. Sides and belly white and glossy. Ventral fins exceedingly small. One dorsal fin, consisting of twenty-two rays, that divide into hairy threads. Five spinous processes, with distinct insertions in front of it. One anal fin, composed of eighteen capillary rays like the dorsal. Both are continued back to the root of the tail. This is deeply forked, and is formed of about twenty-three rays.

Lateral line rather more like the letter α than in the former species; for the curvature is complete, and in addition thereto, the straight part is continued some distance along below it.

The pectoral fin consists of seventeen rays, and is long and acuminate.

There are no long rays to any of the fins, either above or below.

PLEURONECTES. FLOUNDER.

Generic character.

Eyes both on the same side of the head. Body compressed, one side representing the back, and the other the abdomen.

The species of this genus have been distributed into two sections, according to the position of their eyes; one of the sections being called *dextrous*, because the eyes of the fish inclined to the right; while the other was denominated *sinistrous*, by reason of their inclination to the left. Bloch's rule to determinè the situation of the eyes is a plain and good one; it is to raise the fish from his side, and place him erect on his belly, with his tail toward the face of the observer. Then the eyes are said to be on the right or left side, as the observer so situated shall pronounce.

But Shaw has made the discrimination extremely intricate, or unintelligible. He writes, that flounders "have the eyes *dextrous*, or toward the right, when the fish is laid with its coloured side upward, and with its abdomen toward the spectator; and *sinistrous*, when the eyes are toward the left, in the above situation of the fish." He has made a confused piece of work of this genus. *Dextrous* and *sinistrous* are mingled together; and there is a want of perspicuity throughout. For example, Bloch makes the turbot a *sinistrous* fish, and figures him so; but Shaw, who agrees with him in the principle, figures the same turbot as having the eyes on the right. To avoid this confusion, we must revert to Bloch's easy and practical rule.

* With eyes toward the right.

1. *Holibut*. (*Pleuronectes hippoglossus*.) This very large and excellent fish is brought plentifully to New-York alive, in the spring, and is distinguished by having an elongated smooth body, soft and mucilaginous fins, white beneath, and brown above. Grows to the size of three hundred pounds, and more. Is brought to us in smacks. Here he is regularly butchered, cut up and exhibited for sale, piece-meal. The head, fins, and flap are reckoned the most savoury parts. Is an exquisite fish for the table. He is so well described already, and so easily distinguishable from every other species, that a circumstantial account of him is deemed unnecessary.

Is brought to the New-York market as early in the season as the arrival of the shad and alewife, or herring; that is, about the end of March or beginning of April. They take him on the shoals of Nantucket, and in the tracts of ocean to the northward and eastward. He is caught sometimes as far south as Sandy-Hook, before the water loses its wintry coldness. As the warmth increases, the holibut changes his ground; for they suppose the summer temperature unfavourable to him. Therefore, at that season he migrates to the banks of Nova Scotia

and Newfoundland, and there enjoys a coolness that is congenial to his nature. In the spring he returns.

The bait employed for catching him is small herring. Generally the last holibut is sold in the New-York market about the first of June; and this is so well understood, that there is then commonly an advance of price.

The flesh is white and nutritious; and may be cooked in almost any way.

2. *New-York Flatfish.* (*Pleuronectes planus.*) With a spine at the commencement of the anal fin, back uniformly dark, and lateral line a little curved.

Lives in the bays and inlets along the coast, nestling and wintering in the mud. Body oblong and smooth. Back of an unmixed dark brown. Belly a clear white. Lateral line crooked a little. Tail rather convex. Caudal fin frequently reddish. Mouth small. Lower jaw rather prominent. Grows to the size of a foot long, and five inches broad. A spine at the commencement of the anal fin. Is called the winter flounder.

Rays, Br. 7. P. 9. V. 6. D. 62. A. 46. C. 17.

(a) *P. p. with a yellow margin on the lower side surrounding the white of that side.* This jaundice-coloured border is about three quarters of an inch in breadth, and makes a striking contrast with the pearl of the contiguous parts within it, and the brown of the adjacent dorsal, caudal, and anal fins.

(b) *P. p. with a white back.* The individual now before me, (April 9, 1815,) has a whiteness of the upper side nearly as clear as that of the nether surface, over rather more than half its extent. The anterior part is blanched in this manner. The dorsal fin very sensibly partakes of the altered hue; but its dark brown is tinged with yellow, especially on the rays. Something of the same kind, though less

distinct, is observable on the ventral fins, and on about a dozen rays of the anal.

The line of demarkation between the dark and the white parts of the back was not regular and definite. It was broken and irregular, going in a sort of abrupt and ragged course across. The white part was not regularly so. Around the eyes, on the gill-cover, at and above the insertion of the pectoral fin, and along the lateral line, were cloudy spots, of different extent, and several of them of nearly the original dark complexion. These spots on the white ground of the skin had a very close resemblance to some cases I have seen of the partial remains here and there of the original blackness in the skin of negroes, that were undergoing the change to white men. The length was five inches; and the breadth three.

3. *New-York Sole*. (*Pleuronectes mollis*.) With cross-striped back, calico-spotted belly, and soft mucous body, without pectoral fins.

A small, ugly, and forbidding fish, of about six or seven inches long, a somewhat oval shape, and three or four broad. Is soft and mucous, without a spine or prickle about him.

Back dark brown, striped transversely, that is, from the dorsal to the anal fin, with five or more entire black lines, some imperfect ones, and occasionally rounded and oblong spots and marks.

Anal, dorsal, and caudal fins, striped through with black, though there are sometimes interruptions, especially in the tail.

Pectoral fins wholly wanting. Eyes minute and approximated. Mouth small, oblique, and toothless. Back overlays the upper jaw, and, from its projecting extremity, the dorsal fin begins, and extends almost to the tail.

Belly pale brown, or rather a dirty white, overspread with roundish or circular spots of dusky brown, exhibiting a calico appearance.

Nether side of both jaws covered with soft warts or tubercles, ex-

tending some distance along the dorsal fin, and over the gill-cover. The small mouth seems to be concealed, as it were, among the surrounding parts. Delicate eating.

Rays, Br. 4. V. 4. P. 0. D. 56. A. 40. C. 16.

* * With eyes to the left.

4. *Plaice of New-York.* (*Pleuronectes aquosus.*) With spots of black, and white or silvery on the back, semi-transparent body, and variegated fins.

A middle-sized fish, measured nine inches from nose to tail, and when the dorsal and anal fins were expanded, five and three quarters across. Another of the largest magnitude was eleven inches long, and eight broad. Is taken in the same place with the *P. planus*; that is, in our shallow bays and coves.

Back brown, interspersed with blackish brown spots. In some individuals a white spot at the origin of the superior pectoral fin; and silvery specks over the head, back, and fins, resembling small flakes of mica. Eyes yellowish.

Edges of the foremost dorsal rays white, as they sometimes double under. Lower ventral white. Fins, mostly, however, variegated with oblong spots.

Mouth oblique and moderate. A protuberance on the chin. Body delicate, and semi-diaphanous. Dorsal fin commences between the right eye and the upper lip. Tail convex. Back, belly, and fins smooth, and free from spines and roughness. Teeth small, though sharp.

From his pellucidity, he is sometimes called the *watery flounder*.

Rays, Br. 7. P. 12. V. 6. D. 65. A. 54. C. 17.

This fish has, by some of our sportsmen and epicures, been called turbot; but they who call him so, show their entire ignorance of ichthyology.

5. *Flounder of New-York.* (*Pleuronectes dentatus.*) With wide, toothed, oblique mouth, and pale brown uniform back.

Grows to the size of twenty-four inches long, and twelve broad, in the south bays of Long-Island, and weighs five pounds. I have seen him even larger and heavier than that. There is considerable variety in his colours and spots.

Mouth oblique, wide, and capacious. Teeth distinct, prominent, and sharp.

Colour of the back and fins commonly a pale brown, without lines or spots; and yet varieties occur, where the spotted appearance is very plain.

Back, belly, and fins smooth, and not spinous. Belly, in the younger fish, partly opaque white, and partly semi-transparent white. Lateral line curved at the thorax. Comes in plenty to the market, and is a remarkably good fish to eat. Is so well characterized in the books, that a more minute description is deemed unnecessary. Is called the summer flounder.

Rays, Br. 6. P. 12. V. 6. D. 96. A. 73. C. 17.

6. *Black-bellied Flounder.* (*Pleuronectes melanogaster.*) With black belly, notched back, and whitish pectoral fins.

This very peculiar fish was bought in the New-York market, on the first day of June, 1814. Length fourteen inches and a half; breadth six and a half.

Eyes on the left. Mouth oblique, wide, and sharply toothed; and the other features resembling the *P. dentatus*.

But the singularity of this specimen was, that the belly was almost as dark coloured as the back; the hue being only a shade lighter. The nether pectoral fin had an approximation to white, from its middle toward the end, and the upper one was somewhat whitish near the tip.

The eyes were high up; the upper one being almost on the back of

the head. There was a notch over which a shoulder projected from the neck a quarter of an inch forward. The dorsal fin commenced from the anterior point of that projection.

There was, besides, a singular resemblance in the scales of the back and belly. They were so much alike, that a superficial observer would suppose the fish was one that swam perpendicularly. The rays of the dorsal and anal fins were the only ones that differed from the preceding, of which he is, probably, but a variety.

Rays, Br. 6. P. 12. D. 84. V. 6. A. 66. C. 17.

7. *Spotted Flounder*. (*Pleuronectes oblongus*.) With spineless body, four spots on his back, and prominent angular tail.

I examined this fish June 30th, 1814, and found his length to be fifteen inches, and his breadth six. He comes in between the *P. maculatus*, and the *P. dentatus*; and is rather a soft and mucous fish; with eyes to the left.

Mouth large, oblique, and toothed. Teeth distinct and acute. Eyes pale yellow, broad, approximated, and separated by a bony ridge.

Lateral line incurved at the thorax, and thence running palpably and visibly straight to the tail.

Colour of the back a mixture of pale brownish and whitish specks, with a sort of semi-hyaline complexion like the watery flounder. Though he has, too, a resemblance to the *P. dentatus*, he is a longer and a narrower fish, as I found by comparing the fresh specimens.

Extremities of some of the anal and caudal rays whitish.

The uniformity of colour is interrupted by four dark spots on the back, two on each side of the lateral line. One of the two on each side, is about midway of the length, and the other near the tail. The former are about three quarters of an inch in diameter; the latter not so considerable.

Tail angular ; that is, the middle ray makes almost a rectangle with the side rays, it is so much longer.

Belly white, with a mixture of the *watery* appearance ; and a tinge of the ruddy, especially in the region of the anal fin. The dorsal fin begins in front of the upper eye. No spine or prickle any where about him. A whitish spot about the origin of the pectoral fin.

Rays, Br. 6. P. 11. V. 6. D. 73. A. 59. C. 17.

SPARUS.

Generic character.

Teeth strong. Front teeth, in some species, disposed in a single row. In others in a double, treble, or quadruple row. Grinders, in most species, convex, smooth, and disposed in ranges, forming a kind of pavement in the mouth. Lips thick. Gill-covers unarmed, smooth, scaly.

Sheep's Head. (*Sparus ovis.*) With smutty face, banded sides, pale complexion, prominent eyebrow, and grooved spinous dorsal fin.

Grows big enough to weigh fourteen or fifteen pounds. One that weighed four pounds and a half measured twenty inches in length, eight in depth, and three in thickness. Sheep's head is the most esteemed of the New-York fishes, and fetches a higher price than any, excepting, perhaps, fresh salmon and trout. The price varies from a dollar to one hundred and fifty cents for a fish of middle size ; that is, from four to seven pounds. Nothing, in the opinion of a New-Yorker, can exceed boiled sheep's head served up at a sumptuous dinner.

The form of the mouth, and a certain smuttiness of the face, have a distant resemblance to the physiognomy of the sheep. Thence comes the name by which he is usually distinguished.

Teeth covered by the lips, which are large and distir ct. Four inci-

sors in each jaw ; and two other teeth situated next to them, one on each side, that may be considered as *canine*. The former are straight ; the latter rather turned inwards. Within, and beyond these, two or three rows of round-topped grinders, making a bony pavement, as it were, inside of the mouth. No cirrhous or roughness of any kind on the head, neck, or snout. Lower jaw shorter than the upper.

Nostrils double. Eyes large, vertical, brown, and connected by a prominent brow. Head united to the body, without any proper neck. Gill-covers broad and smooth. Opening ample. From a scaly spot a little above the branchial aperture, proceeds a coloured and curved streak to the withers. A single dorsal fin, strong and spinous, lowering into a deep furrow the greater part of its course.

The expanded tail measures six inches across, and is neatly concave, or almost lunated. A scaly process near the insertion of the ventral fin.

Lateral line almost corresponds with the arch of the back, and radiates prettily on the scales over which it passes.

General colour of the sheep's head a white, or obscure silvery, with a smutty daubing over the face and chin, a greenish tinge above the brow, and six or seven dark bands or zones of an inch or more in breadth, regularly slanting from back to belly. The latter, a dull white, approaching, in some places and individuals, to cream colour.

Scales large, horny, distinguished by radiated and concentric lines ; and somewhat like a square rounded a little at the corners. They are deeply inserted into the skin ; adhere with remarkable firmness ; and when they are separated, there is discoverable, on the edges of the skin, which enclosed them, a sort of tarnished argentine, or brightish leaden hue. Rays of all the fins coarse.

The pectorals are long and pointed. Tongue white and smooth.

The intestines of the individual I last dissected were lengthy, convoluted, and filled with the fragments of several sorts of crabs. Swim-

ming bladder capacious and thick. Peritoneum, on opening the abdomen, blackish. Two patches of teeth in the upper part of the throat, and two smaller corresponding patches on the lower part, a short distance in front of the entrance of the gullet. But all of these are very inferior in strength and size to those of the mouth.

This noble fish visits the neighbourhood of Long-Island annually. Emerging from the depths of the ocean, he finds, in the recesses and inlets there, a plenty of the crabs, muscles, and clams on which he loves to feed. He confines himself strictly to the salt water, never having been seen in the fresh rivers. His term of continuance is only during the warmest season; that is, from the beginning of June to the middle of September. He then departs to the unknown depths of the Atlantic, and is seen no more until the ensuing summer. I have, however, known him to stay later; for one of the most numerous collections of sheep's head I ever saw in the New-York market, was on the 4th October, 1814. I have seen him as late as the 17th.

The sheep's head swims in shoals, and is sometimes surrounded in great numbers by the seine. Several hundreds have often been taken at a single haul, with the long sweeping nets in use, near Raynortown, Babylon, and Fire-Island. They even tell of a thousand brought to land at a draught.

He also bites at the hook, and several are not unfrequently caught in succession. The outfit of a sheep's heading party is always an occasion of considerable parade and high expectation, as I have often experienced. Whenever a sheep's head is brought on board the boat, more joy is manifested than by the possession of any other kind of fish. The sportsmen view the exercise so much above common fishing, that the capture of the sheep's head is the most desirable combination of luck with skill; and the feats of hooking and pulling him in, furnish abundant materials for the most pleasing and hyperbolical stories. The sheep's

head is a very stout fish, and the hooks and lines are strong in proportion. Yet he frequently breaks them, and makes his escape. Sheep's head have been caught with such fishing tackle fastened to their jaws. When the line or hook gives way, the accident makes a serious impression upon the company. As the possession of the sheep's head is a grand prize, so his escape is felt as a distressing loss. I knew an ancient fisherman who used to record, in a book, the time, place, and circumstance of every sheep's head he had caught.

This fish is sometimes speared by torch-light, in the wide and shallow bays of Queen's county and Suffolk.

The places where he is found in the greatest abundance are about forty miles from the city. He soon dies after being removed from his element, and in such sultry weather, soon spoils after death. They, therefore, remove his entrails, lay him in the water of the coldest springs and brooks, and transport him to market during the coolness of night, with all possible speed, in wagons. Yet, after all, he is too frequently decayed or tainted before dinner time, and thrown away as unfit to eat.

When ice houses shall be established near the fishing places, and along the roads, sheep's head will be brought to New-York in perfection. The transportation of sea fish, in a frozen state, from Long-Branch, in New-Jersey, to Philadelphia, has afforded, to the Pennsylvanians, the specious argument, that their sea basse and black fish, after a transportation of fifty miles by land, are really preferable to the sickly, wounded, lingering, and emaciated fish of New-York.

It is to be regretted the sheep's head too often corrupts for want of ice.

Rays, Br. 4. V. 6. P. 6. D. 24. A. 13. C. 19.

Generic character.

Teeth strong and sub-acute. The grinders sometimes, as in the Sparus family, convex and crowded. Lips thick and doubled. Rays of the dorsal fin, in certain sorts, lengthened into soft or ragged processes. Gill-covers unarmed, and scaly.

1. *Weak Fish.* (*Labrus squeteague.*) With even tail, speckled back and sides, one or more sharp long front teeth in the upper jaw, and yellowish ventral and anal fins.

One of the most numerous and useful of the New-York fishes; particularly during the season when the cold is not considerable. Size commonly from a foot to fifteen inches; but often grows larger. I weighed one, for example, that measured twenty-seven inches in length, by seven in depth, and found him heavier than six pounds.

He never goes into fresh streams, or ponds, but, within the limits of the salt water, is taken in almost all the places where rock fish is caught.

The weak fish is so much the companion of the basse, that I once, gave him the specific name of *comes*.

He resembles the rock in the following particulars: 1. A wide mouth, with small teeth in the lips and jaws; 2. Patches of teeth at the bottom of a capacious throat; 3. Two dorsal fins, the foremost of which has eight rays; 4. A lateral line passing into the caudal fin; 5. A nearly corresponding number of sixteen rays in the pectoral, and seventeen in the caudal, fins; 6. Double nostrils, and an elongated lower jaw; 7. A projecting head; and, 8. Large pale yellow eyes on its sides.

But there are no tangible serræ on the gill-cover. The divisions at

the edge are visible only. They are not bony, but yield to the gentlest touch.

Also, the gill-cover is not fairly tripartite ; but consists of no more than two plain divisions.

From a point near the upper and forepart of the posterior gill-plate, there is an appearance of two or three darkish lines radiating toward its extremity, backward and downward. But these, though they are evident enough to the sight, give nothing bony or sharp to the touch. The finger does not find any thing spinous or aculeated where the eye led to the belief of such a structure.

The weak fish cannot, therefore, be deemed a *perca*. I have been obliged to separate him from his companion, the rock, notwithstanding their numerous points of similitude.

I have, upon the whole, associated him with the great family of *Labrus* ; a connexion for which he seems to be qualified by his smooth and scaly gill-covers, his sharp and strong teeth, and the softness of his dorsal rays.

I have given him the specific name by which the Narraganset natives distinguish him, *Squeteague*. It would have been as easy to have assigned the Mohegan appellation, *Checouts*.

Head and back of the weak fish brown, with frequently a tinge of greenish. The spaces toward the sides faintly silvery, with dusky specks. These gradually disappear on the sides, until, on descending to the belly, a clear white prevails from the chin to the tail.

Mouth wide. Jaws toothed ; and in the upper mandible, one, two, or three teeth, in front, longer and stronger than the rest ; and resembling the fangs of serpents.

Throat, in front of the esophagus, armed above and below with collections of small teeth.

Eight softish rays in the foremost dorsal fin. Pectoral, dorsal, and

caudal fins, light, or pale brown, inclining sometimes to yellowish. Anal and ventral fins pale yellow.

Tail even. Lower jaw longer than the upper.

Lateral line arched upward; and after its descent, runs quite to the extremity of the caudal fin.

Tongue yellow, with minute black dots around the forepart; concave, with a soft and flexible margin; has a frœnum.

The swimming bladder is convertible to good glue. I have eaten as fine blancmange from it, as from the isinglass of the sturgeon.

He is a fish of a goodly appearance; and is wholesome and well tasted, though rather soft. Is brought to market in great numbers during the summer months. He is taken both by the line and the seine. He is called *weak* fish, as some say, because he does not pull very hard after he is hooked; or, as others allege, because labouring men, who are fed upon him, are *weak*, by reason of the deficient nourishment in that kind of food.

Certain peculiar noises under water, of a low, rumbling, or drumming kind, are ascribed, by the fishermen, to the squeteague. Whether the sounds come from these fishes or not, it is certain that during their season, they may be heard coming from the bottom of the water; and in places frequented by weak fish; and not in other places; and when the weak fish depart, the sounds are no more heard.

Rays, Br. 7. P. 16. V. 5. D. 8---23. A. 13. C. 17.

A beautiful variety of this fish is sometimes seen with the following characters, to wit:

Spotted Squeteague. (*Lab. sq. maculatus.*) There are black, well-defined spots among the specks over the back and sides, and chequering the caudal and second dorsal fins. The pectoral fins are rather smaller. Ventral and anal fins not yellow, but brownish.

The parts thus variegated with spots have a pretty appearance.

2. *Black-Fish, or Tautog.* (*Labrus tautoga.*) With head and gill-covers smooth; lips thick, and covering the teeth; one row of distinct teeth in each jaw, with rudiments of more; patches of teeth in the throat; and a single dorsal fin.

Black-fish of New-York. Tautog of the Mohegans. Tide black-fish, or runners. The name of this fish is derived from the colour of its back and sides, being of a bluish, or crow black. Lips, lower jaw, neck, and belly, white, particularly in the males. Mouth rather small. Lips skinny or fleshy. Teeth, to about the number of twelve, in each of the jaws: the two front ones are the largest, and the rest of the respective rows gradually decrease in size. Within the regular empalements, are the points of smaller teeth, inserted with rather less regularity; they are sharp, distinct, and covered by the lips. Tongue white, smooth, lying close, but discoverable by raising. Tail entire, and somewhat convex, the middle rays being rather more prominent than the upper and lower ones.

Gill-cover smooth, and neither scaly, serrated, nor rough. Extremities of the pectoral fins whitish. Nostrils double. Eyes rather small. Back rounded upward, and belly downward, which, together with his well-covered cheeks and head, give him a very plump appearance.

Has a triangular patch of teeth, making a sort of bony pavement, in the lower part of his throat; and two roundish patches in the upper part, just before the orifice of the gullet. The seventeen first rays of the dorsal fin project with naked spines; and to each is annexed a ramentose process. Two spinous rays behind the vent,

Rays, Br. 5. P. 15. V. 6. D. 28. A. 9. C. 15.

The black-fish abounds in the vicinity of Long-Island, and is a stationary inhabitant of the salt water. He never visits the rivers, like salmon or sturgeon; nor, on the other hand, deserts his dwelling-place as they do. He is fond of rocks, reefs, and rough bottoms. He is

taken through the whole course of Long-Island sound, Fisher's-Island sound, and in the neighbourhood of Rhode-Island. The tautog was not originally known in Massachusetts bay ; but, within a few years, he has been carried beyond Cape Cod, and has multiplied so abundantly, that the Boston market has now a full supply, without the necessity of importing from Newport and Providence. Black-fish, however, does not confine himself to rough bottoms ; for he is also caught in the southern bays of Long-Island, and on the banks of the ocean off Sandy-Hook.

