BRITISH ZOOLOGY.

CLASS III. REPTILES

IV. FISH.

LONDON.
Printed for Benj. White,
M. D. C. C. L. XXVI.
BRITISH ZOOLOGY.

V O L. III.

C l a s s I I I. R E P T I L E S.

I V. F I S H.

W A R R I N G T O N:

P R I N T E D B Y W I L L I A M E Y R E S,
F O R B E N J A M I N W H I T E, A T H O R A C E'S H E A D,
F L E E T - S T R E E T, L O N D O N.

M D C C L L X X V I.
## PLATES TO BRITISH ZOOLOGY:

**VOL. III. OCTAVO.**

Plates:

**FRONTISPIECE,** **Roach,** to face the Title

<table>
<thead>
<tr>
<th>Plate</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Coriaceous Tortoise</td>
<td>7</td>
</tr>
<tr>
<td>II. Brown Lizard</td>
<td>21</td>
</tr>
<tr>
<td>Scaly Lizard</td>
<td></td>
</tr>
<tr>
<td>III. Warty Lizard</td>
<td>23</td>
</tr>
<tr>
<td>IV. Viper</td>
<td>26</td>
</tr>
<tr>
<td>Blind Worm</td>
<td></td>
</tr>
<tr>
<td>Ringed Snake</td>
<td></td>
</tr>
<tr>
<td>V. Explanation of Technical Terms</td>
<td>46</td>
</tr>
<tr>
<td>VI. Blunt-headed Cachalot</td>
<td>61</td>
</tr>
<tr>
<td>VII. Teeth of Cetaceous Fish</td>
<td>62</td>
</tr>
<tr>
<td>VIII. Lampries</td>
<td>76</td>
</tr>
<tr>
<td>IX. Skate</td>
<td>82</td>
</tr>
<tr>
<td>X. Electric Ray</td>
<td>89</td>
</tr>
<tr>
<td>XI. Thornback</td>
<td>93</td>
</tr>
<tr>
<td>XII. Thornback-Underside</td>
<td>93</td>
</tr>
<tr>
<td>*XII. Angel Shark</td>
<td>98</td>
</tr>
<tr>
<td>XIII. Basking Shark</td>
<td>101</td>
</tr>
<tr>
<td>XIV. Long-tailed Shark</td>
<td>110</td>
</tr>
<tr>
<td>XV. Greater and Lesser Spotted Sharks</td>
<td>115</td>
</tr>
<tr>
<td>XVI. Smooth Shark</td>
<td>116</td>
</tr>
</tbody>
</table>

Vol. III. a XVII.
Plates.

XVII. Beaumaris Shark - Page 118
XVIII. Common Angler - 120
XIX. Oblong Diodon
  Short Diodon - 124
  Sturgeon
XX. Globe Diodon - 132
XXI. Lump Sucker
  Unctuous Sucker
XXII. Bimaculated Sucker
  Jura Sucker
XXIII. Pipe Fish - 138
XXIV. Wolf Fish - 151
XXV. Morris
  Launce
XXVI. Sword Fish - 160
XXVII. Dragonet - 164
XXVIII. Dragonet
  Common Weever
XXIX. Greater Weever - 171
XXX. Poor
  Bib
XXXI. Forked Hake
  Coal Fish
XXXII. Trifurcated Hake - 196
XXXIII. Five-bearded Cod
  Three-bearded Cod
XXXIV. Torsk - 203
XXXV. Gattorugine
  Crested Blenny
  Spotted Blenny