He is considered, by the New-Yorkers, as a very fine fish for the table. The price is from eight to twelve cents a pound. He grows to the weight of ten or twelve pounds, and even more ; but it is a fish of good size, that equals two and three.

He may be kept for a long time in ponds or cars ; and fed, and even fattened there. When the cold of winter benumbs him, he refuses to eat any more, and a membrane is observed to form over the vent, and close it. He begins to regain appetite with the return of warmth in the spring. The blossoming of the dog-wood, (*cornus florida*), early in April, is understood to denote the time of baiting black-fish. As soon as these flowers unfold, the fishermen proceed with their hooks and lines to the favourite places. If there is no dogwood, a judgment is derived from the vegetation of the chesnut-tree (*castanea vesca*.) The season of biting is reckoned very favourable until the increasing warmth of the season brings food enough to fill their stomachs, and they thereupon afford less pastime to the sportsmen, and less profit to the professed fishermen. The people express this sentiment in these coarse rhymes :

When chesnut leaves are as big as thumb-nail,
Then bite black-fish without fail ;
But when chesnut leaves are as long as a span,
Then catch black-fish, if you can.

The common bait for black-fish is the soft clam or pisser, (mya.) The soldier crab or fiddler, (ocypoda,) will frequently tempt him when he refuses to taste the other. And he snaps very readily at the large finny worm of the salt-water beaches, (nereis,) when used on a hook for him.

Some persons, who live contiguous to the shores where are situated the rocks frequented by tautog, invite the fish there by baiting. By this is meant, the throwing overboard broken clams or crabs to induce the black-fish to renew their visits; and fine sport is procured.

Rocky shores and bottoms are the haunts of black-fish. Long experience is required to find all these places of resort. Nice observations on the land-marks in different directions are requisite to enable a fishing party to anchor on the proper spot. When, for example, a certain rock and tree range one way, with a barn window appearing over a headland the other way, the boat lying at the point where two such lines intersect each other, is exactly over some famous rendezvous. To ensure success on such an expedition, it is proper to have a pilot along, well versed in all the local and minute knowledge. According to the number and distance of the rocks and reefs visited will be the time consumed, from the duration of a few hours to a long summer's day. An opinion prevails, that black-fish can hear very well; and, for fear of scaring them away, the greatest stillness is observed. He is a strong fish, and pulls well for one of his weight and size.

At some places black-fish bite best upon the flood. In others they are voracious during the ebb. Thunder accompanying a shower, is an indication that no more of them can be caught. The appearance of a porpus infallibly puts an end to the sport. Curious stories are told of fish in the wells and prisons, floating in their native element, having been found dead after sharp and repeated flashes of lightning. Dull weather, with an easterly wind, is generally the omen of ill luck.

The exploits performed in fishing for tautog are recounted occasionally with remarkable glee, and they afford a never-failing theme of entertainment to those who are engaged in this sort of adventure. Though the hand-line is generally used, the rod is sometimes employed to great advantage. The black-fish is remarkable for retaining life a long time after he is taken out of water. He sometimes swims over even ground, and is caught in seines.

There are several varieties, all of which may be occasionally viewed at once on the fishmongers' stalls.

(a) *L. T. fusca*. With bands and zones of a brown colour, and the whole complexion brown.

(b) *L. T. rubens*. With clouds and shades of reddish hue, giving tints to the whole fish.

(c) *L. T. alia*. With yet other mottles, clouds, and marks.

3. *Bergall of New-York*. (*Labrus chogset*.) Chogset of the Mohegans. Blue-fish.

This fish seldom grows more than seven or eight inches long; nor equals as many ounces in weight. Is found in all the waters frequented by black-fish. Lives on the same food, and is very troublesome to fishermen by nibbling away their bait. This pesters them the more, because the hooks for black-fish are too large for the mouths of the bergalls. The resemblance of the chogset to tautog is so striking, that he might be called a black-fish in miniature. It is a large bergall that weighs ten ounces; yet I have seen them heavier than sixteen.

Mouth rather small. Lips distinct, and covering the teeth. When turned back, a grinning appearance is produced. Jaws furnished with a row of sharp, short, and separate teeth; and smaller ones appearing in the gums behind them. There are about sixteen teeth in the upper jaw, and twenty-eight in the lower; beside the irregular and scat-

tering ones. Head smooth and fleshy. About seventeen of the dorsal rays have naked spinous points, and are ramentose between.

Lateral line curved upward, and consisting of a succession of oblique oblong dots. Three ramentose spines before the anal fin. Tail broad, convex, or rather longest about the middle rays. Tongue white and smooth. Colour bluish, bordering on green. The green is plainest about the gill-covers, anal fin, and ventrals. Sometimes the back faintly clouded, and variegated with orange specks. A neat little fish, and tenacious of life when exposed to the air, though less so than the black-fish. A triangular pavement of teeth in the throat below, and two oblong patches above, just before the gullet.

Rays, Br. 5. P. 15. V. 6. D. 28. A. 9. C. 15.

There is a remarkable variety of the chogset, viz.

L. C. fulva. Yellow bergall. A reddish yellow over the whole surface is the distinguishing feature. This is, by some, conjectured to be owing to confinement in cars, or wells of smacks; and in some degree to the coldness of the water in winter. Whether these suppositions be true or not, the fish appears perfectly well formed and healthy.

4. *Fresh-water Sunfish, or Pond Perch.* (*Labrus auritus.*) With speckled sides, yellow belly, and elongated gill-covers, marked with a black and red spot.

Length about six inches; depth two and a half. Body coated firmly with semi-circular scales. Lateral line dotted, and corresponding to the curvature of the back.

Colour various; being a brown along the back, mixed with reddish, rusty, and ochreous, down the sides. Belly distinctly yellow. Ventral fins yellowish; and the pectoral and anal tinged with the same.

A black spot at the extremity of the gill-cover, tipped with scarlet.

Opening of the mouth rather narrow; of the gills moderate. Small serræ or teeth to the lips. Tongue small, and far back.

First ten dorsal rays, and three first anal, spinous.

Lives in fresh water altogether, and is taken both by the hook and seine, for pastime and food.

Rays, Br. 6. P. 14. V. 6. D. 21. A. 12. C. 17.

5. *Big Porgie of New-York.* (*Labrus versicolor.*) With changeable colours, forked tail, and large silvery eyes.

Length twelve inches, and sometimes more ; depth five, and upward. Back regularly gibbous ; belly evenly swelling, making him a handsome fish. Eyes large, with silvery irides, and a brow, or projection forward. Mouth moderate. Lower jaw rather shorter than the upper.

Lips plain and distinct. Within them two rows of short blunt teeth, bedded in each jaw. Palate and throat smooth. No tongue. Gill-cover tripartite and scaly, but with smooth edges. Gill-openings ample. Lateral line nearly corresponding with the curve of the back, and toward the tail inclined downward.

Tail moderately forked. Scales firmly adherent and decussating. Anal fin closes into a furrow. One dorsal fin, which also shuts into a groove along the back ; it consists of twenty-six rays, the first twelve of which are spinous, and three or four also filamentous, near their tops.

The cheek, or space between the eye and upper lip, reddish, or faintly purplish. Nose, forehead, and brow pale, sub-semi-transparent, smooth, soft, and scaleless. Behind the eye, upward, a spot that is whitish, with variegations of green and blue.

Broad side, changeable with altering hues, as the position varies, of pale brown, greenish yellow, yellowish red, and reddish white, with a mixture of blue occasionally interposed. Neck and belly white. A variegated concave scale at the junction of the gill-opening with the lateral line ; and a scalloped and clouded continuation of smaller scales thence to the nape of the neck. A short stiff spine, in front of the dorsal, pointing forward. An incumbent pointed scale near the origin of the ventral fin.

Rays, Br. 5. P. 15. V. 6. D. 26. A. 15. C. 17.

6. *Little Porgie.* (*Labrus obliquus.*) With raised back, oblique bars, and concave tail.

Length eight inches; depth almost three. Has a striking similitude to the *grunts*, but is more high-backed and gibbous. Mouth small and toothless. Lower jaw received within the upper. Tail concave.

Hue whitish, with blackish shades. Fourteen narrow zones slant obliquely from the back toward the belly. Two dorsals.

Rays, Br. 7. P. 20. V. 5. D. 9—33. A. 14. C. 17.

7. *Grunts.* (*Labrus grunniens.*) With zoned sides, bearded jaw, and even tail.

Length seven inches; depth two and a quarter. Back convex, and almost gibbous. Mouth inferior and small. Lower jaw shuts within the upper; has asperities from the points of minute teeth; and after death, opens by its own elasticity.

Body whitish, and banded with three or four zones. The whitish scales alternated with dusky. Tail even. Lateral line bent upward. Two dorsal fins.

Lower jaw bearded with a dozen or more slender cirrhi, situated along the edge of the gill membrane. Throat armed with an apparatus of strong teeth, for cracking and grinding. The first anal ray short and hard; the second longer, strong and spinous.

This fish is called, by the fishermen, *young sheep's head*, and *young drum*, from its resemblance to those creatures. The common name is given on account of a grunting noise he is supposed sometimes to make.

Rays, Br. 7. P. 17. V. 6. D. 10—23. A. 7. C. 19.

8. *Thorn-backed Grunts.* (*Labrus spinosus.*) With a lateral line somewhat serpentine, and seven spiny processes in front of the dorsal fin, of which spines the first inclines forward, and the rest slope backward.

Length seven inches ; depth full three ; thickness scarcely one.
Taken in the bay of New-York.

Head blunt, with the upper jaw much larger, and somewhat longer than the lower. Tail slender and deeply forked.

Colour shining white, with a bluish tinge on the back ; and the back itself elevated into a sort of ridge supporting the dorsal fin. This fin consists of five, six, or seven spines, and twenty-five filamentous rays. Of the spines, the foremost points horizontally forward, and the other six slant backward ; and of the filaments, the five or six are longer than the rest. Snout ends abruptly forward.

The anal fin has twenty-one soft rays, of which the three or four foremost are of greater length. Both this and the dorsal extend to the slender part of the tail. The ventral fins are four rayed, small, and almost connected together by a membrane. The caudal, anal, ventral, and pectoral fins are beautifully tinged with yellow.

The lateral line occasionally departs into small serpentine curves ; and there are parallel waving or zigzag lines between the back and belly, along the broad side. The skin is free from scales, and the general figure resembles the stromat, or harvest fish.

9. *Speckled Grunts.* (*Labrus fulvo-maculatus.*) With yellowish horizontal stripes below the lateral line, and oblique ones slanting toward the back, above it.

Length five inches ; depth one inch and a half. Caught in the bay of New-York.

The colour of this fish is bluish silvery, with a lateral line nearly corresponding to the convexity of the back. Above that line there are rows of yellow speckled stripes, almost parallel to each other, which run obliquely toward the dorsal fin. Below it, similar rows extend, in nearly a horizontal direction, from the gill-opening to the tail. The belly and chin are more pale and whitish than the back.

The back rises with a considerable sweep from the upper lip, and supports a single fin, that lowers into a furrow. This fin consists of twenty-eight rays, the first twelve of which are spinous.

The gill-covers are scaly, and the cheeks marked with the ochreous streaks which distinguish the back and sides. The eyes are pale, with a dash of dark across them. Lips armed with rows, and throat with patches, of teeth.

The tail is moderately forked, or gently lunated, and consists of about eighteen rays.

The gill membrane has seven or eight rays; the ventral fins five; the anal seventeen, of which the two foremost are spinous; the pectoral seventeen. Of these the pectorals are faintly yellow; the rest pale.

10. *Pale Labrus*. (*Labrus pallidus*.) With uniform pale brown sides; a dusky tinge on the posterior edge of the gill-covers; and an inky stain on the tips of the hinder dorsal and anal rays, and on the middle rays, and toward the extremity of the tail.

Length of the specimen under consideration, rather less than three inches and a half; depth one inch and a quarter, without measuring the fins. Is a deep fish, and shaped much like the pond sun-fish, or *labrus auritus*. Caught near New-York.

There is a remarkable uniformity in the colour of this fish. A light, or pale brown, prevails from head to tail, and from back to belly; with no other interruption than a smutty dash at the hinder margin of the gill-cover, and a dark shading at the extremities of the posterior dorsal, anal, and caudal rays.

The posterior lamina of the gill-cover is somewhat silvery. The body well coated with scales disposed in regular rows.

There is one dorsal fin consisting of twenty-one rays; the first ten of which are spinous, and the remaining eleven bristly and elongated. The anal has thirteen rays, of which the three first are spinous, and the rest elongated, to correspond with the dorsal. Caudal rather

rounded, and consisting of about nineteen rays. The ventral fin has six rays, of which the first is spinous. The pectoral has ten rays, considerably lengthened, and tapering to a point. The branchial fin has five rays.

The tail is stout and broad. The mouth is moderate, and the jaws furnished with small teeth. The nostrils are double; and the lateral line curved upward to correspond with the arch of the back.

The fish has very much the habit of a perch, but has no serræ, or points on the gill plates.

SCIÆNA.

Generic Character.

Head scaly. Dorsal fins two, seated in a furrow, into which they may occasionally withdraw. Gill membrane six rayed.

1. *King-fish.* (*Sciæna nebulosa.*) With cirrhous chin, clouded skin, and ragged blunt processes, partly overhanging the upper lip.

Length sixteen or eighteen inches; depth about three; though some individuals are larger. Head and body scaly. Snout projecting, rounded, soft, and smooth. Double nostrils between the eyes and snout. Two other openings, like nostrils, beneath the snout, and near the upper lip. Between these orifices, four ragged blunt processes, like imperfect cirrhi, partly overhanging the upper lip. Both lips furnished with rows of sharp little teeth. Tongue, palate, and throat toothless.

The gill membrane has six rays. Two dorsal fins, of which the foremost is furrowed. The first and second rays unite into a filament, between four and five inches long. A small short spine in front of the first ray. Tail rather lunated or concave.

Colour of the head and body a light brown, glossed with silvery and blue ; and interspersed with spots and blotches of a darker hue. Some of these clouds slant obliquely forward from the dorsal fin ; some run obliquely backward from the nape of the neck ; and some pass midway from the sides to the tail. There is here and there an insulated dark patch, with dirty discolourations toward the white belly.

He grows rapidly thick and stout toward the thorax ; and then gently and gradually slopes away toward the tail.

There is a single cirrus appended to the tip of the chin. Second dorsal extends almost to the tail. Fins pale brown, with whitish spots bordering on yellowish in the ventral, pectoral, and anal. Vent nearer the tail. Lateral line begins near the eye, bends gently upward, and extends to the extremity of the caudal fin.

Rays, Br. 6. V. 5. P. 19. D. 9—25. A. 10. C. 17.

2. *Black Drum*. (*Sciaena fusca*.) With orifices about the nose, cirrhi under the chin, and first dorsal fin received into a furrow.

Length, when full grown, thirty-eight or forty inches ; depth, fourteen or sixteen. Spreads from the back wedgewise toward the belly, which is rather flattish and broad, rendering it easy to turn the dead fish upon the belly for examination. Mouth rather under. Lips round, thick, and fleshy. Nostrils double ; and eight orifices or punctures near the end of the snout, just above the upper lip.

The black drum often equals fifteen, twenty, and even thirty, pounds. The individual now before me comes to thirty-four. I once weighed a drum that was as heavy as eighty pounds. I have been credibly informed of one that weighed a hundred and one pounds. He is taken abundantly during the summer, both with the line and net.

Head big, fleshy, and scaly. A clustered row of small teeth in the gums. Tongue broad and smooth. In the throat a singular arrange-

ment of bones and teeth for crushing testaceous animals. The lower bone is nearly an equi-lateral triangle of two inches on each side. Two other converging bones are adapted to it above. Their surfaces are paved with teeth, which are hard, rounded at the tops, and disposed in rows as nearly as may be ; and they adhere without the aid of rooted prongs.

Cirrhi to the number of twelve, and sometimes of twenty-six, under the chin and along the margin of the gill-cover. Toward the chin, five indentations or holes, large enough to receive the end of a lead pencil.

Scales of the body exceedingly large, stiff, horny, and marked by radiated and concentric lines. Their form receding somewhat from square, and approaching the figure of the letter D. They are so planted in the skin that it is difficult to remove them. Lateral line broad, rather indistinct, and running scaly to the end of the tail.

Colour a dull silvery, like the dross of melted lead, with a faint brassy, and a tinge of ruddy, though between the scales the skin is inclined to blackish on the back and sides, and thereby gives its denomination to the fish. Under the scales the silvery hue is most considerable. A black patch on the side of the older individuals behind the pectoral fin. All the fins inclined to reddish, more especially the caudal, pectoral, and dorsals. The first dorsal spinous, with a spiny stump in front of the foremost ray. The foremost anal very thick and stout, with a stump in the front of it. The first dorsal capable of being partly lowered or depressed into a furrow. Sometimes the space covered or shaded by the pectoral fin is pale or white.

Tail even. Eyes silvery yellow. Swimming bladder very thick and capacious, and a continuation of it, on each side of the thoracic vertebrae, bedded in large cells between the ribs. Large glands near the vent, internally ; probably the kidneys.

His name of *drum* has been given on account of a drumming noise he makes, immediately after being taken out of water.

Rays, Br. 6. P. 18. V. 6. D. 9—21. A. 7. C. 19.

He swims in numerous shoals in the shallow bays on the south side of Long-Island, where fishermen, during the warm season, can find them almost like a flock of sheep. Is a dull sort of fish.

3. *Beardless Drum*. (*Sciæna imberbis*.) Without cirrhi to the chin, with lengthened body, and with a black spot on each side of the tail.

The individual which I examined on the 5th of October, 1814, was nearly three feet in length, eight inches in depth, and nineteen in girth, and weighed sixteen pounds.

Has a row of teeth in each lip, and patches of teeth in the throat, and the general features of the drum. But is not so thick in proportion to his length. His complexion is brighter. In particular the cheeks, gill-covers, and sides round the insertion of the pectoral fins, are of a bright metallic yellowish white. The head is smooth, though with the appearance of scales. The nose has holes and processes as the drum has. Inside of the gill-covers blackish.

The chin has five holes or openings, but has not a single cirrus.

Upon the upper part of the tail, on each side, is a black spot, about three quarters of an inch in diameter, resembling the brand of a hot iron upon wood; whence he has been called the *branded* drum.

The branchial rays are six. There are two dorsal fins, the foremost of which lowers into a furrow, and has ten spinous rays. The second has twenty-six rays. The ventral has five; the pectoral seventeen; anal ten, the first of which is stiffly spinous; the caudal seventeen. In the middle there is a continuation of scales quite to the end.

The bones supporting the gills are all furnished with patches of teeth next the throat. There are no small intestines; the space is short between the stomach and the colon, and to the latter are annexed

seven or eight appendices. The swimming vessel is very large, and distended with air. Toward the thorax it has two vermicular processes. The gall bladder is several inches long, and very green. The teeth, in the throat are not so hard, distinct, and pavement-like, as in the black drum. Processes of the vesica natatoria are received into holes or depressions on both sides of the back-bone, among the ribs, internally; and this also occurs in the other species. On the 15th of October I measured a fine individual that was three feet and six inches long. It affords excellent eating.

4. *Red Drum.* (*Sciaena gigas*.) With a ruddy or reddish complexion, and frequently weighing sixty pounds, or upward.

This is commonly considered a distinct species from the black drum; but, after much examination, I am not sure he is any thing more than a variety.

The difference is so difficult to assign, that I have heard men who pretended to be judges deliver opposite opinions on the very same parcel of fishes; one declaring them to be black drum; another affirming them to be red drum; and another again, saying that some were black, and others red.

With such doubts among the adepts, and such a coincidence of natural marks in all the individuals I have examined, there is every reason to conclude the complexion is merely the effect of age, or sex, or of some other cause operating upon the colours of fish. The rays of the fins, in a very large red drum taken alive from the water, were nearly as already enumerated for the *black drum*.

Generic character.

Teeth sharp, incurvate. Gill-covers triphyllous, scaly, serrated. Dorsal fin spiny on the forepart. Scales, in most species, hard and rough.

1. *Mitchill's Perch, Striped Bass, or Rock Fish.* (*Perca Mitchilli.*)
With eight parallel lines from head to tail.

One of the most large, distinguished, and excellent of the New-York fishes: may be found in the market of all sizes, from the weight of an ounce to that of seventy pounds, and upward.

The position of the ventral fins rather behind the pectoral, made me once incline to place him in the order of the abdominales. His second gill plate is finely serrated. That circumstance, if he remained among the thoracic, would rank him among the percæ. When I decided in favour of changing his order, I was obliged to constitute a new genus for him, which I called roccus. But having since found that there are fishes whose ventral fins are further back on the abdomen than this, that are, nevertheless, considered as thoracic, I have, on reconsideration, persuaded myself, it will be most correct to place him among his congeners of the perca family.

His middle gill-cover is nicely serrated, and the notches are largest at the angle. The posterior part of the third plate is armed by two spinous processes, which are partly concealed by the membrane that underlays them.

Two dorsal fins, the foremost of which is spinous, ramentose, and formed of eight rays.

Head rather elongated, and the lower jaw jutting beyond the upper.

Tail, as it appears to the eye in its contracted state, furcated; when expanded, lunated.

Upper lip and lower jaw furnished with minute and file-like teeth; the throat armed with patches of the same.

But one of the most obvious and distinguishing features of this fish, is the striped appearance of his body. From head to tail, his back and sides are marked by longitudinal lines. The ground colour is pale brown, whitish, or silvery. On this are delineated the aforesaid lines in parallel rows. These rows, at some seasons, appear black, and make a strong contrast. At other times they are more faint, and seem to be faded into a reddish brown. When the brown thus predominates, dark specks or spots can be traced at regular distances along the stripes, particularly toward the back.

The number of these stripes is usually eight; and four of them most commonly reach the tail. The rest are frequently shorter; vanishing unequally in their progress.

Belly a fine mixture of silvery and white. Scales adhere firmly.

Tongue distinct, with roughness at its root and near its edges.

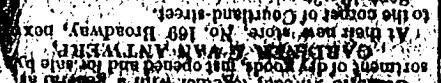
Lateral line straight, and when the colours are deep, not very apparent; but when they are more faint and faded, perceptible enough as it runs through and along the fourth or fifth stripe, and may be traced almost to the end of the caudal fin.

Eyes white. Mouth capacious. Gill-openings ample. Three first anal rays spinous.

Rays, Br. 7. P. 16. V. 6. D. 3—14. A. 15. C. 17.

This fish is very highly and justly prized by the New-Yorkers. He is savoury and excellent beyond the generality of fishes. His common abode is the salt water; but he migrates to the fresh streams and recesses to breed during the spring, and for shelter in winter.

He takes the hook, especially when baited with soft crab, greedily.

Small ones are caught by  and boats, everywhere near the city.

Their greatest run is late in the fall. Instead of going away on the approach of winter, the striped basse seeks refuge in bays, ponds, and recesses, where he may remain warm and quiet. Here the fishermen find him, and make great hauls during the coldest season, when very great numbers are brought to market in a frozen state. At this time it is usual to take some of the very large and heavy ones. Yet I have seen a dozen at a time of the weight of fifty pounds each, in the New-York market, early in October, while the weather was very mild.

He is also taken in seines during the summer, and in autumn. Indeed, there is no fish that stays more steadily with us, all the year round, than the rock; and he is found of all sizes, to suit all sorts of palates.

(a) *P. M. interrupta*. There is a variety of this fish, which consists chiefly in an irregularity of the side-lines. For here their parallelism is broken; and their integrant parts, the specks, and spots, resemble confused rows of printing types. I have seen this interruption among the stripes, between the gill-opening and dorsal fin. It also occurs among the rows below the lateral line, about the middle of the body; and occasionally in other parts.

(b) *P. M. alternata*. There is, in some individuals of this species, a further variety. This consists of a row of dots or spots, longitudinally, between each of the stripes, or lines; making alternate courses of spots and lines. This diversity occurs most commonly in the larger fish, and may be natural to them, though I have considered it as a variety, and do now note it so.

2. *Sea Basse*. (*Perca varia*.) With undivided tail, and speckled sides and fins.

Length fourteen inches; depth almost three. Weighs, when large,

from two to three pounds. Mouth wide, with free branchial openings. Both jaws are furnished with short and sharp teeth. Lower jaw rather projects. Tongue white and smooth.

Back considerably arched, and approaching to gibbous, especially in the male fish. The females have less of a bunch, but a more prominent belly. Body protected by firm, stout scales.

Colour speckled with black and white regularly from head to tail, the black predominating toward the back, and the white toward the belly. The dorsal, anal, and pectoral fins partake of the speckled or chequered appearance. Ventrals and caudal do not show the variegations so strongly. Is, when first taken, frequently tinged with green about the back and root of the dorsal fin; and a purple suffusion is not unfrequent.

From a point a little forward of the dorsal fin, a gradual slope to the nose. He is deep through from the bunch to the sternum; but becomes much more slender toward the tail. Upper gill-cover serrated. Lateral line corresponds with the back. The first ten dorsal rays spinous. Vent midway. Tail undivided. *Black herry, hannahills, and blue-fish*, are some of the names by which he is known.

Rays, Br. 7. P. 13. V. 6. D. 21. A. 11. C. 17.

Abundant in New-York, and is one of the most savoury fish at market. Taken most plentifully near Sandy-Hook, in the ocean; and even at the wharves of the city.

BODIANUS.

Generic character.

Habit of the genus perca. Gill-covers scaly, serrated, and aculeated. Scales, in most species, smooth.

1. *Silvery Perch.* (*Bodianus argyro-leucos.*) With white and silvery scales, and lateral line reaching to the end of the tail.

Eight inches long, and three deep. Gill-cover tripartite, with two or three spines, and many serræ on the edge of the middle plate. Back elevated, and belly prominent, so as to give him a plump appearance. Tail even. Head and jaws somewhat sloping, and faintly approaching a rostrated figure.

Mouth ample. Tongue conspicuous and smooth. Lips furnished with minute and sharp teeth, but none in the palate, tongue, or throat. Eyes rather large, and yellowish white. The whole complexion whitish. The white of the back relieved by pale brown scales, disposed in rows ascending toward the back, and thence inclining toward the tail.

Lateral line rather arched by running to the extremity of the tail. First ventral ray sharply spinous. All the first dorsal rays, and the two first rays of the second fin, spinous. Below the line, the sides and belly are alternated with shades of a silver white, and a milk white disposed into spaces and rows.

Ventral and anal fins yellow. Pectoral, caudal, and second dorsal, yellowish.

Rays, Br. 7. P. 15. V. 6. D. 11—12. C. 17.

2. *Middle Grunts.* (*Bodianus costatus.*) With cirrhous and cryptous lower jaw, green-spotted gill-cover, and sides covered with ribclouded specks.

Length eight inches and a half; depth two and a half. Head roundish and scaly. Middle plate of the tripartite gill-cover, both serrated and aculeated.

Lateral line runs to the extremity of the tail. Two dorsal fins, neither of which is properly spinous; and the first infringes upon the second. Mouth under, and gaping after death. Teeth, in the throat, above and below.

Colour pale brown on the back, with silvery sides, and white belly; variegated with lines of yellowish, blue, and green.

A dozen or more narrow faint clouds slant down the sides, looking almost like ribs. Five holes under the chin, among half a dozen very delicate cirrhi.

A greenish spot in the middle of the posterior gill plate. A dark spot at the origin of the pectoral fin. Ventral and anal fins yellowish. Has the ragged cirrheous appendage to the upper lip which the kingfish possesses; and also the two orifices near them. Has, indeed, very much the habit of the kingfish. Two first anal rays spinous; one short, the other long.

Rays, Br. 7. P. 17. V. 6. D. 10--29. A. 10. C. 17.

3. *Triple-tailed Perch.* (*Bodianus triourus.*) A fish brought, though not commonly, to the New-York market.

The specimen which I procured on the 23d of July, 1814, measured thirteen inches and a half in length, five in depth, not including the dorsal fin, and about one and a half in thickness. He is reported to grow much larger, so as even to weigh four or five pounds. The one before me was taken in a seine, on the Jersey shore, near Powles-Hook. He weighed twenty-seven ounces.

Snout rather elongated. A knob, or gibbosity in front of the dorsal fin. Eyes rather small, and of a purple or amethystine colour.

The tail is convex or rounded. The posterior rays of the dorsal and anal fins are so much lengthened and expanded, as to resemble caudal fins, and to give the fish somewhat of an appearance of three tails.

Gill-cover tripartite, and scaly. The posterior edge of the foremost lamina, strongly aculeated, and almost spinous. A bony plate, with a serrated edge behind the gill-opening. Another with a similar edge above the gill-opening.

Lips distinct. Mouth moderate. Lower jaw rather jutting, and acutely toothed. Upper jaw also armed with a row of sharp teeth. Tongue broad, and smooth, with clouded edges. A dark membrane of a semi-lunar form inside of the mouth, immediately within the teeth of the lower jaw. Near the extremity of this latter, four bronzy spots.

Lateral line bends upward, somewhat irregularly at first, and then proceeds with an easy slope to the tail. Scales form a firm coating.

The first eleven rays of the dorsal fin are spinous, and rather rametose. The first three anals are also spinous; and so likewise is the first ray of the ventral. This latter is stout and strong, while the pectoral fin looks delicate and weak.

The colour of the back and sides is a rusty black; of the belly, a dirty clay, variegated with blackish and yellowish specks. A dull yellow is very distinguishable behind the eyes, above the gill-covers, along the insertion of the dorsal fin, the commencement of the lateral line, and under the pectoral fins. The dorsal, anal, and ventral fins are a little tintured with yellowish, amid the inky suffusion. The pectoral fin is pale and semi-transparent, appearing very faintly yellow, when viewed by itself; but when lying close to the side, showing the yellow scales through it. The whitest part of the fish is immediately beneath the pectoral fin. Some of the fishermen call him *black grunts*.

Rays, Br. 6. P. 15. V. 6. D. 27. A. 13. C. 16.

4. *Pigmy Perch*. (*Bodianus exiguus*.) A very small species, taken among the shrimp, and scarcely larger than the most minute stickle-back. Length one inch; depth one-eighth of an inch.

For a fish of his size, the head and eyes are rather above proportion. The gill-covers are ample, and their openings wide.

The foremost gill plate is serrated and aculeated. Excepting the abdominal region, the body is generally semi-transparent, so that the vertebræ may be distinguished.

Mouth capacious, and inclined upward.

Two dorsal fins, the foremost of which is composed of stiffer rays than the hinder. The first anal ray is spinous.

If he is the young of some species, I am unable to determine what that species is.

Rays, Br. 4. P. 7. V. 7. D. 7—18. A. 10. C. 17.

5. *White Perch.* (*Bodianus pallidus.*) With soft and connected dorsal fins, pale back, and white sides.

Length eight inches; depth two and a half. Colour whitish, with a dark hue according to the angle of reflected light. Back pale. Belly silvery. Tail even. Lateral line extending through it.

Small teeth in the lips. Patches of them in the throat. Eyes large and pale. Nostrils double. Four or five holes under the chin, but no cirrhi.

Middle gill plate both jagged and thorny.

Head scaly. In some aspects the scales appear in the form of spotted rows, neither striped nor zoned. One short and one long spine to the anal fin. Ventrals and anal yellowish. Dorsals two, running into each other, and the foremost scarcely spinous.

Rays, Br. 6. P. 14. V. 6. D. 9—23. A. 12. C. 19.

6. *Red Perch.* (*Bodianus rufus.*) With three anal spines, first dorsal fin spinous and ramentose, and ruddy ventral and anal fins.

Length ten inches; depth three and a half; thickness about two; making him a thick and rather gibbous fish. I have seen them fourteen inches long, and near five deep, brought from Quag on Long-Island.

Middle gill-cover both serrated and moderately aculeated below. Head scaly, and rather elongated.

Jaws and throat armed with small teeth. Mouth and throat wide. Tail forked, or rather lunated. Body whitish, and speckled with rows of a kind of cream-colour and rusty brown. Lower fins and throat

ruddy. When the fish is not in the breeding season, the colours are browner and darker ; leading the people to call him the *bluck perch*.

Scales hard and strong. Lateral line rather crooked upward, and very plain. Three foremost of the anal fins spinous. First dorsal fin spinous and ramentose. Is one of our most firm and savoury fish.

Rays, Br. 6. P. 15. V. 5. D. 9—13. A. 14. C. 17.

7. *Yellow Perch*. (*Bodianus flavescens*.) With serrated bones on the thorax, scarlet ventral and anal fins, and brownish zones on the sides.

A beautiful fresh-water fish, of a foot or more in length, and three inches in depth.

Head rather small, and tapering toward the snout. Both jaws roughened with very small teeth. Eyes large and yellowish.

Body deep and thick, but becoming slender toward the tail. Scales rather hard and rough. Lateral line almost straight. Tail rather concave. First ventral ray spinous ; as are also the two first anal rays, all the rays of the foremost dorsal fin, and the first of the second dorsal.

Colours brown or olive on the back, turning to yellow on the sides, and white on the belly. Faint brown zones to the number of four or more diversifying the sides from back to belly. Dorsal and pectoral fins brown. Ventral and anal scarlet.

Gill-covers tripartite. Lower and hinder edges of the foremost acutely serrated. Middle one serrated at the lower edge, and streaked radially on the broad side. One serrated bone on the thorax immediately above the pectoral fin, at the posterior margin of the branchial opening ; and two other bones with serrated edges above the first, near the upper part of the branchial opening.

In the year 1790, I transported about three dozens of these yellow perch from Rockankama pond, in Suffolk county, to Success Pond, in Queens. The distance is about forty miles. Before that time Success Pond contained no yellow perch. Since that time, there have been

as many of them as could subsist. My assistant in this undertaking was my uncle, Uriah Mitchill, Esq. high sheriff of Queens county. We filled a very large churn with the water of Rockankama pond. We put so few perch into it that there was no necessity for changing it on the road. We were in a wagon, and came the whole distance on a walk, without stopping to refresh either man or horse. The project of transporting the fish to Success Pond was completely answered; and in this way was the yellow perch carried to the Hempstead waters. (See *Medical Repository*, vol. 3. p. 422.)

Rays, P. 14. V. 5. D. 12—14. A. 10. C. 19.

SCOMBER. MACKEREL.

Generic character.

Body oblong, smooth, sometimes carinated by the lateral line. Small or spurious fins, (finlets,) in most species, above and below, toward the tail.

1. *Thimble eyed, bull eyed, or chub mackerel.* (*Scomber grex*.)

Length about ten inches. Body round and tapering away. Lateral line crooked. Back marked with meandering lines of pale and dark green.

Colour, near the lateral line, of a somewhat lighter green and less mottled. The rest of the surface, a pigeon's-neck hue, variegated and changeable like one of copper.

Five finlets above, and as many below. First anal ray spinous. Comes occasionally in prodigious numbers to the coast of New-York, in autumn. This was memorably the case in 1781 and 1813, when the

bays, creeks, and coves were literally alive with them, and the markets full of them.

Rays, Br. 5. P. 19. D. 9—12. A. 13. C. 23.

2. *Spring Mackerel*. (*Scomber vernalis*.) With longitudinal spurious fins on the sides of the tail, and smutty patches near the pectoral and ventral fins.

A very elegant fish, of sixteen or seventeen inches long, and three deep. Form round and tapering. Back marked by deep blue parallel curved transverse bands, reaching below the lateral lines on each side. The intervening spaces are of a paler blue and reddish brown. Head bluish, with dark spots and marks. Shades of green intermixed. Belly silvery white and iridescent. Hues beautifully changeable. Tail deeply forked, or almost lunated; and branching so wide that it measures four inches across from the upper to the lower extremity of the caudal fin. A spine before the first anal ray.

The strongest rays proceed from the superior and inferior sides of the tail, and not from the middle. Between the insertions of the caudal rays, on each side of the tail, are two longitudinal spurious fins, half an inch in continuance, with small scales in the interjacent spaces.

Five finlets on the tail above and below. A smutty patch frequently on the upper parts of the ventral fins; and the like behind the pectorals.

A smoke-coloured streak or cloud obscuring the brilliancy of the sides between the pectoral fin and the tail.

Eyes large, with a transparent nictitating cover. Lower jaw serrated.

Lateral line corresponds with the back, and is not scaly; though it may be distinguished and traced by the finger.

Is caught off Sandy-Hook in great numbers with the hook, and brought in abundance to the New-York market.

Rays, Br. 6. P. 17. V. 5. D. 10—11. A. 12. C. 20.

3. *Horse Mackerel*. (*Scomber plumbeus*.) With approximated ventral fins, uniform leaden colour, variegated with greenish, and no finlets.

A well-formed fish of about thirteen inches long, when grown, and three inches deep; weight nearly a pound, or about fourteen ounces.

Mouth large. Gape wide. Lower jaw jutting beyond the upper, and yet the lower teeth shutting within the upper. When the jaws are closed, the upper teeth lap over the margin of the lower jaw. Eyes large and yellowish white.

Gill-covers smooth. Openings ample. Tail deeply forked. No finlets or spurious fins. Colour of the head and body such that they often call him *blue-fish*; it being of an ash, leaden, or dove, verging toward white about the neck and belly, and interspersed faintly with red or carnation. On the head and back shades of green, and sometimes of blue, by nice inspection.

Jaws sharply toothed. Palate roughened with a patch of small teeth on each side. Tongue smooth. A plenty of small and delicate scales on the skin. Inky spots sometimes behind the pectoral fins, or rather at their insertions. Two dorsal fins, whereof the first is faintly spinous, and sinks into a furrow.

Lateral line curved gently upward, and a longitudinal indentation often perceptible below it. Ventral fins approximated at their base.

Rays, Br. 7. P. 17. V. 6. D. 7-26. A. 26. C. 19.

Is one of our most savoury fish; and the young ones are taken plentifully with the hook at our wharves, by the boys, in August.

4. *Pilot Fish*. (*Scomber ductor*.) With silvery blue skin, diversified by four transverse blue bands, four dorsal spines, and tail barred with black.

The companion of the shark, and well known already.

5. *Yellow Mackerel*. (*Scomber crysos*.)

Length six inches and a half; depth two. A neat, compact, hand-

fish, about three quarters of an inch thick. He is plump and smooth generally. Back forms a neat regular curve. Belly an apposite corresponding sweep. Head neither rostrated nor blunt. Tail very slender, and ending in a fin deeply forked. A marine fish, taken in the bay of New-York.

Lateral line bends upward about the thorax; then turns downward and runs straight to the middle of the tail. Soon after its curvature it becomes mailed and spinous. The spines are short, and directed backward. They are sharper and larger, and their bases wider as they approach the tail. Thus the line itself widens in its course backward.

Mouth moderate. Lower jaw rather thin and small. Teeth minute, and may be said to be rather adapted to hold fast than to bite. Eyes yellow, and rather large. A black spot frequently at the edge of the gill-cover.

Two dorsal fins, the foremost of which is spinous, and occupies but little space. In front of it, a spine pointing forward. The hinder dorsal filamentous, and continued almost to the tail. Two spines just behind the vent, and from them the ventral fin extends also almost to the caudal. A bony ridge reaching from the upper part of the nose to the first spine of the back.

Pectoral fins pointed; ventrals small.

Colour of the back greenish blue, with a yellow suffusion. Yellow gilds the gill-covers, sides, and belly. The same golden hue also tinges the second dorsal, caudal, anal, pectoral, and ventral fins, in varying shades. The chin and gill-covers are whitened a little, and white likewise appears a little along the belly. Tongue yellow, and rather rough.

Scales few, and easily deciduous. No zones, stripes, or spots any-

where about him ; nor any spurious fins. But a sort of second lateral line near the roots of the dorsal fins, on each side of the back.

Rays, Br. 7. D. 8—24. A. 19. P. 18. V. 4. C. 18.

6. *Spanish Mackerel*. (*Scomber maculatus*.)

Length nineteen inches ; depth three and a half ; thickness rather more than two. Girth about eight ; so that a section of his body is elliptical. Weight twenty-seven ounces. A fine and beautiful fish. Comes in July.

Snout pointed. Gape wide. Jaws close accurately, but in such a manner that the lower is bigger, and seems longer, than the upper. The former is rather blunt, while the latter is sharper.

Tail spreads into a broad fork, or widens almost to a crescent, which is so large that the extremities of the caudal fin are six inches apart.

Margin of the enormous mouth armed with distinct and cuspidated teeth ; excepting the front of both jaws, where they are scarcely perceptible, or are quite wanting.

Tongue small. Gill-openings ample. Eyes large and yellowish bright. Nostrils near them forward, and double.

Ridge of the back from head to tail greenish. Rest of the back leaden or dove-coloured. Chin, neck, gill-covers, sides, and belly, a resplendent white. Ventral, anal, and spurious lower fins, exhibit a whiteness scarcely less brilliant.

About twenty yellowish spots, some of them a quarter of an inch in diameter, decorate the sides, and impart to them a gay appearance. They are distributed about without any regard to rows.

Lateral line contrasts with the continuous skin, by being scaly. Commences above the gill-opening, and at first rises a little. Then it descends through and among the spots, touching occasionally some of them, and dividing others. It does not travel straight, but crooks and meanders along prettily toward the tail.

Eight finlets above, and as many below. Two dorsal fins, with a small spine between them.

The forepart of the first dorsal, making more than half of it, is black ; the remainder white.

Second dorsal fin and finlets, and caudal, brown.

Pectoral fin acuminated ; and brown on the outside, and black within.

A spurious finlet in the course of the lateral line, and near its posterior extremity. Two others somewhat curved, between the former and the caudal fin ; one above and the other below. Skin near them greenish.

Ventral fins small, and a kind of spurious fin between them.

Rays, Br. 5. V. 4. P. 20. D. 17—16. A. 18. C. 24.

7. *Banded Mackerel*. (*Scomber zonatus*.) With brown bands down the sides, and white tips to the fins.

Taken in the bay of New-York, occasionally, during the warm season. One that was taken at a city wharf, on the 26th of August, 1814, was seven inches and a half long, rather more than two deep, and somewhat above one in thickness. I have known one of nine inches long, that weighed rather more than half a pound.

Colour of the back an elegant greenish blue ; sides paler ; belly almost white. Perpendicular brown bands on the sides, to the number, usually, of six, from a quarter to half an inch wide. The foremost includes the pectoral fins. Body covered with very small scales.

From the eyes runs a crescent, reaching almost to the foremost dorsal fin.

Tail deeply forked and yellow ; the upper and lower extremities neatly tipped with white. Anal rays yellowish, and their extremities fringed prettily with white. Dorsals brown, and the summits of the foremost four or five rays of the second dorsal fin likewise whitened.

Has two dorsal fins, the foremost of which is feebly spinous. The

anal and second dorsal are entire, and without finlets. The general form and aspect are those of the scomber plumbeus. Yet the lower jaw is shorter than the upper, and shuts within it. Both jaws are furnished with sharp but minute teeth. Through the middle of the tongue runs a longitudinal toothed stripe.

Eyes moderate and yellowish. Skin smooth and scaleless. Lateral line plain to be seen, but not very evident to the touch, until it approaches the tail. After bending upward at the thorax, it runs almost straight to the tail, where it makes a slightly projecting lamina. Ventral fins large. Their rays, especially the inner ones, much branched. Their upper sides black; the lower white, with a shade of yellow.

Rays, Br. 6. P. 22. V. 5. D. 7---37. A. 22. C. 23.

These marks are most evident in the younger fish. When they are older, they are not so distinct. In the full-grown individual, the brown bands of the sides, and the white tips of the fins, are more faint; but they are highly beautiful in a small fish of the species, swimming in his element.

In some there is a yellowish stripe or riband running straight from the upper part of the gill-opening backward. The lateral line, in the old fish, is sensibly raised toward the tail. In these the yellowish colour is less distinct in the fins; and the crescent over the head is more faint. There is often an appearance of a large membrane behind the front teeth, in the upper jaw.

8. *Bonetta*. (*Scomber sarda*.) With a patch of minute scales reaching from the back of the neck to the thorax behind the pectoral fin; a leaden complexion; cloudy streaks extending obliquely toward the back; and dusky zones descending directly toward the belly.

Length of the specimen before me twelve inches; depth two and three quarters; girth almost six. The figure of the fish being cylindrically round, like many other sorts of mackerel, but tapering away toward the head and tail.

The belly is ash coloured, the back dove or lead coloured. From the sides, six or seven darker lines, about an eighth of an inch broad, slope upward to the back, and about ten or a dozen bands nearly half an inch broad, of a fainter hue, diversify the sides transversely from head to tail.

The jaws are almost even ; though, correctly speaking, the lower is rather shorter, and shuts fairly within the upper. The teeth are sharp and distinct. There is a single row of them on each side of the palate extending toward the throat, which Dr. Bloch mentions as a great peculiarity.

The skin generally is smooth and silky ; but patches of minute scales are found between the nape of the neck and the rear of the pectoral fins ; and sometimes at the pectoral and caudal.

There are eight spurious fins on the upper side of the tail, and seven below. There are two dorsal fins, of which the foremost has twenty rays, and the hindmost fourteen. The tail is forked, or almost lunated, with three longitudinal fin-like excrescences on each side.

The eyes are large, and the irides yellowish. The nostrils are double, and the openings a quarter of an inch apart. The holes nearest the nose are round and small ; those next the eyes resemble long and narrow vertical slits.

The lateral line waves prettily along in its course. The leaden colour is most distinct on the head and gill-covers.

The pectoral fin is rather short, and contains twenty-four rays ; the ventral smaller, and has six ; the anal fourteen ; and the caudal twenty-four, with some imperfect ones.

Generic character.