XXXVI.
<table>
<thead>
<tr>
<th>Plate</th>
<th>Fish Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>XXXVI</td>
<td>Smooth Blenny</td>
<td>208</td>
</tr>
<tr>
<td>XXXVII</td>
<td>Viviparous Blenny</td>
<td>211</td>
</tr>
<tr>
<td></td>
<td>Spotted Goby</td>
<td></td>
</tr>
<tr>
<td>XXXVIII</td>
<td>Black Goby</td>
<td>213</td>
</tr>
<tr>
<td>XXXIX</td>
<td>Armed Bullhead</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>River Bullhead</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Father Lasher</td>
<td>218</td>
</tr>
<tr>
<td>XLI</td>
<td>Smear Dab</td>
<td>221</td>
</tr>
<tr>
<td></td>
<td>Doree</td>
<td></td>
</tr>
<tr>
<td>XLII</td>
<td>Lunulated Gilt Head</td>
<td>223</td>
</tr>
<tr>
<td></td>
<td>OPAH</td>
<td></td>
</tr>
<tr>
<td>XLIII</td>
<td>Toothed Gilt Head</td>
<td>243</td>
</tr>
<tr>
<td>XLIV</td>
<td>Ballan</td>
<td>246</td>
</tr>
<tr>
<td>XLV</td>
<td>Striped Wrasse</td>
<td>249</td>
</tr>
<tr>
<td>XLVI</td>
<td>Gibbous Wrasse</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>Trimaculuated Wrasse</td>
<td></td>
</tr>
<tr>
<td>XLVII</td>
<td>Comber Wrasse</td>
<td>251</td>
</tr>
<tr>
<td></td>
<td>Antient Wrasse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Goldsinny</td>
<td></td>
</tr>
<tr>
<td>XLVIII</td>
<td>Perch</td>
<td>254</td>
</tr>
<tr>
<td></td>
<td>Sea Perch</td>
<td></td>
</tr>
<tr>
<td>XLIX</td>
<td>Basse</td>
<td>257</td>
</tr>
<tr>
<td></td>
<td>Sticklebacks</td>
<td>261</td>
</tr>
<tr>
<td>LI</td>
<td>Scad</td>
<td>264</td>
</tr>
<tr>
<td></td>
<td>Mackrel</td>
<td></td>
</tr>
<tr>
<td>LII</td>
<td>Tunny</td>
<td>266</td>
</tr>
<tr>
<td>LIII</td>
<td>Striped Surmullet</td>
<td>274</td>
</tr>
<tr>
<td>LIV</td>
<td>Grey Gurnard</td>
<td>276</td>
</tr>
<tr>
<td>LV</td>
<td>Piper</td>
<td>279</td>
</tr>
<tr>
<td>LVI</td>
<td>Sapphirine Gurnard</td>
<td>280</td>
</tr>
<tr>
<td>LVII</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plate</td>
<td>Image</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>LVII.</td>
<td>Red Gurnard</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Streaked Gurnard</td>
<td>7</td>
</tr>
<tr>
<td>LVIII.</td>
<td>Salmon</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Loche</td>
<td>7</td>
</tr>
<tr>
<td>LIX.</td>
<td>Samlet</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Trout</td>
<td>7</td>
</tr>
<tr>
<td>LX.</td>
<td>Charr</td>
<td>3</td>
</tr>
<tr>
<td>LXI.</td>
<td>Grayling</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Smelt</td>
<td>3</td>
</tr>
<tr>
<td>LXII.</td>
<td>Gwiniad</td>
<td>3</td>
</tr>
<tr>
<td>LXIII.</td>
<td>Pike</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Sea Pike</td>
<td>3</td>
</tr>
<tr>
<td>LXIV.</td>
<td>Saury</td>
<td>3</td>
</tr>
<tr>
<td>LXV.</td>
<td>Argentine Atherine</td>
<td>3</td>
</tr>
<tr>
<td>LXVI.</td>
<td>Mullet</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Parr</td>
<td>3</td>
</tr>
<tr>
<td>LXVII.</td>
<td>Flying Fish</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Anchovy</td>
<td>3</td>
</tr>
<tr>
<td>LXVIII.</td>
<td>Pilchard</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Herring</td>
<td>3</td>
</tr>
<tr>
<td>LXIX.</td>
<td>White Bait</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Shad</td>
<td>3</td>
</tr>
<tr>
<td>LXX.</td>
<td>Carp</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Bream</td>
<td>3</td>
</tr>
<tr>
<td>LXXI.</td>
<td>Barbel</td>
<td>3</td>
</tr>
<tr>
<td>LXXII.</td>
<td>Crusian</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Rud</td>
<td>3</td>
</tr>
<tr>
<td>LXXIII.</td>
<td>Chub</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Bleak</td>
<td>3</td>
</tr>
</tbody>
</table>
All the works of the Lord are good, and he will give every needful thing in due season.

So that a man cannot say this is worse than that, for in time they shall all be well approved.

Ecclesiasticus xxxix. 33, 34.
REPTILES.

We are now to consider the class of Reptiles, which are, for the most part, objects of detestation; but however the opinion of the world may be, if a writer undertakes a general history of animals, he must include them: they form at left one link in the chain of beings, and may therefore be viewed with a degree of pleasure by a philosophic eye.