Body somewhat lengthened. Dorsal spines distinct. Ventral fins spiny. Abdomen carinated, or shielded on the sides, and bony beneath.

1. *Two-spined Stickleback*. (*Gasterosteus biaculeatus*.) With two spines in front of the dorsal fin.

The smallest of our fishes, scarcely more than an inch in length; and known by the two thorny processes on the back, forward of the dorsal fin. Seems to be the species described by Shaw; and, what is remarkable, the only one that I remember for which he has given credit to the waters of New-York. Caught in the salt water among the killifishes.

2. *Four-spined Stickleback*. (*Gasterosteus quadricus*.) With four spines in front of the dorsal fin.

In front of the dorsal fin four spinous processes irregularly situated. Two similar spines in lieu of ventral fins. Connected with these on each side a lateral spine reaching almost as far back as the vent. The three foremost of the dorsal spines stiff; and the hinder one moveable. Found, like the preceding, in the salt water among the killifishes.

Rays, Br. 3. P. 13. D. 12. A. 11. C. 13.

TRIGLA. GURNARD.

Generic character.

Head large, mailed, and marked by rough lines. Gill-covers spiny. Gill membrane seven rayed. Finger-shaped processes, in most species, near the pectoral fins.

1. *Gurnard, or Sea Robin*. (*Trigla lineata*.) With a line from head to tail along and below the lateral line.

Length eighteen inches. Head broad and squarish. Four spinous processes on the head-piece ; two at the eyebrows, and two others at some distance behind the eyes. A spine on each side of the thorax above the pectoral fin. The rough gill-covers have each two strong spines, directed backward, one on the middle, and the other on the hinder plate. Beside these ten points, there are several other projections, not quite amounting to spines.

Eyes vertical, and yellowish white. Two dorsal fins, the foremost of which is spinous, and sinks into a furrow. Three of its rays serrated. Body beset with small adhesive scales, and tapering away toward the tail.

Colour of the head, back, and sides, dirty brown of different shades, darker above, and lighter beneath. Belly cream coloured, with reddish tinges, and rusty marks. Lateral line strongly distinguishable by its prominence and higher colour. Below it a coloured stripe more inclined to reddish, and, as it approaches the tail, interrupted so as to form a row of spots. Skin near them suffused with ruddy. Some rusty spots between the two lines. Between the lower line and the belly a course of brown and reddish spots.

Three digitated processes in front of each pectoral fin. Pectorals large and long, reaching two thirds of the distance to the tail, with dark brown and reddish narrow lines across.

First dorsal has an irregular inky patch. Anal fin reddish, with a brown spot at the insertion of each ray. Caudal reddish.

Rays, Br. 7. P. 13. V. 6. D. 9—12. A. 12. C. 17.

2. *Web-fingered Gurnard.* (*Trigla palmipes.*) With bright yellow fringes on the fingers.

Length eighteen inches, and more. Head mailed and rough, even to the rim of the jaws. Middle plate of the gill-cover has a strong spine pointing backward. Posterior plate divided behind into two sharp prongs. A soft layer and rim of skin behind them. A broad scale on

each side of the thorax, ending in a thorny process. A hard scale extending backward from each eye, and ending rather bluntly between the gill-opening and foremost dorsal fin.

Back brown, interspersed with ochreous, reddish, and yellowish. Lateral line rough, and strongly marked at its commencement near the nape of the neck, and becoming more faint as it proceeds, until it is rather indistinct near the tail. Belly, from the neck to the vent, white; and remarkably so behind the fingers and fins. Behind the vent colour whitish, with shades of yellowish and reddish.

Two dorsal fins, the first of which is spinous, and lodged in a groove.

Three bright yellow fingers on each side from one and a half to two, and a quarter inches long, curved, expanded, and webbed toward their extremities.

Pectoral fins four inches long, and scolloped between the points of the rays. They are of a roundish shape. Their outside irregularly purplish brown and yellow. Their inside faintly bluish with dusky. White above, as far as the third ray. Ventrals white, with yellowish rays on the upper side. Dorsals brown, with intermixture of yellow. Tail darker, especially at the extremity, with stripes of yellowish between the rays. Anal dirty yellow. Scales moderate, and firmly adherent.

Rays, Br. 6. P. 14. V. 6. D. 9—14. A. 16. C. 15.

Order, ABDOMINALES.

SILURUS. CATFISH.

Generic character.

Head large, depressed. Mouth wide, bearded by long tentacula. Body lengthened, naked. First of the pectoral fins, or of the first dorsal fin, toothed backward.

1. *Common fresh-water Catfish.* (*Silurus catus.*) With the hinder dorsal fin adipose, twenty rays in the anal fin, and eight beards.

Has eight cirrhi: two large ones from his mouth like whiskers, two on the upper jaw above and behind them, and four depending from the chin.

Head and body mucous, without scales. First rays of the pectoral fins spinous, with a reversed serrated edge behind. Two bony spines connected with them, and projecting backward, so as to show their points on each side of the body at the skin.

First ray of the first dorsal fin spinous. Second dorsal fleshy. Anal fin has twenty rays.

Rays, Br. 7. P. 8. V. 8. D. 7.—2d fleshy, A. 20. C. 21.

2. *Salt-water Catfish.* (*Silurus marinus.*)

A splendid fish, twenty inches long; four inches deep; and three and a half wide. Taken June 30th, 1814.

Two whiskers, between five and six inches long, projecting from the upper lip, near the corners of the mouth.

Two cirrhi, near one inch and a half long, depending from the chin.

A bony ray in front of the first dorsal fin two inches and a half long; a cartilage spliced to it, as it were, and continued two and a half inches longer, making together a dorsal projection five inches long.

First rays of each pectoral fin bony, with reversed spines behind, and about three inches long; from which a cartilage is continued about three inches; making together six inches.

Both the dorsal and pectoral bony rays are notched in front, but not serrated enough to hold fast or to scratch.

The several cartilaginous continuations are smooth on the anterior part; but have the appearance of serræ on the posterior edge. Yet these serræ are invested in a membrane which shelters them from the touch.

Two dorsal fins, the foremost of which is pretty far forward, and consists of eight rays. The hindmost pretty far back, and adipose without rays. The distance between them six inches.

Tail deeply forked; the extreme rays somewhat converging; nevertheless the distance between them exceeds four inches.

Skin has a silky softness. Back glossy blue, with clouds and streaks of green. Lateral line almost straight. Below that the colour is white, down to the belly, which is a milk white. Is an exquisite fish for eating.

Ventral fins far back. They are inclined somewhat to red. Dorsal and pectoral fins have more of the ruddy; and the anal and pelvic most of all.

Rays, Br. 4. P. 13. D. 8.---2d fleshy. V. 6. A. 22. C. 19.

SALMO. SALMON.

Generic character.

Head smooth, compressed. Tongue cartilaginous. Teeth both in the jaws and on the tongue. Gill membrane from four to ten rayed. Body compressed, furnished at the hind part with an adipose fin.

1. *Common Salmon.* (*Salmo salar.*) Of a silvery gray colour, with spots, and in the male, incurvated jaws.

Has been taken, since the discovery, a few times in the Hudson. But here he is a straggling fish, and not in his regular home. There is no steady migration of salmon to this river. Though pains has been taken to cherish the breed, salmon has never frequented the Hudson in any other manner than as a stray. The supply to the New-York market usually came from Connecticut river; but since dams and impediments have kept the salmon away from their customary places of resort in that stream, they have been brought from the Kennebec, covered in ice. Their season is the middle of May, or beginning of June.

2. *Smelt.* (*Salmo eperlanus.*) Bluish silvery salmon, with transparent head, and seventeen rays in the anal fin.

This fish is occasionally brought to the New-York market; but he is not a steady visitor. I have eaten him in fine style at Newark, whether he was brought from the Passaic river.

3. *Common Trout.* (*Salmo fontinalis.*) With yellow and red spots on both sides of the lateral line, concave tail, and sides of the belly orange red.

Back mottled pale and brown. Sides dark brown, with yellow and red spots; the yellow larger than the red, and surrounding them. The latter appear like scarlet dots. Lateral line straight. The yellow spots and red dots both above and below that line. Sides of the belly orange red. Lowest part of the abdomen whitish, with a smutty tinge. First rays of the pectoral, ventral, and anal fins white, the second black, the rest purplish red. Dorsal fin mottled of yellowish and black.

Tail rather concave, but not amounting to a fork; and of a reddish purple, with blackish spots above and below.

Eyes large and pale. Mouth wide. Teeth sharp. Tongue distinct. Skin scaleless.

Is reckoned a most dainty fish. They travel away to Hemp-
Islip, for the pleasure of catching and eating him. He is bought
extravagant price of a quarter of a dollar for a single fish not more
ten or twelve inches long. He lives in running waters only, and not
stagnant ponds; and, therefore, the lively streams, descending north
and south from their sources on Long-Island, exactly suit the constitu-
tion of this fish. The heaviest Long-Island trout that I have heard of
weighed four pounds and a half.

Rays, Br. 10. P. 12. V. 7. D. 13 and O. A. 11. C. 23.

I copy the following article from the news-papers:

“Mr. Robbins, of the Philadelphia theatre, visited Long-Island (New-
York State) in the summer of 1814; during his stay in that place,
caught *one hundred and ninety fresh-water trout*, weighing as follows, viz.

		Trout.	lbs. oz.
Sept. 6th,	caught at Nichols'	14 weighing	
8th,	at Patchoque,	9	7 8
9th,	do.	21	10 8
10th,	do.	78	26 0
12th,	do.	5	5 0
13th,	do.	4	5 8
15th,	at Fireplace,	1	3 0
16th,	do.	16	16 8
17th,	do.	9	3 0
19th,	at Patchoque,	23	47 0
20th,	do.	6	7 8
21st,	do.	4	8 3
Days	12	Fish 190	lbs. 139 11

“The largest fish caught at Patchoque, weighed two pounds and eight
ounces; and the largest at Fireplace, three pounds.

“Dr. Post, of New-York, caught one hundred and fifty trout, weigh-

ing one hundred and five pounds, in the month of April, 1814, in the waters of Long-Island.

"Mr. Purvis, of New-York, caught a trout weighing four pounds eight ounces, measuring twenty-four inches in length. A drawing of this fish remains at Fireplace, near where it was caught."

FISTULARIA. PIPE-FISH.

Generic character.

Snout cylindric. Mouth terminal. Body lengthened. Gill membrane seven rayed.

1. *New-York Trumpet Fish.* (*Fistularia neo-eboracensis.*) With lower jaw jutting beyond the upper, with approximated eye orbits, and with the lateral lines almost touching the ridge of the back; a little behind the pectoral fins.

The specimen now before me is fourteen inches long, and very slender. Of these the snout measures more than two inches and a half; and a slender cartilaginous or horny continuation of the tail, about four inches.

The mouth is terminal, with a projecting lower jaw. The rostrum is grooved or fluted on the sides. Eyes large, orange coloured, and vertical. Their orbits very near to each other.

Body soft, smooth, and scaleless, with somewhat of semi-transparency. Shape roundish, and of that form (*plagioplateus*) whose transverse diameter is greater than the perpendicular. Colour brown on the back; with a dotted lateral line, and a row of pale spots on each side. Belly white in the middle, and semi-diaphanous on the right and left. Though the gill-openings are ordinarily closed, they, on examination, are wide and capacious enough.

The abdominal fins are small, and wide apart. The dorsal and anal fins are far back and opposite, like those of the pike. The tail is forked, and from its middle proceeds a single ray, of a black hue, four inches long, filamentous like whale bone, or capillary like horse hair. The orbits of the eyes are beset with angular processes. The pectoral fins are inserted at the thinnest part of the body, and are themselves broad and pretty large. There is a radiated patch on the gill-cover almost resembling a pectoral fin.

The lateral lines are very peculiar in this respect, that, arising from points somewhat forward of the upper gill-openings, they almost touch the dorsal ridge by finely approaching curves, and then recede to the usual distance on their respective sides.

The fins generally, but more especially the dorsal, anal, and caudal, have a pale and whitish appearance.

2. *Indian Trumpet Fish. (Fistularia chinensis.)* With scaly yellowish red skin, longitudinal rows of black spots, and simple rounded tail.

The specimen before me is about eighteen inches long, and was brought by a ship-master from New-Holland.

The appearance of the skin puts me in mind of the texture of a raw-silk stocking. Colour of a yellowish brown, with a ruddy tinge. On each side of the back two close rows, and one more remote, of blackish spots running lengthwise. Another row along the middle of the belly. Several pale or whitish stripes along the sides. Snout about four inches long, with a semi-transparent appearance, and mouth near the end. The creature is described by Shaw, in his *General Zoölogy*, vol. 5, part 1. p. 97, 98.

Generic character.

Head somewhat flattened above. Mouth, in most species, wide. Teeth, generally, sharp in the jaws, palate, and tongue. Body lengthened. Dorsal and anal fin, usually, placed near the tail, and opposite to each other.

1. *New-York Gudgeon.* (*Esox flavulus.*) With stripes lengthwise on the body, and transverse ones on the tail.

A pretty little fish, of five or six inches long, and an inch and a quarter deep.

Head and neck somewhat flat. Back broad. Figure chubby. Mouth small and scarcely toothed. Lower jaw longer and broader than the upper. Tongue distinct. Gill-covers large, and openings ample.

Colour of the back a yellowish brown; sides pale yellow; belly yellowish white. Two or more black stripes on the sides longitudinally, occasionally bent, broken, inclined, or interrupted. Near the tail two or more lines at right angles with the former, and sometimes crossing their extremities.

Dorsal and anal fins far back, and opposite. The thick round body firmly covered with adhering scales. Lateral line obscure.

Rays, Br. 5. P. 18. V. 5. D. 15. C. 25. A. 11.

(a) *Var.* There is a variety of this species, in which the longitudinal black stripes are wholly wanting; and where the transverse or perpendicular lines, sometimes to the number of twenty, mark the sides of the fish from head to tail; giving him an appearance which has been mistaken for that of the *yellow-bellied killifish*, to be soon described.

(b) *Var.* With continued lines alternated with dotted lines.

(c) *Var.* With a horizontal line above, and interrupted slanting lines below it.

2. *Pickereel.* (*Esox lucius.*) With blunt nose, lower jaw somewhat longer, greenish yellow sides, and streaks of pale brown.

A variety of *E. lucius*, measuring twenty-two inches long, by five deep; though he often grows much larger.

Head long, grooved, and flattish. Nostrils double. Upper jaw resembling, in some degree, the bill of a duck. Lower jaw rather longer, and turning up a little at the end.

Mouth and throat very wide. Gill-openings ample. Tongue moderate and loose; its extremity bifid, and its middle roughened with small teeth. Lower jaw armed with sharp teeth of different lengths and sizes. Palate beset with three patches of teeth arranged lengthwise. The teeth in all these patches moveable one way, like those of cards. They yield to any substance entering the mouth and throat, but rise and make resistance to every thing withdrawn from the mouth. Teeth of the outer patches inclining obliquely inward.

Dorsal and anal fins far back, and opposite to each other. Body stout and thick. Back rather flat, with a longitudinal groove. Lateral line straight, though not easy to trace.

Colour of the back dark brown. Gill-covers and sides greenish yellow, with mottled streaks of paler brown. Gill membrane and pectoral fins reddish. Anal brown, inclining to ruddy. Dorsal and caudal brown. Belly whitish red, or carnation. Tail forked.

Rays, Br. 15. P. 12. V. 9. D. 16. A. 14. C. 21.

Inhabits fresh waters; the brooks and ponds of Long-Island.

3. *Yellow-bellied Killifish.* (*Esox pisciculus.*) With faintly zoned sides, and yellow belly.

Length four inches; depth one. Head broad, thick, and flattish. Eyes on the sides, and far apart. Firm covering of scales. Lower

Jaw rather jutting. Gape not very large, but its cavity ample. Gill-openings free. Eyes yellowish.

Anal and dorsal fins opposite. Tail broad and even. Belly yellow. Sides marked by parallel pale or yellowish narrow zones, to the number of ten or a dozen, through the greenish or olive of the back and sides.

Ventral and anal fins yellowish. The rest pale brown. Jaws have a set of sharp little teeth. Lateral line obscure.

Frequents the salt tide waters.

Rays, Br. 5. P. 15. V. 6. D. 12. A. 11. C. 27.

4. *White-bellied Killifish. (Esox pisculentus.)* With uniform sides, and white belly.

Four inches long, and one deep. Head thick, flat, smooth, and chubby. Under jaw rather longer. Tongue plain. Irides yellow. Mouth moderate, and armed with very small acute teeth. Gill-opening considerably wide.

Body covered with firm scales. Dorsal and anal fins directly opposed. Tail wide, strong, and even at the end. Back olive or pale brown. Sides paler. Belly white. Lateral line indistinct.

Follows the ebb and flood of the sea water, in company with the preceding species.

Rays, Br. 5. P. 15. V. 6. D. 13. A. 11. C. 27.

5. *Sheep's-Head Killifish. (Esox ovinus.)* With a short, chubby body, mottled sides, and a semi-transparent extremity of the tail supporting the caudal rays.

Length about an inch and a half; and remarkably large in the girth. Lives in the salt water, after the manner of other small fishes of the same family; but is more rare than the other sorts.

Figure thick and deep at the thoracic and abdominal parts. Head flat and somewhat elongated. Mouth capable of considerable elongation and distention. Tail broad, and semi-transparent at the end.

ing the appearance of a piece or strip of a different kind, added to the main body.

Colour pale, generally, with white belly, and silvery gill-covers. A few faint traces of lines lengthwise; and brownish mottles or marks, not quite amounting to bands or zones, distinguishing the sides perpendicularly.

Eyes moderate, lateral, and yellowish. Brows distinct and prominent. Body coated, with firm and adherent scales. Ventral fins small, and far back on the abdomen.

A row of sharp little teeth in each jaw; and the mouth, which is ordinarily small and contracted, may be dilated to a gape of considerable width.

Lateral line plain and straight.

The dorsal and anal fins are not in such regular opposition as in the other species; the former being nearer the middle of the back, and the latter immediately behind the vent.

Rays, Br. 6. V. 7. P. 11. D. 11. A. 9. C. 17.

6. *Trout Pike*. (*Esox salmoneus*.) With two dorsal fins, the hindmost of which is rayless and adipose, eel-shaped body, forked tail, and lower jaw shorter than the upper.

Length eight or nine inches, and figured somewhat like the eel, tapering away from the middle toward the head and tail. Caught in the bay of New-York.

Head flat. Snout pointed. Eyes lateral, large, rounded, and pale.

Mouth wide, and furnished with small, distinct, and sharp teeth, along the margin of the jaws, and on the tongue and palate. The lower jaw is shorter than the upper, and shuts within it in such a manner that the superior teeth have a grinning appearance. Gill-covers very large, and their openings ample.

Body well coated with scales. Colour brown, with specks of dirty

white, and dark brown interspersed. Belly a dull white. Gill membrane yellowish. Lateral line distinct, and nearly straight. Fins brown, except the ventral, which are yellowish, and the rays incurved toward each other.

Two dorsal fins, of which the foremost is about the middle of the back, and consists of twelve rays; and the hinder is near the tail, small, membranous, or adipose. Under the latter is the anal fin, which is composed of twelve rays. The branchial membrane has thirteen rays.

Rays, Br. 13. V. 7. P. 14. D. 12—0. A. 12. C. 19.

7. *Banded Killifish*. (*Esox zonatus*.) With a white belly, flat head, and a dozen or more transverse marks down the sides.

A very delicate fish, scarcely more than an inch long; inhabiting the salt water, as the other species do.

Belly white; back brown; and sides marked by about twelve perpendicular blackish and nearly equi-distant bars. Body semi-transparent.

Head flat, broad, and tapering wedgewise to the neck below. Eyes on the sides, large, and faintly yellowish. Brows at the extremities of the crown. Lower jaw longer.

One dorsal fin situated toward the tail. One anal opposite to it. Ventral fins far back. Skin well protected by scales. Caudal fin broad, and rather convex.

Mouth rather small; but capable of such elongation as to appear almost rostrated. Teeth very minute.

8. *Bill-fish*. (*Esox belone*.) Blue green above, silvery beneath, and very long toothed jaws.

Is nearly twenty-four inches long, and one and a half deep; being cylindrical and slender.

Mouth rostrated, with rows of acute teeth in both jaws. The distance from the angle of the mouth to the tip of the lower jaw four inches and a half. Eyes large, with a mixture of silvery and dark.

Body round cylindrically, and the belly somewhat flattened. Two longitudinal, smooth, and parallel ridges extend along the back to the dorsal fin.

A carinated line on each side of the belly, running from neck to tail, rising over the ventral fin; and at the extremity of the anal bending upward, so as to enter the caudal midway.

Colour of the back a fine green. At the sides of it, lines of beautiful blue, bordering upon purple. Sides and belly a splendid white. A smutty patch on each side of the gill-covers, as if made by a bruise in lifting or pinching him with the finger.

Vent very far back, and about two inches and a half behind the ventral fins. Throat wide and greenish. Upper mandible articulated moveably to the head. Nostrils large, and of a bright green. He is a good fish to eat; and his bones turn green by cooking.

In an individual which I dissected, a full-grown *esox pisciculus* was found half digested in his stomach. The alimentary canal is without convolutions; the intestine proceeding straight through.

In other respects, this fish corresponds sufficiently well with the modern descriptions. An exclusive inhabitant of the salt water.

Rays, Br. 14. P. 12. D. 15. V. 6. A. 18. C. 19.

9. *Bony-scaled Pike.* (*Esox osseus*.) With square scales of a bony hardness covering the skin with mail, a long rostrated and toothed bill, and eyes placed far forward.

A few years ago I had a large and complete specimen from Long-Island, which agreed, in the main, with the descriptions extant. A specimen that I examined in Scudder's Museum, is about three feet long.

Generic character.

on the 13th Oct. 1920, I measured another specimen of this rare fish, about eighteen inches long. The tail like that of the other deeply forked; the scales silvery white; and the body resembling that of a Salmon. There was no vestige of an adipose fin; and the branchial membrane had thirty four rays. I could not discover the fine teeth mentioned in the generic description. —

ATHERINA. Atherine.

Generic character.

Head somewhat flattened over the upper jaw. Gill membrane six rayed. Body marked by a silver lateral stripe.

1. *Large Silverside.* (*Atherina mordax*.) With wide mouth, sharp-toothed jaws, the lower one longer; second dorsal fin fleshy.

Seven inches long, and rather more than one deep.

Mouth very wide and capacious. Tongue distinct, though small.

Jaws, tongue, and palate, armed with sharp and separate teeth, making a formidable apparatus for a small fish. Lower jaw longer than the upper.

A white satin-coloured riband from head to tail, along the broad side. Below that stripe, the belly silvery bright. Above it, the back of a semi-transparent paleness.

Eyes large, with silvery irides. Tail forked. Two dorsal fins, the hinder of which is fleshy. Vent far back. Oblique lines along the sides, like ribs.

Rays, Br. 7. P. 12. V. 8. D. 10—0. A. 17. C. 23.

2. *Small Silverside.* (*Atherina notata*.) With moderate and distensible month, two radiated dorsal fins, upper jaw longer, and dotted anal rays.

Length five inches; depth about one.

Mouth moderate, or rather small; yet susceptible of considerable elongation and distention. Upper jaw somewhat jutting.

Jaws armed with a row of acute, even, and thickset teeth.

A satin stripe the length of the body. Back and tail delicately semi-transparent, or of a pale horny colour. An opaque white over-spreads the intestinal portion of the belly.

Eyes large and silvery. Tail forked. Two dorsal fins, both radiated.

Dark dots at the insertion of the anal rays. Brownish lines on the hyaline back, marking the spaces between the scales, which are easily deciduous. Pectoral fins high on the thorax. Tongue small and smooth. Vent midway. Ribs visible by plain external traces.

Rays, Br. 5. P. 12. V. 5. D. 4—9. A. 25. C. 17.

3. *Green-striped Silverside.* (*Atherina viridescens.*) With large head, bright eyes, and a dark green line from head to tail, over the white stripe, and parallel with it.

Lives in the salt water with the other killifish, sticklebacks, and shrimps. Is exceedingly small, very delicate, and semi-transparent. A greenish line runs lengthwise from the gill-opening to the tail, in contact with a white riband. Back and tail transparent.

Mouth small. Head big. Eyes lateral, spacious, and bright yellowish white. One dorsal fin. Ventral fins on the abdomen, and pretty far back. No teeth. Belly silvery and opaque.

Length scarcely more than an inch; and shape remarkably slender from the head.

MUGIL. MULLET.

Generic character.

Lips membranaceous; the inferior carinated within. Teeth none. At the corners of the mouth an inflected callus. Gill membrane with six curved rays. Body fleshy. Scales large. Dorsal fins two.

New-York Mullet. (*Mugil albula.*) Pale whitish colour, with four rays in the first dorsal fin.

Head compounded of flat, square, and blunt.

Lips thin, soft, and having edges like minute teeth; but which are destitute of hardness when felt.

Lower jaw shorter. Body chubby and round.

Rows of distinguishable scales arranged around the whole circuit of the body, having a distant resemblance to stripes. The colours pale brown, alternated with dirty white.

Pectoral fins high on the thorax. Twelve or thirteen rows of scales on a side. Lateral line obscure among them.

Tail concave; but scarcely amounting to a fork. Eyes rather large. Two dorsal fins, the first of which is spinous. Two first anal rays spinous.

An acquaintance of mine caught a mullet that weighed two pounds and a half; and this is the heaviest that is remembered.

Rays, Br. 4. P. 17. V. 6. D. 4---9. A. 10. C. 15.

EXOCETUS. FLYING FISH.

Generic character.

Head scaly. Jaws connected on each side. Gill membrane ten-rayed. Pectoral fins very large, giving the power of flight.

1. *Middling Flying Fish.* (*Exocetus mesogaster.*) Silvery blue flying fish, with the ventral fins situated on the middle of the abdomen.

The specimen I examined was rather less than four inches long; and was brought from the ocean somewhere to the south.

The pectoral fins reached back almost to the tail; and the ventrals were situated midway on the belly.

2. *Single-bearded Flying Fish.* (*Exocetus comatus.*) With single cirrus to the chin.

Five inches was the length of the one from which the present description is made.

Back brown. Belly shining white. Lateral line straight.

Pectoral fins reach as far back as the posterior extremity of the dorsal. Ventral fins long, and situated far behind.

Scales deciduous, and the lines between them decussate.

But the greatest peculiarity is a cirrus or string of two inches and a half in length depending from the chin, at the extremity of the lower jaw. This excrescence is single, blackish, tough, and elastic.

Rays, P. 12. V. 6. D. 11. A. 6.

3. *Double-bearded Flying Fish.* (*Exocoetus furcatus.*) With a double cirrus.

The individual I examined was three inches long, with large eyes.

Belly carinated on both sides; but not serrated. Ventral fins ample and placed about two thirds of the distance between the pectorals and the vent.

Two cirri or tough appendages, half an inch long, hanging from the chin.

Scales small and adhesive, forming a complete and durable covering for the back and sides, and arranged in rows that may be counted.

POLYNEMUS.

Generic Character.

Head compressed, covered with scales, snout very obtuse and prominent. Gill membrane five or seven rayed. Separate filaments or setaceous processes near the base of the pectoral fins.

Three-fingered Polyneme. (*Polynemus tridigitatus.*) The individual I examined belonged to this genus, and had three appendages from the anterior part of the thorax.

CLUPEA. HERRING.

Generic Character.

Side plates of the upper mandible serrated. Gill membrane eight rayed. Gills internally setaceous. Abdomen sharp and generally serrated.

* With serrated bellies.

1. *Shad.* (*Clupea alosa.*) With dusky back, shining sides, deciduous

scales which expose dark spots in a row as they are carinated with deciduous scales.

Comes from the ocean, and visits us at New-York regularly about the end of March or beginning, highly prized by the people as an article of food, in a fresh state; but is reckoned very good when pickled.

Ascends toward the sources of the Hudson and other American rivers to breed. Usually weighs from five to ten pounds, but has been taken as heavy as twelve pounds.

Is so well described already in the books, that repetition is unnecessary.

I cannot, however, forbear to add the following note taken by myself from an inspection of one of the fairest specimens of New-York shad.

Head small. Tongue smooth. Lower jaw shuts into the upper. Back arched. Belly gibbous. Body plump. Tail forked.

Belly carinated and serrated, with scaly plates on both sides.

Back brown, bluish, greenish, and brassy, in individuals of the same draught and parcel.

A dark spot near the gill-opening; and behind it and along the side, a row of about six or eight more which are undistinguishable when the scales are on, but appear instantly when they are removed. Scales readily deciduous. Upper lip bifid.

2. *Staten-Island Herring*. (*Clupea mediocris*.) Grows very large for a herring, being frequently eighteen inches long, and almost as big as small shad.

Six or eight brown spots longitudinally below the lateral line. The first one distinct and permanent, the others fainter, and sometimes scarcely discernible. All, save the foremost, covered by the scales. Considerable yellow-green about the head and gill-covers. A stripe of paler hue encompasses the lateral spots.

Back brownish. Belly white, and its edge deeply serrated.

Dorsal fin about midway of the back. Ventrals opposite. Mouth and tongue quite smooth. Upper lip slightly bifid. Tail deeply forked. Lower jaw double, elongated and furnished with a tooth to suit the bifid notch.

Is reported to be an inhabitant of that part of the bay of New-York which borders on Staten-Island.

Rays, Br. 3. P. 16. V. 9. A. 20. D. 16. C. 27.

3. *New-York Herring.* (*Clupea harec.*) Has no spots on the sides. Back variegated with intermingling shades of blue and green.

Beneath the lateral line a yellow stripe. Sides below, a silvery white.

Belly serrate. Tail deeply forked. Mouth and tongue smooth.

Rays, Br. 7. P. 16. V. 9. D. 16. A. 19. C. 21.

4. *Long-Island Herring.* (*Clupea mallowaca.*) Called also the autumnal or fall herring.

Length frequently from twenty inches to two feet; and depth from four and a half inches to six. Is caught most commonly in autumn, and brought to market with the fall running of striped perch, or rock fish. In October and November the present fish is taken in seines of the surf-side of the beaches fronting Long-Island. He occupies a middle station between the shad and the Staten-Island herring. The individual before me, a middling one, weighed twenty-two ounces. Sometimes reaches four or five pounds.

Beside the general features of the clupea tribe, the present species has the following marks. A lower jaw thick, double, and projecting. The upper jaw slightly bifid. There is a little eminence on the tip of the lower jaw to suit the notch in the upper. When the mouth is closed, the extremity of the chin is the most projecting part of the head. The eyes are large and yellowish. There is a sooty spot behind the gill-opening, above. The dorsal fin is single, consisting of seventeen rays,

placed about the middle of the back; and the ventrals are almost exactly opposite to it below. These latter consist of nine rays. The pectoral fins are situated far forward, and composed of sixteen rays. The belly is serrated as well as carinated; and the serræ are more and more distinct, as they approach the vent.

The colour of the back is brownish, with but weak tints of green and fainter of blue. Below the green shading, there is a faint riband of yellowish, about three quarters of an inch wide from head to tail. Below this the skin whitens toward the belly.

The scales are deciduous and silvery. And, as in various other species of this genus, the true complexion and hue can only be distinguished after their removal.

The anal fin and the caudal have each twenty-one rays, and the branchial seven. The tail is profoundly forked, and when naturally expanded measures between four and five inches across from one extremity to the other.

Some call this fish the *shad herring*, and some the *fall shad*. He is reckoned to be almost equal to the shad, as an article of food. He is probably the full grown fish of the *mediocris* species. Though I have marked them as different, they certainly approach so near that it is impossible to discriminate the species in many individuals.

5. *Tiny Herring*. (*Clupea pusilla*.) About six inches long. Three faint lines or stripes, lengthwise along the back, with imperfect vestiges of more.

Belly serrated. Tail forked. Figure and colour so much like the *C. halec*, that he is not improbably the young of that species.

Rays, Br. 7. P. 14. V. 9. D. 14. A. 18. C. 21.

6. *Little Herring*. (*Clupea parvula*.) About six inches long, having neither stripes nor spots.

A little greenish about the head, gills, and eyes; but neither green nor

blue on the back or sides. Back of an unimixed, though not deep brown, which passes through regular gradations of hue to a silvery whiteness on the sides and belly.

Has a delicate, and, as it were, a semi-transparent appearance.

Tail forked. Belly serrated.

Rays, Br. 6. P. 14. V. 9. D. 14. A. 18. C. 21.

7. *Bony-fish, Hard-heads, or Mersbankers, of New-York. (Clupea menhaden.)* About fourteen inches long. Frequent the New-York waters in prodigious numbers. From the high banks of Montock, I have seen acres of them purpling the water of the Atlantic ocean. The waters of Long-Island sound, and its bay, are often alive with shoals of them. They are eatable; but as they are too abundant for consumption as food, and as there are multitudes of preferable fish, menhaden are often left to putrify on the shore, or are removed to the fields for manure.

The history of this fish has been written by Mr. B. H. Latrobe, and published with a figure, in the Philosophical Transactions of Philadelphia, vol. v. And the manner of converting him to an ingredient for fertilizing land, has been explained by Ezra L'Hommedieu, Esq. in the Agricultural Transactions of New-York, vol. i. p. 65. The aborigines called him menhaden.

The whalemén say he is the favourite food of the great bone-whale, or balæna mysticetus. This creature, opening his mouth amidst a shoal of menhaden, receives into its cavity the amount of some hogsheads of menhaden at a gulp. These pass, one by one, head foremost, down his narrow gullet; and eye witnesses have assured me that, on cutting up whales after death, great quantities of menhaden had been discovered thus regularly disposed in the stomach and intestines.

Gill-cover very large. One blackish spot on the neck near it.

Head and back greenish brown, with a few marks of brighter green on the head. Belly and sides considerably iridescent.

Back arched, rounded, and thick. Tail forked. Belly serrated.

Mouth and tongue toothless and smooth. Gills rising from the back of the tongue on both sides of the wide throat.

Rays, Br. 7. P. 15. V. 7. D. 19. A. 19. C. 27.

8. *Sprat Herring of New-York.* (*Clupea indigena*.) In its general aspect and character, this fish resembles the *C. parvula*, before described. But is, however, rather larger, and has a brownish-green spot on the upper part of the branchial opening.

He is somewhat green about the head, gills, and dorsal fin.

The rest of the back pale brown, or a sort of leaden colour, brightening up to a silvery along the sides and belly. The latter strongly serrated.

Rays, Br. 7. P. 15. V. 9. D. 16. A. 19. C. 25.

9. *Spring Herring, or Alewife.* (*Clupea vernalis*.) Comes with the shad to New-York, in the latter part of March and the first of April, annually. Is about twelve inches long, and three deep. Called *alewife*, probably from the French *alevin*, the young fish rejected as being under size.

Lower jaw longer than the upper, and the upper slightly bifid. Head rather small, and inclining to a pale brassy yellow. Eyes large, and yellowish white. Back bluish green, with tints of purple occasionally. Lateral line very faint. A light brassy stripe, about an inch wide, though not nicely defined, extending between the upper part of the gill-opening and the tail, with sometimes traces of four or five cloudy lines. The rest of the sides and belly bright as alloyed silver.

Belly strongly serrated, particularly between the abdominal fins and the vent. The anal fin has sometimes seventeen rays, though the more usual number is nineteen.

Behind the branchial opening, and on the thorax, a scaly plate, and a

dark spot. A row of four or five other lateral spots sometimes to be counted on different individuals of the same parcel or draught. Tail deeply forked. Scales very easily deciduous. Mouth toothless. Gill-openings ample.

A row of cuspidated marks, caused by internal bones on each side of the belly, arising from the carinated edge, and lapping on as it were with the ribs. Is one of nine or ten species of clupea that visits New-York.

Rays, Br. 7. P. 15. V. 9. D. 17. A. 19. C. 21.

We are informed, upon very good authority, that this very species of fish used to spawn in Crumpond, a source of the Peekskill, and in lake Otsego, at the head of the Susquehannah. Thither the herrings went yearly to breed, by the way of the Chesapeake and the Hudson. And they have discontinued their visits only in consequence of being excluded by the mill-dams erected across the stream.

The like impediments have shut them out of many places on Connecticut river, which they formerly frequented.

During the session of the New-York Legislature, at Albany, in 1810, when I was last a representative from the city, in the house of Assembly, there was a strong exertion made to procure the enactment of a statute for facilitating the navigation of the Hudson, between the villages of Troy and Waterford, by constructing a dam with a lock across the river there. I made strenuous opposition to the bill that had been introduced for the purpose. The grounds of my objections were various. But one upon which I considered myself firmly footed, was the injury which would be wrought to the fisheries in the river by such an obstruction. I contended that by depriving them of access to the places they loved to frequent for the purpose of perpetuating their race, there would be danger of driving them from the river altogether; and I called upon the delegates from Richmond and King's counties near the ocean, to the members from Washington and Saratoga above, to unite

in rejecting the preposterous scheme. In the course of my speech, I observed, "that I considered myself the advocate of the fish; I begged the house to view me as the counsel for their silent tribes; like Saint Antonio, I felt a deep concern for their welfare; and I entreated the members to oppose, by a unanimous vote, the adoption of the meditated measure, as big with ruin to the innocent inhabitants of the floods." The project was negatived by a very large majority.

The life of the herring has never been thought important enough to be put under the protection of the law in New-York. Even in the last edition of our statutes, under the revision of Van Ness and Woodworth, no notice is taken of these fish. This may perhaps indicate the diminution of their numbers, and the smallness of the fishery. It is scarcely a public object. In the act of April 5th, 1813, "relative to the fishery in certain waters," salmon, trout, shad, oysters, suckers, pike, and pickerel, are mentioned; but the name of herring does not occur. And the "act declaring certain waters to be public high-ways," &c. passed April 2, 1813, is equally silent of these fish. In the regulation of set-nets in the Hudson river, between Troy and New-York, and of the buoys and stakes connected with them, the intention of the legislature seems rather to have been, the prevention and removal of obstructions, than the preservation of any species of fish.

10. *Summer Herring of New-York.* (*Clupea æstivalis.*) Has a row of spots to the number of seven or eight, extending in the direction of the lateral line.

Tail forked. Belly serrate; and, in most respects, resembling the *C. halec*, herein already described.

Rays, Br. 6. P. 15. V. 9. D. 16. A. 19. C. 19.

11. *Satin-striped Herring.* (*Clupea vittata.*) With large projecting upper jaw, small lower jaw, silver-striped sides, and forked tail.

Length about three inches and a half, depth rather more than half an inch. Inhabits the salt water, and resembles an atherine.

The upper jaw is much more considerable in size, than the lower, and terminates in a distinct nose or snout. Beneath it, the lower mandible is received and shuts closely. The mouth has no proper teeth ; but both the jaws have very minute and exact serrated edges. The throat, on examination, is found to be surrounded with a row of bristles, long, and disposed funnel-wise ; and investing the sides of the tongue.

One dorsal fin near the middle of the back. The vent is rather nearer the tail than to the head. The ventral fins are small and six rayed.

The eyes are large and yellowish. Gill-covers silvery white. Belly carinated and moderately serrated. Branchial membrane has eleven or twelve rays. The anal fin has about twenty-one.

12. *Blue Herring.* (*Clupea cærulea.*) With bluish complexion, large head, forked tail, and small pectoral and abdominal fins.

Length three inches, depth nearly one ; being a deep fish in proportion to his length. The scales are large for a fish of his size, and readily deciduous. The skin is free from spots and stripes ; and is of a bluish colour. This is less considerable on the belly than on the back. The head and eyes are large. The jaws about even. Tail deeply forked. Belly sharply and delicately serrated. Pectoral fins small ; ventral smaller. Body in some degree semi-transparent.

He may possibly be a variety of one of the preceding species ; but I have thought it proper to mention him by himself.

* * Bellies carinated without serræ.

13. *New-York Shadine.* (*Clupea sadina.*) An elegant species with a small smutty spot behind the gill-cover ; but with neither spots nor stripes on its back or sides. Mouth wide and toothless. Tongue small.

Back delicately variegated with green and blue. Lateral line straight. Sides silvery white, considerably above that line ; and below it quite to

the belly. The white reflects vividly green, red, and other splendid hues. Head rather elongated. Lower jaw projecting.

Scales very easily deciduous. Form neat, taper, and slender. Gills rise into the throat on each side of the root of the tongue. Eyes pale and large. Tail deeply forked. On account of the even connexion of the false ribs, the belly is not at all serrated, but quite smooth. A semi-transparent space in front of the eyes from side to side.

Rays, Br. 7. P. 16. V. 9. D. 13. A. 15. C. 19.

CYPRINUS. CARP.

Generic character.

Mouth small and toothless. Teeth in the throat. Gill membrane three rayed. Ventral fins in general, nine rayed.

1. *Fresh-water Sucker.* (*Cyprinus teres.*) With elongated round body. Low, soft, puckered mouth, and tail nearly even.

Mouth under, toothless, and with a soft and puckered orifice.

Head rather small. Back thick and round, (cylindrically.)

Back and sides a speckled black and white. Belly whitish. Pectoral, abdominal, and anal fins yellowish. Dorsal and caudal dark brown.

Lateral line straight. Abdomen large and frequently flabby. Rays of the fins coarse. Tail almost even.

Inhabits fresh brooks, ponds, and rivers, and in many of them is taken very abundantly. Grows to the size of twelve and fifteen inches.

Is extensively employed in the interior districts for food. And as we find him in the New-York market, is a tolerably good, though rather a soft, fish. Is, perhaps, the *C. catostomus*.

I found, on anatomizing him, a curious division of the swimming bladder into two sacks or cells, having connexion by a small tube.

Rays, Br. 3. P. 17. V. 9. A. 8. D. 13. C. 19.

2. *Chub of New-York.* (*Cyprinus oblongus.*) Mouth under, small, puckered, and toothless. Head somewhat depressed and smooth. Eyes rather small. Gill-openings rather narrow. Pectoral fins very far forward on the neck. Back arched and approaching to gibbous. Body thick, but may be rather termed deep than round.

Back deep brown, inclining to black, with whitish scales. The lines between the scales, dark and decussating each other so as to leave rhombic spaces between them. The lines are darker coloured than the spaces they define.

Belly a pale cream colour, with golden spots or tints, particularly between the pectoral and ventral fins, and near the anal.

Pectoral and ventral fins dusky, with a reddish tinge. Anal, caudal, and dorsal, dark brown.

Lateral line obscure. Tail rather concave.

Rays, Br. 3. P. 15. V. 9. D. 14. A. 8. C. 19.

Lives in fresh streams and lakes like the sucker.

3. *New-York Shiner.* (*Cyprinus crysoleucas.*) With lateral line crooked downward.

Mouth small, even, and toothless. Head smooth and rather diminutive; and lengthened, or depressed on the upper side. Flesh soft. Scales deciduous. A single dorsal fin, and that situated far back.

Eyes large in proportion to the head, and bright; body deep in proportion to its length.

Colour blackish, with shining white scales. Gill-covers golden, with a tinge of the same along the belly. Head often greenish; and when the scales fall off, the back is frequently tinged with green and blue.

Lateral line bends downward to correspond with the curve of the abdomen. This appears only when the scales are on; there is another and a straight one which appears only when the scales are off.

Pectoral and ventral fins, particularly the latter, yellowish brown. Belly whitish, with a ruddy tinge. Tail forked.

Lives in the ponds inhabited by the preceding species, and by the *labrus auritus*, and *bodianus flavescens*.

Rays, Br. 3. P. 17. V. 9. D. 9. A. 14. C. 19.

4. *Brook Minnow*. (*Cyprinus atronasus*.) With a dark stripe extending round his nose and lengthwise to the end of the tail; and a white lateral line inclined downward.

Length about two inches and a half. Lives in the fresh-water brooks, inhabited by trout.

A blackish or dark stripe surrounds the nose, and passes through the eyes, and imparts to them a part of its colour. The rest of the iris yellowish white. Colour of the back, brown, interspersed with blackish spots. Belly shining white, with a few blackish stains. Body scaly. Tail yellowish. Nostrils distinct.

Lateral line bends downward, and is distinguishable like a white trace.

Mouth toothless. Tongue distinct. Eyes lateral, and rather large. Gill membrane three rayed. Pectoral fins orange coloured. Tail forked.

Rays, Br. 3. P. 12. V. 9. D. 7. A. 7. C. 19.

Order, CARTILAGINOUS.

PETROMYZON. LAMPREY.

Generic character.

Body eel-shaped. Mouth beneath, with numerous teeth in circular rows. Spiracles seven on each side of the neck.

Great Lamprey. (Petromyzon marinus.) With brown and olive variegations, with fins some orange and reddish, and a bluish tail.

Two feet and a half long. Is caught in the salt water.

On dissecting the gullet, heart, and respiratory organs of a large one, on the 9th April, 1814, they were found to correspond almost exactly with the anatomical descriptions of Bloch and Shaw ; and the external characters are so alike, that the variations are too inconsiderable for notice.

ACIPENSER. STURGEON.

Generic character.

Snout bearded beneath. Mouth beneath the head, ovate, toothless, retractile. Body elongated, mailed above by scaly tubercles.

1. *Round-nosed Sturgeon. (Acipenser sturio.)* Gray scale-shielded sturgeon, whitish, and often reddish beneath, a five-fold apparatus of scales, and a blunt snout.

Has a roundish and elongated snout with four cirrhi. There are five rows of scales, making the body a sort of pentagon. Two lateral fins

arising from the lateral scaly rows, somewhat forward of the vent. Dorsal fin behind the scales near the tail, and composed of thirty-eight rays.

Anal fin nearer the tail than the dorsal. Tail unequally forked, and the larger division slanting upwards.

Caudal, anal, lateral, and pectoral fins often reddish.

The blunt snout grooved between the eyes.

Twelve scales between the head and dorsal fin ; twenty-nine or thirty on the upper side-rows between the gill-opening and tail.

On examining the alimentary canal, the stomach was found very much to resemble, in its strong and knobbed muscular organization, the gizzard of birds, and was filled with small bivalve shell fish. Roes, in the female, blackish and very numerous, filling much of the abdomen.

Frequents the Hudson, and, during the hot season, is remarkable for leaping his whole length out of water, and splashing clumsily as he returns.

2. *Sharp-nosed Sturgeon.* (*Acipenser oxyrinchus.*) Having a pentagonal form, with scabrous asperities between the scales, and a sharp snout.

Agrees in many respects with the preceding species ; having, like it, five sides and as many scaly angles. Whether the individuals now under consideration, differ from the *A. sturio* merely in sex and age, has been made a question. But the dissimilitude of the *blunt-nosed* and *sharp-nosed* sturgeon, is very obvious. The mouth, nostrils, and eyes, are different.

The number of scales in the sharp-nosed sturgeon, is not so great as in the blunt-nosed. On all the angles they are less numerous. The skin is more scabrous. The asperities between the scales, are very distinct, and scratch the finger like a grater when moved along them, especially from tail to head. The points resemble the spiculæ of minute crystals, occupying much of the space between the scales.

The scales themselves are bony, rough, and serrated behind, and very distinct in their configuration. There are four scales between the vent and the anal fin ; the two foremost of which make a pair ; and four more between the anal fin and the tail, the two foremost of which lap over the base of that fin in some measure, and support it. But sometimes there are more, and at other times fewer.

There is osseous matter on the sides of the snout, and a strip of the same beneath it, reaching from the tip toward the mouth.

The boys remark, that the gristle taken from the sharp-nosed sturgeon, is much less elastic than that of the blunt-snouted, and that a ball made of it does not bounce so well.

Grows seldom to a greater length than five feet. Is found in the Hudson plentifully, in the neighbourhood of Albany. My friend Simeon De Witt, Esq. informs me, " they are every year brought to the market of that city, under the name of *young* sturgeon. I suspect them to be of a different species, for two reasons. 1. Because there is no intermediate size between the largest of these and the smallest of the common sturgeon ; and 2. The females of the smaller sort are all filled with spawn."

LOPHIUS. ANGLER.

Generic character.

Head depressed. Teeth numerous and sharp. Tongue armed with teeth. Pectoral fins brachiated.

1. *Toad-fish.* (*Lophius bufo*.) With semi-circular cirrhous dots under his eyes, loose pursy, skin, and brown, clouded, and mottled complexion.

Length about twelve inches ; breadth almost four ; depth two. An inhabitant of our salt water.

Cheeks full, and appearing as if bloated. Neck very thick, and seeming to be merged in the head and thorax. The chubby and clumsy forepart tapering away exceedingly toward the tail.

Skin scaleless, slimy, adhesive, and covering the body loosely like a shirt. A dozen or fourteen soft skinny cirrhi beneath the lower jaw. A diligent search will find a larger one near each angle of the mouth. Projections of a cirrhous kind, discoverable by nice observation along the forepart of the upper jaw. A row of small and soft tubercles under each, to the number of eight or more ; and to be traced along with some interruption, to the upper part of the tail.

Mouth enormous. Eyes approximated, prominent, dark-hyaline, and surrounded by the soft yielding skin. Branchial rays enveloped in the same lax and tenacious covering.

Upper lip furnished with a set of small and not very sharp teeth. Upper jaw itself armed with a stronger and larger set, which are more blunt. Lower jaw supplied with teeth like those of the upper, which at the front are more clustered and numerous.

Tongue conspicuous and smooth. The same laxity of the integuments in the mouth that distinguishes the external surface.

Colour light brown, clouded, and mottled all over with dark brown, excepting the belly, which is of a flesh colour, with yellowish from the chin to the vent, interspersed here and there with blackish marks.

Several processes imperfectly spinous at the hinder part of the gill-cover.

When the mouth is shut, the lower jaw rather projects and shows its front teeth.

Gill-opening moderate and single on each side ; directly before the pectoral fin. That fin stout, brachiated, and ending in flexible rays. Its circumference roundish, and banded across with dark upon the paler ground.

Two dorsal fins, whereof the first is bluntly spinous, enveloped in the loose wrapping skin.

Second dorsal and anal clouded obliquely. Caudal banded transversely.

First ray of the ventral fins incurved, and covered with pleats and puckers ending in a skinny point.

A spot like an excretory duct in the axilla, behind the pectoral fin.

Soft and inconsiderable eminences on various other parts of the body.

Ventral fins a little forward of the pectoral.

Rays, Br. 6. P. 19. V. 2. D. 3—27. A. 21. C. 12.

2. *Bellows-fish, or common Angler.* (*Lophius piscator*. With broad head, enormous mouth, jaws armed with sharp teeth; and a row of cirrhi all around the chin, and extending to the pectoral fin on each side.

The length of the individual now before me, is three feet; and the greatest breadth, without including the pectoral appendages, sixteen inches. His depth about three inches and a half. He was taken with a hook, in the Atlantic ocean, near New-York, by a man who was fishing for cod. The present specimen is considered a small one, for the species.

The colour of the back was a brownish olive, and of the belly white, with a dirty tinge behind. There are no scales; and the skin is loose, and may be pulled from the flesh in folds.

There is a row of cirrhi, some of which are rather more than an inch long with foliated edges around his chin; and reaching along on both sides to the pectoral fins. Between, and among these, are numerous smaller ones irregularly disposed. From the pectoral fins quite to the tail, the sides are beset with cirrhi, some of which are an inch in length. They occupy a limited space along the sides, but are not planted straight nor in a row.

There is a ray almost seven inches long, which arises at the distance

of an inch and a half behind the upper lip. Three quarters of an inch behind this, and further back on the head, is a second ray of about the same length. The former is furnished at the tip or summit, with a fleshy cirrus of nearly two inches long; the latter has no such addition, but is bare. Four inches behind the latter of these, is a third solitary ray, with more of a membranous connexion than either of the former. This may be called the first dorsal fin. Three inches behind this, are three rays associated and connected by a membrane. The foremost of these exceeds three inches in length. These may be called the second dorsal fin. Four inches behind this, commences another fin, which may be truly denominated the third dorsal. It consists of twelve rays, covered with the skin.

The pectoral fin or appendage, contains twenty-seven concealed rays. The branchial membrane is large and loose, containing five rays on each side. The caudal fin has eight coarse and forked rays. The anal fin has ten rays. Each ventral fin contains five rays that are covered by a white and somewhat puckered skin, and bear some resemblance to a hand.

Both the lips and jaws are armed with acute and conical teeth, some of which are half an inch long, and many of them are sheathed with skin or membrane. The palate and throat are patched with parcels and spots of teeth.

There is a large bony process on each side, between the head and pectoral fin, a few inches forward of the gill-opening: and several other concealed processes about the head.

There are two orbicular cirrhi on the fore part of the upper jaw.

He is called by some the *bellows-fish*, from some resemblance his figure bears to a bellows, and from a power to inflate or swell himself immediately after being taken out of water. They have named him also the *sea-devil*, on account of his ugliness.

His mouth has an excessive gape. The lower jaw projects. The teeth are commonly exposed. The throat is unusually wide and capacious. The creature may be said to consist of head and tail, with very little intervening body. The gill membrane is extensive and flabby, containing cavities from the opening, like pockets.

Var.—Foliated Angler. (Lophius foliatus.) With a leafy expansion on his dorsal rays.

Agrees generally with the *L. piscator*, but the linear tentacula or processes, situated along the back, are some of them expanded at their summits to the form of leaves, and others distinguished at their sides by little knobs resembling vegetable buds.

BALISTES. FILE-FISH.

Generic Character.

Teeth several in both jaws. Body compressed. Abdomen carinated. Skin tough, often reticulated by scale-like divisions.

1. *Tutmouthed file-fish. (Balistes broccus.)* With brown skin, serrated horn, and small mouth turned up.

Usual length seven or eight inches ; sometimes more.

Body brown, without lines, spots, or bands ; and exhibiting only variations of shades, and a roughness like shagreen.

A single horn rising from a knob between the eyes. The horn straight, slender, and somewhat serrated on its posterior part.

Dorsal and anal fins delicate, and consisting of many rays.

Belly more pale than the back and sides, and pendulous like a pouch. Caudal fin long.

2. *Trigger file-fish. (Balistes sufflamen.)* With the skin marked into rhombic divisions.

Length fourteen inches ; depth five, exclusive of the dorsal fin. No

ventrals. The upper and lower caudal rays longer than the rest ; the central ones longer than those which are situated between them and the lower and upper ones.

Hindmost dorsal fin opposite the anal, and both of them broad, and the distance between their expanded points eight and a half inches.

First dorsal fin three spined. The first ray strong, long, and rough, on the forepart ; the second and third not half so large. The whole three connected by a firm membrane. They are capable of being depressed or let down into a deep furrow. A peculiarity in this dorsal fin, is, that when it is erected, it is kept erect by catches in the bones and soft parts within ; and that if the third ray is pressed downward, the first and second are released from the catches, and descend into the furrow, without impediment. Every beholder traces the resemblance to the lock of a gun, the foremost ray being the cock, and the hindmost the trigger. In the fresh specimen, the catches are four, and determine the angle of the ray's elevation or descent, from about eighty degrees to the horizontal line, or 0. Is said to shed his scales almost immediately after he is taken out of water.

Colour dove or ash, with sometimes a dull zone back of the pectoral fin, and another between the dorsal and anal spreading toward the tail. The skin marked out in lines decussating each other like a file.

Eyes light brown, large, and high up toward the first dorsal. An inch in front of the vent is a rough broad obtusely serrated process ; and from this to the vent, there is a row of naked spines on the carinated edge. On each side of the belly, near this carinated edge, two or three rows of small rough warts or knobs.

3. *Orange file-fish.* (*Balistes aurantiacus.*) Length between sixteen and seventeen inches ; depth six ; and thickness (so peculiar is its figure) scarcely more than one inch and a half. He might almost be taken for

a flounder, when he lies on his side ; yet he swims perpendicularly, though he is so remarkably thin and flat.

Mouth very small, and furnished with distinct lips. The upper jaw short and retiring. Lower lengthened and jutting. The teeth seem to be four in each jaw, and present in each three biting points.

Colour all over the body and tail, are orange yellow, except the chin, lips, belly, and the space extending toward the eyes and back, which is of a bluish white. Where the orange predominates, there are variegations of white, and where the white prevails, there are clouds of orange. A sort of semi-transparency permitting the blood vessels to be seen along the cheeks and nose.

Skin rough, without prickles or scales ; and feels almost like that of a shark, wearing away the fingers, especially if moved from the tail headward.

A bone or horn between two and three inches long immediately above the eyes. It may be reckoned as a first dorsal fin. It is white, rather irregular, and rough on all sides like the skin. On the posterior part, toward the summit, a small prong or branch. This ray or projection, is capable of being elevated to a right angle, but has a catch, like that of the balistes sufflamen, at about the angle of forty-five.

Eyes large, and situated about midway between the gill-opening and the horn. Colour dark, with a hue of pale green. Gill-opening oblique. Tail convex and rounded. Two small orifices, like nostrils, in front of the eye.

A large ensiform cartilage extending almost from the neck to the vent, and giving protection and form to the belly. No ventral fins. Pectorals small. Belly flabby. Rays of the dorsal, anal, and pectoral fins, dark toward their extremities.

Rays, B. 13. D. 1—34. V. 0. A. 38. C. 12.

Caught at the city of New-York, August 1, 1814, and examination made from the fresh specimen, sent me by Robert Fulton, Esq. a gentleman whose social virtues and inventive talents were of the first order.

DIDON.

Generic Character.

Jaws long, undivided. Body beset with moveable spines.

1. *Spot-striped Diodon*. (*Diodon maculato striatus*.) Having zebra stripes mingled with thorny spots.

Length four inches ; breadth about three. Figure of the head and body square and chubbed.

Tail slender, convex, and short. Dorsal and anal fins far behind, and near the tail. Pectoral fins broad and almost rectangular.

Eyes two inches asunder ; and their brows prominent and bold.

Four or five rows of stiff and acute prickles run from the orbits of the eyes, and the adjacent space along the back, toward the tail. The sides are also occupied by longitudinal rows of spines. A soft teat-like process on each side, at a small distance from the vent.

So likewise is the belly. But on this part they are shorter. On the back they are nearly a quarter of an inch long.

Colour of the back and sides brown, and white in streaks. Between the mouth and eyes, between the eyes and pectoral fins, and between these last and the tail, the stripes are transverse ; but on the back they go lengthwise from the forehead to the dorsal fin.

Behind the dorsal fin, the white and brown lines are oblique, and meet at the ridge. Belly white or orange.

On each side, behind the pectoral fin, a dark spot with a spine in the middle ; the spot rather oblong, or of an irregular circumscription, and partly covered by the pectoral fin. In the full-grown individuals, a

smooth spot below the dorsal fin amidst the spines. Sometimes a spiny spot obliquely behind the pectoral fin.

I examined the fresh specimen of this species 20th June, 1814.

2. *Hairy Diodon*. (*Diodon pilosus*.) With a covering of bristly hair.

Length about an inch and a half; breadth less than half an inch; depth nearly a quarter; making a blunt lump of a fish.

Is covered all over, back, sides, head, and belly, with bristly hair. The bristles strong and flexible, without the power to scratch or to prick.

Hair about the eighth of an inch in length. Complexion dun or brown; with spots on the back, sides, and toward the belly. Has, at first glimpse, the appearance of a young mouse.

Mouth small, midway, and horizontal. Eyes vertical, lateral, and large. No ventral fins. Pectorals broad. Dorsal and anal very far back; and no hair between them and the tail. This is but a small projection from the thick and clumsy body, and is terminated by a fin of seven rays.

Dorsal, anal, and pectoral fins contain each about thirteen rays.

CEPHALUS. SUN-FISH.

Generic character:

Jaws bony. Body terminating abruptly, so as to resemble the head of a fish.

Short sun-fish. (*Cephalus brevis*.) With a suborbicular body.

The one I examined was harpooned within Sandy-Hook. He is frequently seen on the coast of North America, by mariners. The dimensions of my specimen were these; from the nose to the extremity of

the tail, three feet and eleven inches; from the back to the belly, two feet; and from the point of the dorsal to the tip of the anal fin, five feet and one inch. He weighed upward of two hundred pounds. For the generosity of my friend Commodore Rodgers, of the navy, in bestowing a fine preparation of the North American sun fish, see vol. xv. of Medical Repository, p. 195. Sailors have a superstitious reverence for them, and seldom disturb them. Small fishes have been observed to attend them, as pilot fishes do the shark.

TETRODON.

Generic character.

Jaws bony, divided at the tip. Body roughened beneath. Ventral fins wanting.

1. *Curved Tetradon.* (*Tetradon curvus.*) With curved back, pouched belly, and brassy complexion.

Length about two inches and a half; depth rather more than one; and girth, when the belly is inflated, nearly three. Inhabits the bays of Long-Island.

The back is considerably arched; and the belly capable of great distention. The back is smooth, and dark brown, variegated with faint bars across. The belly is dull yellow, and roughened by short sharp spines disposed in quincunx. Between the back and belly is a smooth brass-coloured stripe or riband, from head to tail.

Upper teeth project. Mouth small. Lower jaw shuts within the upper. Eyes large and almost halfway between the nose-extremity and the gill-openings. One dorsal fin, and that much behind. Tail tapering, and the rays of its extremity long and rather forked, with fifteen rays.

The pectoral fins are broad, even, and composed of about sixteen rays. The part contiguous to the branchial aperture is brassy. The dorsal has thirteen rays, growing out of a skinny protuberance. The anal has the same number, situated on a similar process.

2. *Puffer*. (*Tetrodon turgidus*.) With yellowish variegated back, white rough belly, and a remarkable propensity to distend the abdominal sack with air when he is out of water.

Length about twelve or fourteen inches ; depth rather less than two ; and breadth about three. But the belly is loose and flabby ; and it may be distended to a large size, apparently at the will of the fish. This happens frequently after he is taken from the water. The air is inhaled with a sucking or swilling noise. When received into the cavity, it is confined there by a valve in the throat. This valve is so strong, and so tight, that not a particle of air can escape. The hardness equals that of a football ; and the fish will bear to be kicked about without discharging it. I have seen them stamped upon, and still retain their charge of air. I have known them to bounce from the surface of a rock, against which they have been thrown, as turgid as ever. And it is a piece of sport, common enough among fishermen, to burst them between two stones, where the air is let loose with a noise almost equal to the report of a pistol.

He is called, in some places, *toad-fish*, because his back is mottled with yellow and dark somewhat like that of a toad.

He is taken both in the seine and by the hook. In the former with herrings and flounders ; by the latter in the waters inhabited by black-fish and bergalls. They are very troublesome by nibbling away the bait ; and when caught are in no estimation as food.

When he is out of water, alive, and not in a state of distention, he usually rests on his abdomen, and not on his side ; and his dying struggles exhibit a sort of wriggling motion.

He is found only during the warm season ; and often disappears by the beginning of September.

Sometimes, when he is distended to hardness with air, and thrown into the water, he floats away to some distance, his white belly resembling a mass of froth : when he suddenly discharges the air, sinks, and escapes.

3. *Mathematical Tetradon*. (*Tetradon mathematicus*.) With olive-green smooth back, satin-white sides, snow-white belly, and ecliptical lateral line.

The grand specimen of this curious fish which I examined on the 29th June, 1814, had the following characters :

Length twenty-two inches ; depth five and a half ; breadth three and a half.

Skin without scales, and on the back and sides smooth. The belly planted with short and acute prickles in quincunx rows.

Colour of the back a dark olive or deep bottle green ; of the sides a splendid silky argentine nearly three inches broad, with a delicate cast of green ; of the belly a snowy white. All these divisions well defined, without stripes, bands, or spots.

Eyes pale yellow, and surrounded by an irregular line at the distance of an inch and more.

Lateral line departing from the ring encompassing the eye, like a tangent ; ascending in a superb curve toward the back ; sweeping boldly down from the olive of the back through the satin of the side ; and then running direct to the tail ; putting one in mind of the ecliptic cutting the equator.

A transverse line from one lateral to the other, above the pectoral fins. Another line from the eye-circle to the transverse line, and parallel to the lateral line, making a sort of parallelogram.

Lips skinny, thick, and loose, resembling almost the human lips.

One dorsal and one anal fin, both far back.

One branchial opening exactly in front of the pectoral fin, which is dark brown, broad at its insertion, and rather lunated at its extremity.

No ventral fins. Caudal fin lunated and bold. Eyes vertical, and across the broad and flat head, three inches apart. Belly lax and pouch-like.

Taken on the south side of Long-Island, and in the bay of New-York.

Rays, P. 17. D. 14. A. 13. C. 11.

SYNGNATHUS. PIPE-FISH.

Generic character.

Snout subcylindric, with terminal mouth. Body lengthened, jointed, mailed. Ventral fins none.

1. *Smaller Pipe-fish.* (*Syngnathus typhle.*) With hexagonal body and pinnated tail.

Length between seven and eight inches. Gill-openings near the back of the neck. Body distinctly hexagonal; or if the line of the belly be considered as making an angle, then it is heptagonal. The seven sides change to four behind the dorsal fin; for the tail is quadrangular and tapering. An imperfect scale behind the vent, with two very small divisions.

Colour a pale brown, with zones of darker brown from head to tail. Is caught frequently in our salt waters during the warm season.

Rays, P. 13. D. 32. C. 9.

2. *Sea-horse Pipe-fish.* (*Syngnathus hippocampus.*) With thick head, subhexagonal, tuberculated body, and quadrangular finless tail.

Generic character.

Mouth situated beneath the head, transverse, beset with teeth. Spiracles beneath, five on each side of the neck. Body in most species sub-rhomboidal.

1. *Raja torpedo*. (*The numb-fish or cramp-fish*.) I place the torpedo among our native fishes on the authority of several persons whom I have questioned on the subject. This fish is sometimes taken with the hook and line on Saint George's Bank, and in the ocean near Block-Island, and to the southward of it. The occurrence is so rare, that but few are caught in the course of a season. These, however, make impressions strong enough to be well remembered. I showed to two intelligent fishermen, who had drawn them from the bottom alive, the figure of the animal in Bloch's Ichthyology, and they were instantly struck with the likeness. They said that on loosening the hook from the creature's mouth, the arm of the captor was frequently benumbed for five or six minutes, quite to the trunk. And when a knife was employed to slay the torpedo, the torpor occasioned by the touch of it was great enough to make the instrument fall from the grasp of the fingers. The numbness has been known to continue a whole afternoon, especially in the shoulder.

Evidence to the same point has been collected by Dr. Wiley, a resident on Block-Island, as contained in his letter to Dr. S. Akerly, of November 28, 1814: "You request me, dear sir, to give you what information I possess respecting the electric fish said to inhabit our waters. This fish I have never been fortunate enough to see; and am unacquainted with it, otherwise than by the reports of fishermen. From

the concurrent accounts, however, which I have received, I am inclined to believe this singular tenant of our seas is the torpedo. My reasons for this conclusion are the following :

“ 1. The electric fish on our coast is known by the name of *numb-fish*. This you know is the vulgar appellation given the torpedo by many Europeans, from whom the term probably passed to our shores.

“ 2. The description given of the numb-fish by those who have had opportunities of examining it, corresponds remarkably with that given of the torpedo by various writers.

“ 3. On showing the figure of the torpedo to fishermen, they have always recognised a striking resemblance of the numb-fish. Indeed, some have pronounced it the numb-fish at first view.

“ 4. The numb-fish is represented as communicating a benumbing shock when touched by the hand, or with a knife. The shock has been known to be so violent as to deprive the arm, for a short time, of all voluntary motion.

“ This fish has never been caught, as far as I can learn, except by the hook when fishing for cod. It is scarce round this island, and seldom taken. On St. George's Bank it is more frequent.”

Captains Rose and Dodge, of the town of New Shoreham, have assured me, that, according to their best estimation, having never used the balance, the numb-fish sometimes weighs as much as a hundred pounds, *avoirdupois*. The liver is the only part which the fishermen prize ; this organ they cut out, for its oil, and throw the body overboard.

2. *Ocellated Ray*. (*Raja ocellata*.) With brown spotted and sharp prickly back.

One of these fishes that was thirty inches long, was nineteen wide. The shape rhomboidal.

Colour of the back ash or pale brown, spotted with black. Toward the posterior part of the flaps, a whitish mark on each side, resembling a butterfly's wing. Occasionally several smaller ones of the same kind.

Upper surface, over its principal extent, beset with prickles curved backward. These prickles are most frequent on the snout, near the eyes, and down the back to the end of the tail; with exceptions of a space on each side of the mid-back, that is nearly bare of them, and of a space down the back and tail, where there are none at all. The longest and strongest prickles are on the sides of the tail.

Lower surface smooth and white, without proper spots, but interspersed with a few black dots, and an appearance of slender lines here and there. Lower and hinder parts of the fins and tail ruddy.

Mouth broad, with teeth in both jaws like those of a file.

Tail thick and stout, with two fins on its upper side. Rays in the foremost difficult to be counted; in the hindmost amount to about nine. Both of these fins rough with small prickles. Under side of the tail, as well as the belly, entirely smooth, with a fringe or membrane on each side of the tail below the prickles.

Snout moderately projecting. Surface covered with a thick slime.

3. *Clear-nosed Ray*. (*Raja diaphanes*.) With a semi-transparent rhomboidal snout, and roughness on its middle, and on the margin of the body toward the flaps.

The individual from which the present description is taken, measured two feet and three inches in length, by one foot and five inches in breadth.

Colour of the back light brown, marked irregularly with dusky, oblong, and roundish spots.

Belly spineless and white, with black dots and vascular branches here and there. A carnation or reddish tinge along the fins.

Middle of the snout rough; as is also the margin of the body toward the wings. A small patch of acute prickles incurved backward, laterally from the eye. A row of prickles reaching from the forepart of the back almost to the tail. Behind the anal fins, and at the root of the

tail, commence two other rows of prickles, one on each side, reaching quite to the extremity. A very trifling roughness, just sensible by the finger, under the snout. Orbits of the eyes jagged or spinous. All the remaining parts smooth and mucous.

A highly finished ciliated membrane covers the pupil of the eye.

The edges of all the fins are neatly fringed with white.

The snout, which is lengthened toward an acute angle, is semi-transparent almost to the eyes; and its clearness allows a finger or a pen to be distinguished through it tolerably well, almost as high up as the eyes.

4. *Prickly-tailed Sting Ray. (Raja centroura.)* A very large species, found on the coast of Long-Island, with a tail of five feet or more in length, covered all over with prickly shields or scales, and armed on its upper side with two naked bones of four inches long inversely serrated.

Tail in Scudder's Museum.

5. *Cow-nosed Ray. (Raja bonasus.)* With a blunt snout resembling the nose of an ox.

This is a large species that visits the coast of New-York, usually about September, in numerous shoals. He enters the bays, and ranges very extensively the flats, where the soft clam (*mya arenaria*) lives. These shell-fish he is supposed to devour; for a shoal of cow-noses root up the salt water flats as completely as a drove of hogs would do. I have seen the water in violent agitation when these fishes were at work in the bottom. They render it so muddy, that they are concealed from sight. Frequently, however, they rise to the top, and may be distinctly observed. I have seen them swim near the surface in clear water. They then support and propel themselves in their element, by their large flaps, as a crow or other bird, with slowly moving wings, passes through the air. They may be said to fly, rather than to swim.

They are detested by the people who live near the shores, by reason

of the damage they do to the clams. Yet they are not employed for human food. When taken in seines they are usually left to putrify on the sands. Though sometimes the fishermen take out their livers for the purpose of conversion into oil.

A full-grown individual of this species weighs about a hundred pounds.

CYCLOPTERUS. LUMP SUCKER.

Generic character.

Head obtuse. Teeth in the jaws. Tongue short and thick. Body thick without scales. Ventral fins united into a circle.

Blue Lump-fish. (Cyclopterus caruleus.) With back and sides of a deep blue, thickly marked by small inky elevations; with a belly of a pea green and white; and with three rows of lumps or cartilaginous processes on each side.

The individual now before me was taken in the bay of New-York, with the shad, on the 11th of April, 1815. He was of a remarkably thick and chubby form. His length was nine inches; depth five and one half; and breadth four. He felt like a lump of gelatinous matter; and looked semi-transparent when held up to the light. But the skin was universally roughened by warts, or excrescences of different sizes.

There were irregular lumps of a cartilaginous kind, forming a ridge along his arched back; and which seemed to have taken the place of anterior dorsal rays. At the termination of this lumpy ridge, there was a broad step or stage, of about an inch long and an inch broad, whose sides were armed with similar elevations and lumps. Behind this, and along the descending curve of the back, was the dorsal fin, consisting of twelve broad and cartilaginous rays. I have since revised my description from a second fresh specimen, taken at the city of New-York, on the 4th of May.

There were three rows of lumps on each side. One proceeded from the eye-brow to the middle region of the tail. Another from the gill-opening above the pectoral fin to the lower part of the tail. A third formed the margin or angle of the belly, reaching from the extremities of the pectoral fin to the vicinity of the anal.

All these lumps, processes, and protuberances, bore a resemblance to the plates on the sides of sturgeons ; but they were not so well defined nor so hard and scabrous.

The belly was broad and flat ; and at the forepart of it was an elliptical organ for adhering to other bodies. It was situated between the pectoral fins. The diameter was one inch transversely, by somewhat more than an inch longitudinally. It was surrounded by a fin or membrane ; and there was an appearance of whitish bars across it, to the number of four.

The vent was distinct, about two thirds the way along the belly ; and the anal fin was composed of ten soft and gristly rays.

The tail terminated straight and even ; consisting of eleven similar rays.

The pectoral fins approached near toward each other, but did not quite unite. They consisted each of twenty rays.

The head was consolidated with the body. The mouth was an inch wide ; and the teeth in both jaws were small and of a softish and yielding nature. The throat also contained some teeth. The eyes were very gibbous and prominent ; the irides of a yellowish silvery ; and their distances on the extremities of the head, two inches apart.

The branchia membrane consisted of four soft and cartilaginous rays.

The nostrils are two, and single ; situated between the eyes ; and ending in tubular orifices.

This animal possessed very little of a fishy odour.

Generic character.

Mouth situated beneath the anterior part of the head ; with numerous teeth disposed in rows. Spiracles on each side of the neck, in most species five in number, of a semi-lunar shape. Body oblong, somewhat cylindric.

1. *Hammer-headed Shark. (Squalus zygena.)* With broad transverse head, and eyes at the extremities.

The voracity of this animal may be judged of from the following occurrence at Sagharbour, in September, 1805 : " Three sharks of the shovel-nosed species were taken in a net by Mr. Joshua Terry, of Riverhead. The largest was eleven feet in length. On opening him many detached parts of a man were found in his belly. These were collected and buried. There was also found a striped cotton shirt patched on the sides and sleeves with bright striped pieces."

The specimen I have in a prepared state, was taken in the bay of New-York.

2. *Thresher, or Long-tailed Shark. (Squalus vulpes.)* With long and very unequal tail, almost smooth skin, and a single row of teeth.

An individual of this species was found, in 1803, on the south side of Long-Island, and described in the Medical Repository, vol. viii. p. 77. with a figure.

" The whole length of the body and tail was thirteen feet and one inch. The skin, though thick as that of the common shark, was not as rough, except a very little on the back. The colour was dusky or brown ; and the shades darker on the upperside than on the belly. The tail was stout and elastic. Its upper side was about three or four inches

broad, and tapered away to an edge below. In this respect, it had some resemblance to the fin of a sea tortoise.

“The teeth were very sharp; about three fourths of an inch long, and formed but one row. The body was very cylindrically round, and possessed the great general features of the shark family.”

3. *Long-toothed Sea Shark.* (*Squalus Americanus*.) With oblong sharp teeth, each of which has a little one on each side at its base.

This fish is occasionally taken at the very city of New-York. He, when he comes, frequents a certain place near the great market, on account of the dead fish and offal thrown into the water there. When the people see one of these sharks prowling about, they bait a hook with a piece of meat, or a fish, and not unfrequently catch him.

The teeth of this species are found abundantly in the alluvial country of North America. They are particularly met with in digging wells, near the Potomac and James river. On the former, they are found as high as Alexandria; and on the latter, in the city of Richmond itself. The long, sharp, narrow tooth, almost resembling a horse-shoe nail, with its two little auxiliaries at its base, is very plain and characteristic. This I know, by comparing the fossil Virginian species in my possession with those in the jaws of sharks taken at New-York.

The mouth of one that was killed during the summer of 1813 was nearer the snout than in many other species. Both jaws had five rows of teeth in front. They were nearly an inch long, and not jagged at the sides. Some of them have the rudiments of two little teeth, on each side, at the base.

4. *Green-backed Shark.* (*Squalus punctatus*.) With black dots round the snout and about the mouth.

Has nasal orifices on each side of the snout, on its lower parts, and forward of the eyes.

Eyes on the side of the head, and wide apart. Their colour leaden, with silvery in concentric circles. Iris oblong and vertical, like cats, and other land animals of prey. The eyes seem more moveable in their sockets than is usual with fish.

Mouth wide and voracious. Teeth small, triangular, and without jagged edges. Arranged in rows, one in the upper, and two in the lower jaw. Tongue white and broad. That, and the palate, beset with a delicate roughness, meeting the finger when it is drawn over their surfaces from the throat toward the lips.

A row of excretory ducts runs along the upper lip, from one corner of the mouth to the other. Two other rows begin at the angle of the jaw, and run forward toward the nasal orifices, until they disappear and are lost amidst a great number of similar orifices, which distinguish the under side of the snout. These openings are blackish, and make a plain contrast with the whiteness of the skin. The sides and upper part of the snout are perforated with a plenty of similar holes. From them may be squeezed a mucilaginous fluid; evincing their function of supplying the skin with its slimy covering.

When this shark is in the water, his back and sides appear greenish. But soon after his exposure to air, and immediately after his death, the hue becomes a pale ash, leaden, or dove, with but trifling variegations. The parts about the mouth, neck, and belly, are of a clear white. The upper side of the pectoral fins, resembles the colour of the back; the lower partakes of the complexion of the belly.

The skin is free from scales, spines, and prickles; when stroked from head to tail it is remarkably smooth; when felt in the opposite direction there is a resistance so trifling, that it does not amount to a proper roughness.

Pectoral fins large, lunated, and strong. First dorsal stout and somewhat triangular, with a capacity, by means of a process behind, to be

raised and lowered a little like a latteen sail. Situated about the middle of the back. The second dorsal membranous, somewhat adipose, and of a rhomboidal figure. Two ventral fins, with their parallel processes, conceal the anus. An anal fin corresponding to the second dorsal.

The caudal fin very unequally divided ; the upper section being almost thrice as large as the lower, and having a process on the lower side.

The length of the individual from which this description is taken, was two feet nine inches. Breadth across from the tip of the pectoral fins, thirteen inches. Depth from the point of the dorsal, through the belly, nine. Girth, twelve and a half. Length of the longer division of the tail, eight. Is said to grow to two or three times this size.

Five lateral spiracles. Distance from the upper lip to the extremity of the nose, two inches and a half.

5. *White Shark.* (*Squalus carcharias.*) With snout somewhat blunt, and triangular serrated teeth.

Is sometimes caught within our waters ; being supposed to follow vessels coming from sea.

The teeth are triangular, with jagged edges ; and some of the points are a little awry, from the figure of an even or regular angle. They are commonly disposed in four rows, which are parallel, and which cover each other.

But on the subject of shark's teeth, I must observe, that they do not afford good characters to distinguish species ; for I have now lying before me, the jaws of a shark killed at sea, and presented to me by a ship-master, which contains both sorts of teeth, that is, the jagged and oblique triangular in the upper, and the oblong and sharp-pointed in the lower. But none of them have the minute side teeth which distinguished the the long-toothed shark, before described.

6. *Basking Shark*. (*Squalus maximus*.) Of a brownish lead colour above, whitish below, and small conic subulate very numerous teeth.

A shark of huge size, taken in considerable numbers near Province Town, Cape Cod, for the oil which his liver affords.

He is remarkable for having something within his mouth resembling the horny substance called *whale-bone*, which has led some persons to call him the *bone-shark*.

7. *Dog-fish*. (*Squalus canis*.) With small mouth, blunt teeth, the lower jaw shutting within the upper, and a tail almost straight.

Length, when full grown, four feet and more.

Colour leaden or ashen ; rather dark on the snout and back, but pale on the sides, and white upon the belly. Neither spots, stripes, nor spines, on any part. Sometimes the fins are tinged with red ; and the dorsals and caudal fringed behind with white.

Opening of the eye-lids oblong and horizontal. A nictitating membrane within the lower lid, capable of rising and excluding the light. Iris greenish yellow. Situation of the eyes, on the upper side of the head, half an inch or more from the edge of the snout. Immediately behind the eye, a hole or orifice, big enough to admit the end of a large probe.

Nostrils beneath the snout, capacious, with membranous covers and partitions.

Mouth small for a shark. Teeth blunt, and disposed after the manner of a file. The extremity of the lower jaw is toothed, and shuts within the teeth of the upper. Tongue white and scarcely rough.

Snout broad and blunt, but tapering rather toward a point, forward.

Two dorsal fins, of a somewhat triangular figure. The two ventrals, with their appendages, conceal the vent. Two anal fins, the foremost of which corresponds to the second dorsal, and the second is far back under the tail.

The tail is almost straight ; that is to say, it is not arched upwards so much as in many of the sharks. Its upper side, extremity, and lower margin, are invested with one surrounding fin. The ash colour of this is sometimes relieved by a blush of red beneath, a fringe of white behind, and tinge of dark at the very tip. .

The skin has no scales ; but a scratching roughness when rubbed from tail to head. Yet when felt from head to tail, the skin is smooth.

There is a semblance of a lateral line, and indeed of two, a part of the way.

A row of excretory ~~and~~ ^{osmotic} runs from the foremost gill-opening, toward the corner of the mouth. A great number more of these orifices on the lower side of the snout.

8. *Small blue Shark*. Grows to the length of four or five feet, and is often taken in our waters by the net, as he commonly bites off the line, if he is hooked.

It was on a female of this species of shark, that the observations were made which are inserted in the Medical Repository, vol. viii. p. 78. showing that the foetus of this animal connects in the most remarkable manner, oviparous animals with viviparous.

PEGASUS. DRAGON-FISH.

Generic character.

Snout elongated. Mouth beneath. Pectoral fins large. Ventral single rayed. Body depressed, mailed, and abdomen divided into bony segments.

Pegasus volans. (*Flying pegasus*.) The specimen I have of this singular fish, is from China ; yet I deem it proper to mention him here. In the jointed form of the body he resembles the syngnathus. In the

expanse of his wings he is allied to the *exocoetus* and *trigla*. He is a small fish not more than three inches long; and has a pointed snout rough at the edges.

AFTER all I have done on the subject of our ichthyology, I well know that many species remain unnoticed. Some of these I am acquainted with as a sportsman, though I have not as yet been able to examine them as a naturalist. Of others, I have the accounts stated to me by respectable observers, who are not zoologists. I cannot entertain a doubt that there are various kinds which I have neither seen nor heard of. I have reason to believe that the *cyprinus* or carp family, the *esox* or pike, and the *salmo* or trout, will be found to comprehend a considerable number of new sorts. When these shall come to hand, they may be described and arranged in the form of a supplement to the present memoir. And if at any future day, I should republish it in a distinct and separate tract, all the additional articles may be disposed in the places to which they respectively belong. I expect additional species to the genera of *squalus* and *raja*.

Important discoveries may be anticipated from the waters of the interior country, and especially from the lakes. For the person who shall be enabled to explore those regions, in a proper manner, there will be abundant employment, and a naturalist's reward.

I AVAIL myself of this opportunity to mention with respect, a Sicilian naturalist, who formerly resided in the United States, I mean Mr. C. S. RAFFINESQUE SCHMALTZ, whose botanical contributions have re-

peatedly enriched the pages of the Medical Repository. Since his removal from Philadelphia to Palermo, he has published, among other works, in the Italian tongue, a tract entitled, *Caratteri di alcuni nuovi generi et nuove specie di animali e piante delle Sicilia con varie osservazioni sopra i medesimi*; that is, characters of some new genera, and species of Sicilian animals and plants, accompanied with various observations. He has paid particular attention to the fishes in the Mediterranean, near the place of his residence; and has given figures and descriptions of fifty-nine species, which appear to him to have been overlooked by former writers.

It would scarcely seem possible, that so great a number of fishes, inhabiting that sea, should have remained unknown until the year 1810; and that the book, containing the plates, with the generic and specific marks of each, should have been so little noticed.

I take pleasure, as it lies before me, in giving a brief account of this able, though neglected performance. Immediately on his arrival at Palermo, he found there was much employment for a naturalist, in all the departments. Minerals, vegetables, and animals, each stood in need of illustration. For five years he employed himself with the greatest industry, in making journeys and excursions, and in procuring facts and specimens. The new information was so considerable and important, that he meditated an improved edition of CUPANI'S *Panphyton Siculum*, which was confined to plants, and converting it into a *Panphysis Sicula* that should embrace every sort of natural knowledge. He, however, abandoned that project, and determined to publish his zoölogical and botanical discoveries by themselves. It would hardly be expected, yet he declares it to be true, that he has discovered among the cetaceous animals, birds, amphibia, and fish, one hundred and seventy-eight new species, out of which he has found it necessary to constitute fifty-one new genera. A. B. Bernardi, one of the secretaries of state, has the

honour of the dedication ; and Mr. S. promises soon to publish his discoveries among the vermes, molluscas, testacea, crustacea, and insects of Sicily. In all these enterprises, I heartily wish him both emolument and fame.

WHILE engaged in this performance, I have endeavoured to innovate as little as possible, upon established system, by the erection of new genera. I have, nevertheless, been obliged to constitute a family under the order of thoracici, to receive and accomodate a fish, for whom I could not otherwise find a place in the class.

CENTRONOTUS. CRAB-EATER.

Generic Character.

Head broad and smooth. Under jaw projects beyond the other. Eight spines in front of the dorsal fin. Lower division of the tail shorter than the upper. Lateral line somewhat waving, and entering the caudal fin. Eyes far apart.

Crab-eater. (*Centronotus spinosus.*) With dusky back, silver-white sides, and milk-white belly.

The specimen now before me was bought in the New-York market, June 11th, 1815. The length was thirty-one inches ; breadth four ; and girth eleven. The weight was rather more than six pounds and a half. He had been caught in the bay a few hours before.

The halut and complexion at first glance, resembled, faintly, that of the big oceanic sucker ; (*echeneis neucrates* ;) but the difference was very perceptible on examination. The head was broad, flat, and smooth.

Not a knob, spine, or cirrhus, either on it, or on the chin or gill-covers. There were eight stout spines about a quarter of an inch long, and half an inch apart on the top of the back, in front of the dorsal fin. The form was such, that between the pectoral fins, the horizontal diameter was greatest ; yet altered so that at the commencement of the dorsal fin, the perpendicular diameter was most considerable. From this part, the body tapered away gently to the tail, which was lunated unequally, the upper segment being rather longer than the lower, and the distance between their extremities being about seven inches.

The dorsal fin began immediately behind the last of the before-mentioned spines, or a foot from the snout ; and it reached about the same distance toward the tail. The vent was nearly midway between the extremities ; and the anal fin reached about eight inches beyond it. Both the dorsal and anal ceased before they reached the tail.

The upper jaw was bluntly rounded. The lower jutted beyond the upper ; was rather lengthened, and less blunt. Both had distinct lips. The teeth were small, and resembled graters by their roughness. Gape of the mouth wide, and throat capacious. Both lips roughened by minute teeth. Three patches of teeth in the palate. Tongue broad, reddish, and in the middle cartilaginous, with an array of teeth upon it. Four pair of roundish cartilaginous patches, near the junction of the branchial arches, between the tongue and throat. In the throat itself, just in front of the gullet, two toothed patches above, and as many below. On these, the teeth rather longer and sharper than the rest.

The eyes were vertical on the sides of the head, and as much as three inches apart. Their colour whitish, with a tinge of yellow. About an inch in front of them, patulous double nostrils.

The general colour of the head, back, and tail, dorsal and caudal fins, dark brown, almost approaching to black. The inside of the pectorals of the same hue ; the outside a dirty white. Behind the pectorals com-

menced a silvery riband about an inch and a half wide, and extended to the tail. The chin, gill membrane, neck, belly, and lower sides of the ventral fins, excepting these tips, a milk white. The upper sides of the ventrals, which close to the body, dusky; and their extremities of the same complexion on both sides. The pectoral fins are pointed. Behind them, a black horizontal line or seam, two inches long.

The first five or six rays of the dorsal and anal fins, considerably longer than the rest. The ventrals are small, and situated very near each other.

The skin is covered with small adhering scales.

The lateral line runs from the upper part of the gill-opening, rising a little, and meandering a little, quite into the caudal fin, but terminates before it reaches the end of the tail.

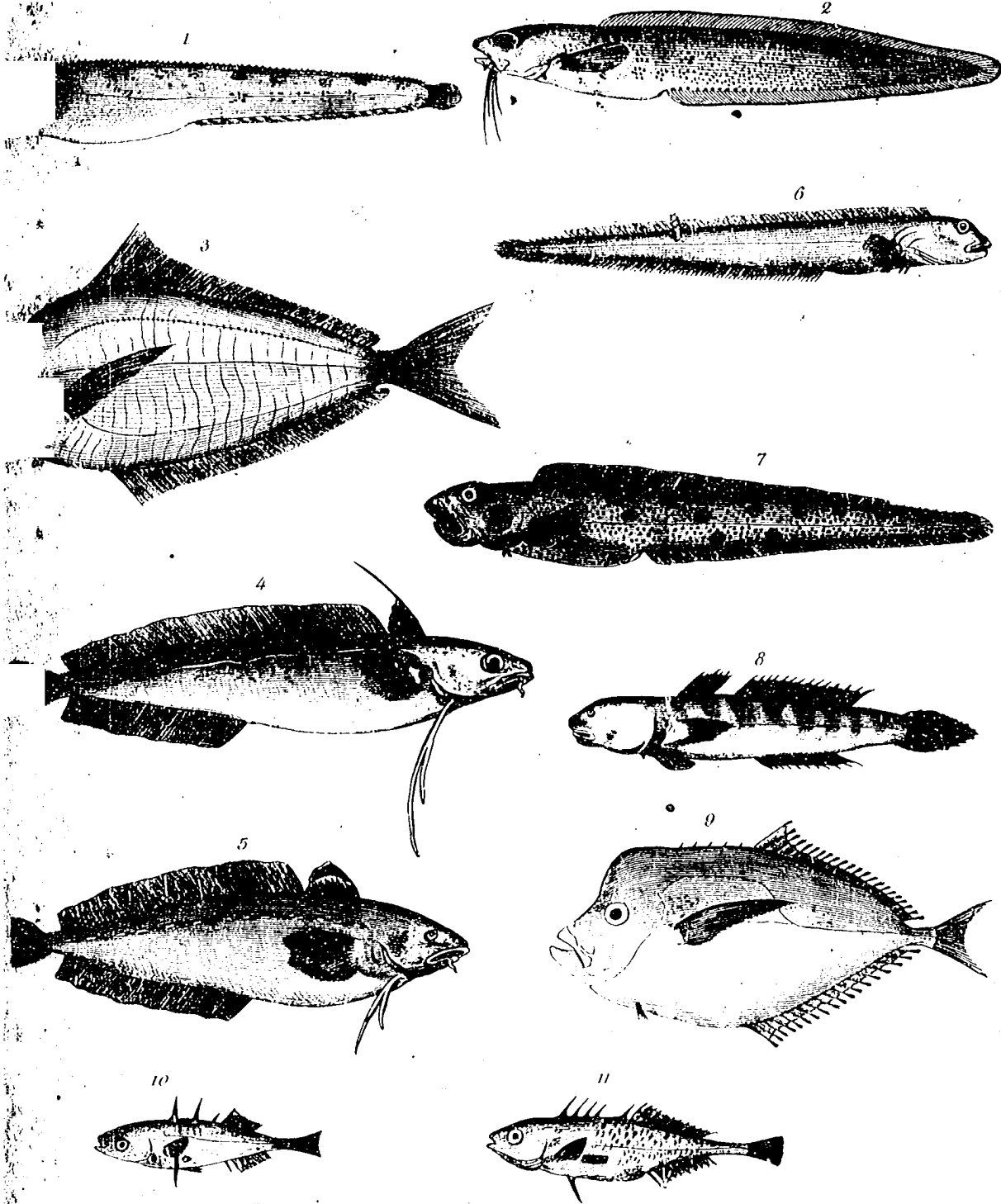
The rays in the fins are all soft, and in some of them difficult to be numbered; but as nearly as they can be ascertained, they are as follows, viz.

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On dissecting this fish, the most remarkable occurrence was the stomach distended with food, consisting of twenty spotted sand-crabs that were entire enough to be counted, and several young flounders.

This fish was boiled and served up at my table; on which occasion my family, servants and all, had but one opinion, that it was one of the best we had ever eaten.

*** THERE are some dates more recent than the reading of the memoir. These refer to certain articles which came to my knowledge since the paper was presented, and which it seemed improper to exclude.

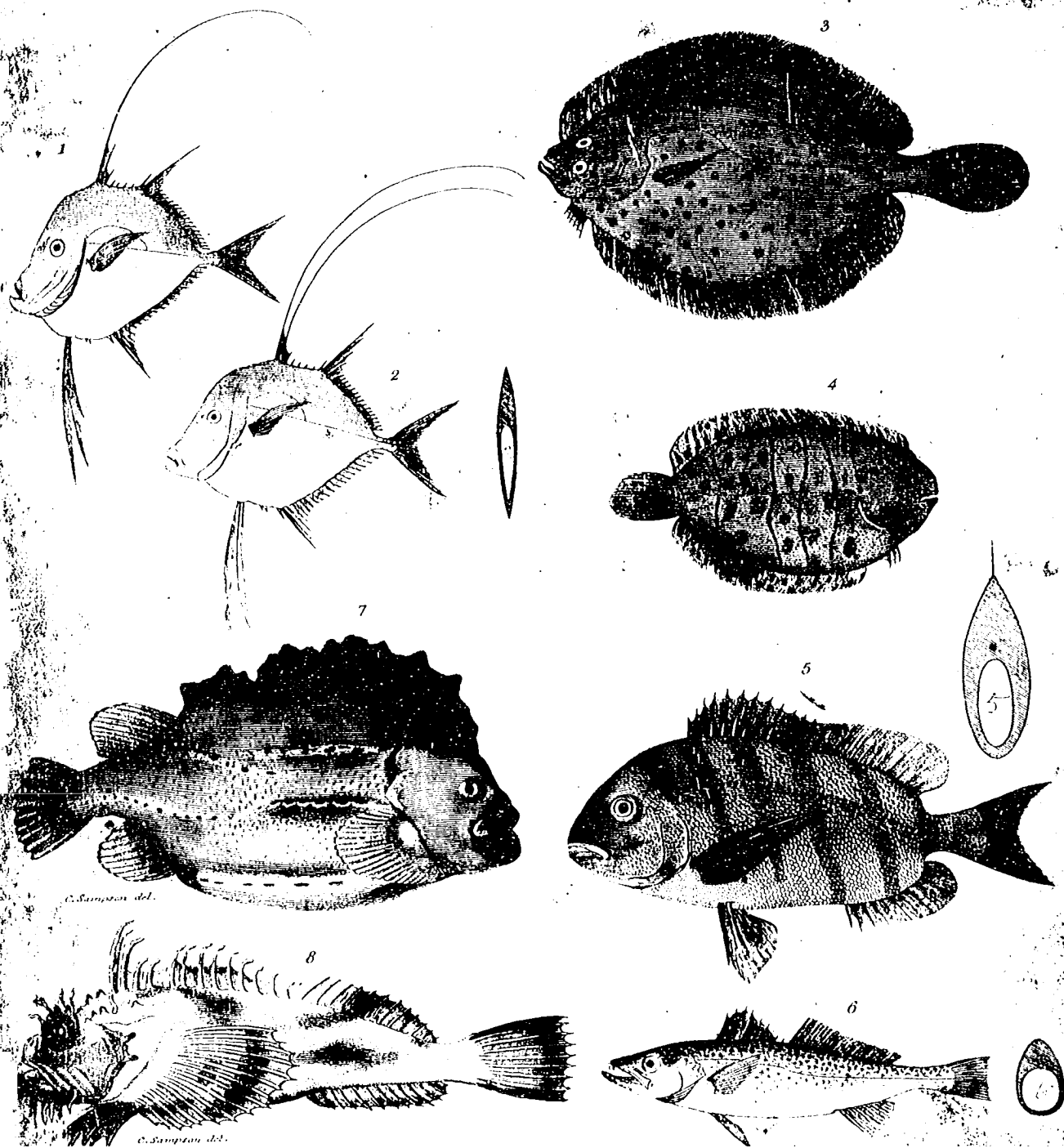


Spinous Ophidium.
 Cirrhous Ophidium.
 Cryptous Broadshiner.
 Galling.

5. Dotted Cod.
 6. Fringed Blenny.
 7. Large-tipped Blenny.
 8. Variegated Goby.

9. Bristly Dory.
 10. Two-spined Stickleback.
 11. Four-spined Stickleback.

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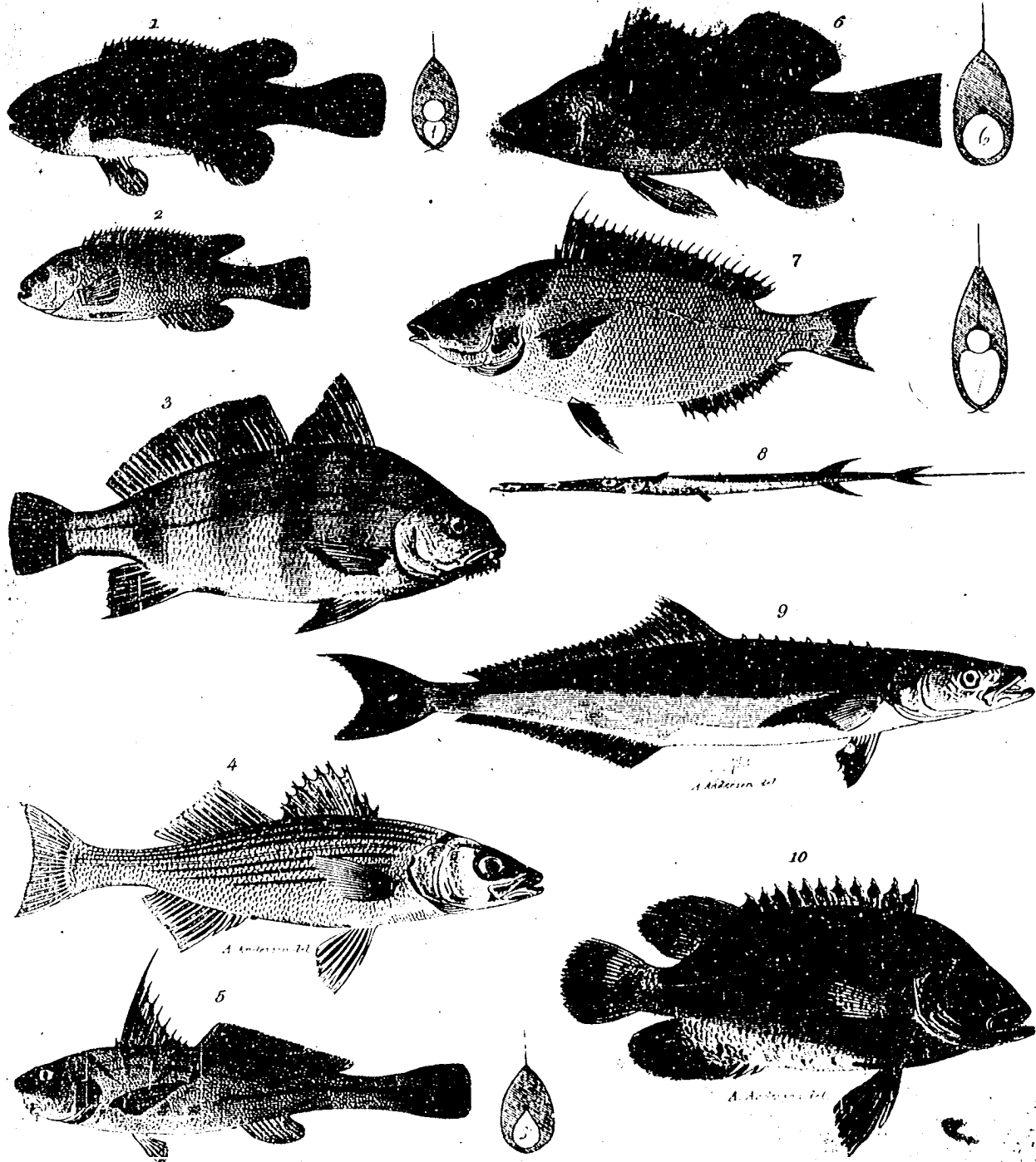


1. Rostrated Dory.
2. Hair-finned Dory.

3. Plaice of New-York.
4. New-York Sole.

5. Sheepshead.
6. Weakfish.

7. Blue Lumpfish.
8. Yellow Scoopnose.



1. Blackfish or Tautog.
2. Bergall or Chogset.
3. Grunts or Young Drum.

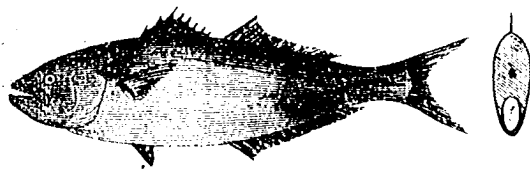
4. Striped Bass or Rockfish.
5. King-fish.

6. Sea Bass or Black Harry.
7. Big Porgy.
8. New-York Trumpet-fish.
9. Centronotus or Crabeater.

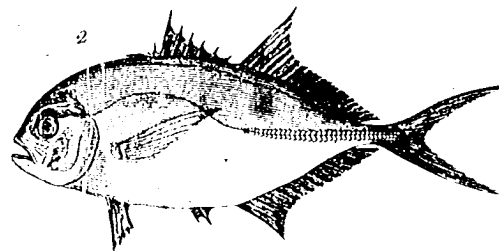
10. Triple-tailed or Black Perch.

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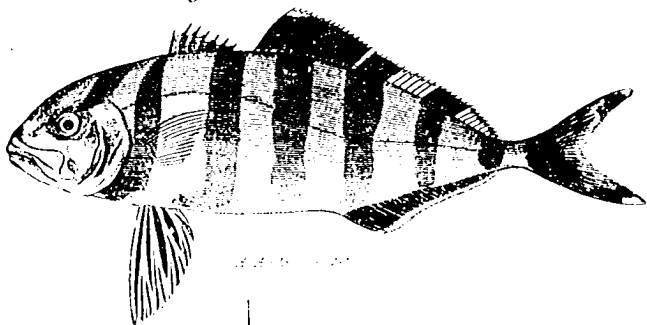
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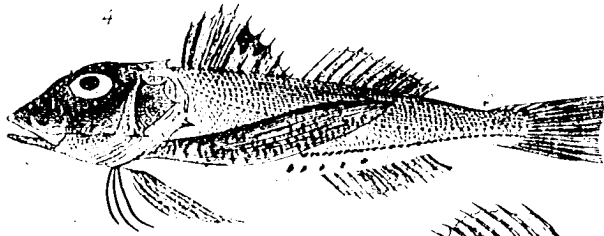
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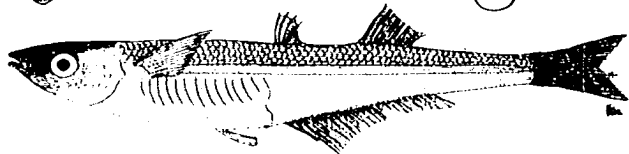
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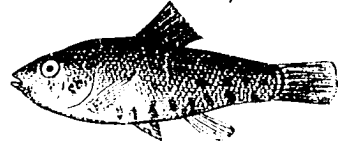
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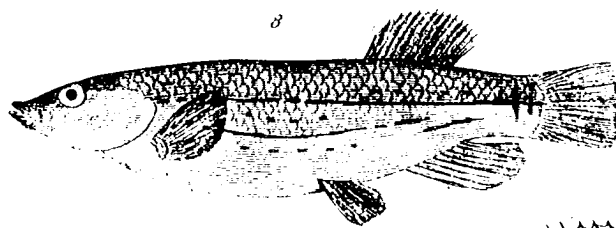
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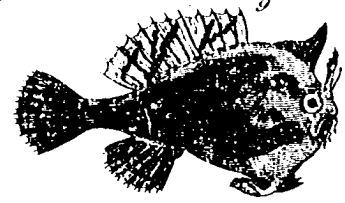
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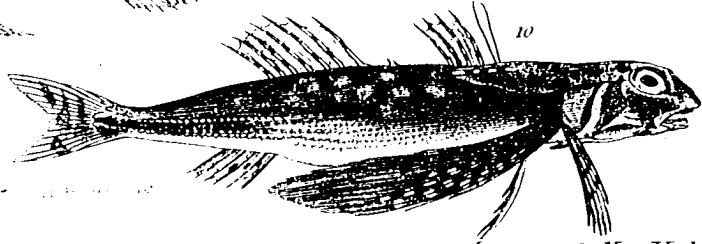
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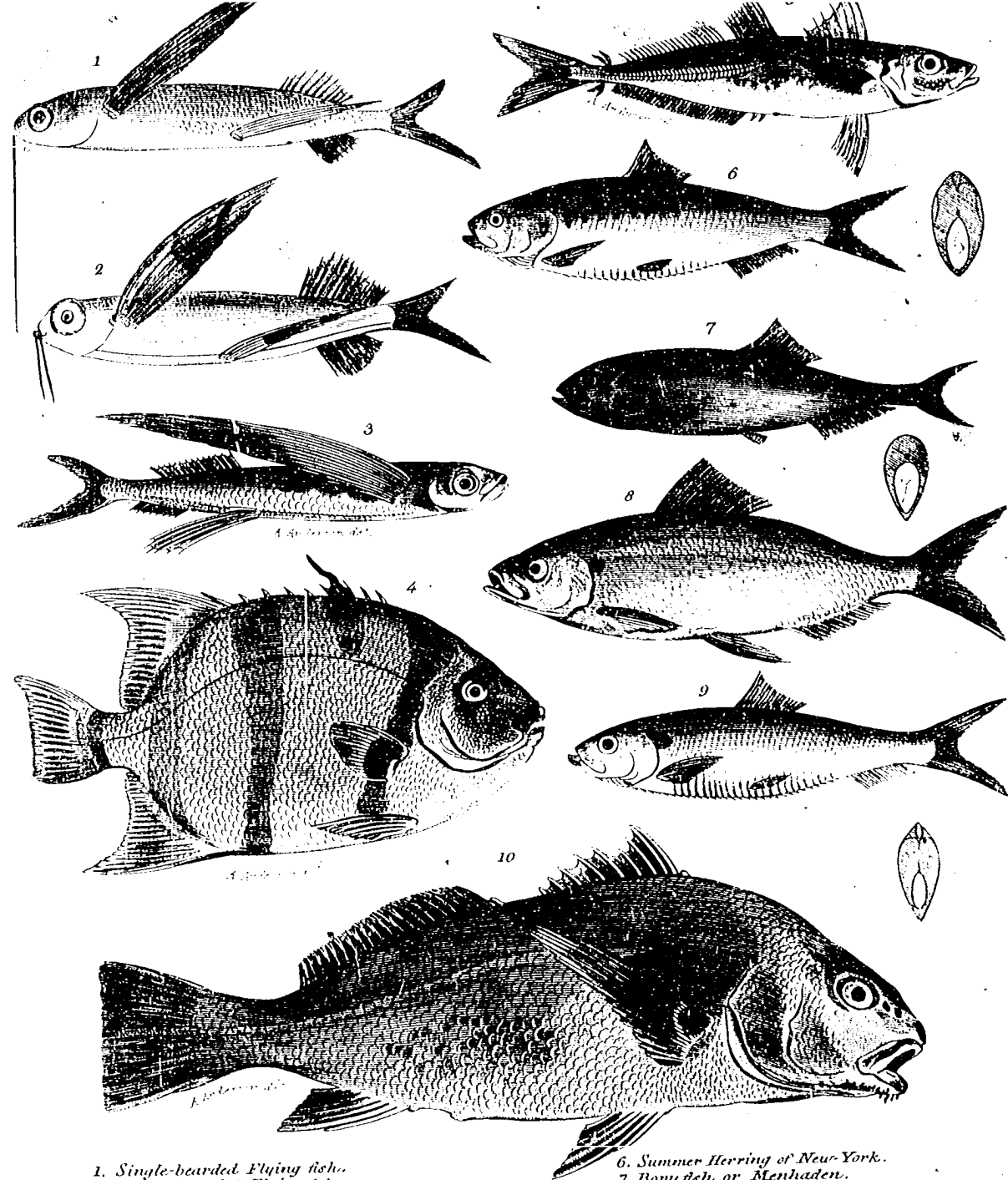


1. Horse Mackerel, or *Scomber plumbeus*.
 2. Yellow Mackerel, or *S. chrysos*.
 3. Banded Mackerel, or *S. zonatus*.
 4. Sea Robin, or *Trigla lineata*.

5. Web-fingered Gurnard.
 6. Small Silverside, or *Atherina notata*.
 7. Sheephead Killifish, or *Esox ovinus*.

8. New-York Gudgeon, or *Esox flavulus*.
 9. Mouse-fish, or *Lophius gibbus*.
 10. Star-rayed Polynema.

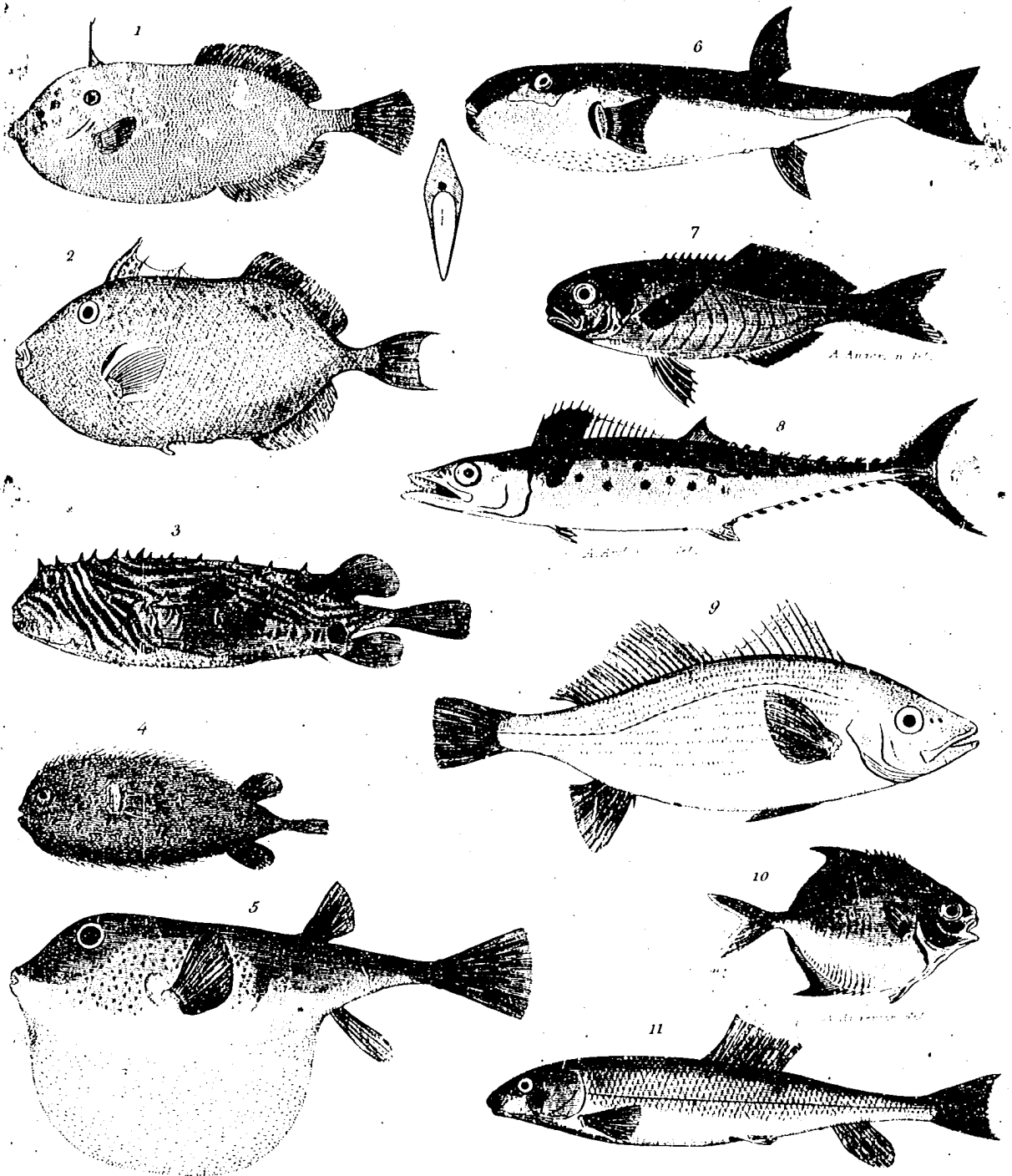
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1. Single-bearded Flying fish.
2. Double-bearded Flying fish.
3. New-York Flying fish.
4. Cloudy Chaetodon.
5. Hippos Mackerel.

6. Summer Herring of New-York.
7. Bony fish or Menhaden.
8. Fall Herring or Long-Island Herring.
9. Spring Herring or Alewife or New-York.
10. Red Drum or *Sciaenops Gigas*.

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1. Orange Balistes.
2. Trigger-fish, Balistes.
3. Spot-striped Diodon.
4. Hairy Diodon.

5. Puffer or Toad-fish, Tetrodon.
6. Mathematical Tetrodon.
7. Rudder fish or perch Coryphæna.
8. Spanish Mackerel.

9. Silvery Perch.
10. Spinous Dory.
11. Fresh water Sucker or Cyprinus teres.

A. Anderson sc.