But notwithstanding the prejudice against this class is almost universal, is it founded on reason? In some it may be owned that the outward form is disagreeable, while the noxious qualities of others are justly productive of terror: but are we on that account to reject them? The more fatal they are, the more deeply we should enquire into their effects, that we may be capable of relieving those who are sufferers, and secure others from the same misfortune. But if we duly weigh their noxious qualities, we shall, with our moral poet, find

"All partial evil universal good."

B 2
REPTILES.

The teeth of wild beasts, and of serpents, are not only created as instruments of vengeance, but are salutary in lessening the numbers of those animals which are highly useful in the degree, and only hurtful in their excess; but if their bad qualities are serviceable, we are more indebted to their good ones than we choose to acknowledge.

But many of the animals that form this class are of immediate benefit to mankind. The Turtle, or Sea-Tortoise, supplies the torrid zone with a wholesome and delicious food, as the epicures of our own country can attest. Frogs are a food in several parts, as Lizards and Serpents are in others. The medicinal virtues of the Viper are partly exploded by the moderns, but time, the overthrower of systems, as well as empires, may restore it to the rank it held with the antients. The Lacerta Scincus is, however, yet esteemed in the East for its salubrious qualities, and even Toads have contributed to the ease of patients in the most inveterate of all diseases.

Had I followed Linnaeus, and included the Cartilaginous Fish in this class, there would have been ample room for panegyric, for it is very doubtful whether any are pernicious; but the use of many, either as food or for mechanical purposes, were never questioned.

But if the external figure of the reptile tribe is disgusting, they have one general beauty, an apt configuration of parts for their way of life, nor
REPTILES.

are they destitute of their peculiar graces: the fine disposition of plates in the shell of the Tortoise, with the elegant symmetry of their colors, must strike even common observers, while the eye of the despised Toad has a lustre denied to more pleasing forms. The frolicsome agility of Lizards enlivens the dried banks in hot climates; and the great affection which some of them shew to mankind, should farther engage our regard and attention.

The wreathing of the snake, with the vivid die of its skin, are certainly graceful, tho' from the dread of some particular species which are venomous, we have acquired an antipathy for the whole. The antients, who considered the Serpent as an emblem of health, could associate pleasing ideas with this animal. We therefore find it an ornament at every entertainment, and in every scene of mirth, both in painting and in sculpture. Virgil adopted this notion, and has accordingly described it with every beauty both of form and color,

Adytis cum lubricus anguis ab imis
Septem ingens gyros, septena volumina traxit;
Amplexus placide tumulum, lapsusque per aras:
Cerulaeae cui terga notae, maculosus et auro
Squamam incendebat fulgor; ceu nubibus arcus
Mille trahit varios adverso sole lineores.

V. 84.
REPTILES.

From the deep tomb, with many a shining fold,
An azure serpent rose, in scales that flam'd with gold:
Like heaven's bright bow his varying beauties shone
That draws a thousand colors from the sun:
Pleas'd round the altars and the tomb to wind,
His glittering length of volumes trails behind.

Pitt.

But if after all some lively writer should pursue the Naturalists with more wit than argument, and more humor than good-nature, it should be endured with patience. Ridicule is, however, not the test of truth, tho' when joined to satyr, it seldom fails of seducing the many who would rather laugh than think. Should this prove the case in the present instance, let the author be allowed to screen himself from censure, by saying he writes not to the many, but the few; to those alone who can examine the parts with a view to the whole, and who scorn to despise even the most deformed, or the most minute work of an all-wise Creator.

GENERA.

I. TORTOISE.
II. FROG.
III. LIZARD.
IV. SERPENT.
CORIACEOUS TORTOISE.
CLASS III.

REPTILES.

Body covered either with a shell or strong hide, divided by futures; four fin-like feet; a short tail.

***TORTOISE***

Testudo coriacea five Mercureii. Rondel. 450? Gesner pise. 946?
Testudo coriacea? Testudo pedibus pinniformibus mus-
tieis, testa coriacea, cauda i. Coriace-
angulis septem exaratis. Lin. fift. 350.

THIS species is common to the Mediterranean, and to our southern seas, and is not, as far as we know, discovered in any other.

Two were taken on the coast of Cornwall in the mackrel nets, of a vast size, a little after Midsummer 1756; the largest weighed eight hundred pounds, the lesser near seven hundred. A third, of equal weight with the first, was caught on the coast
CORIACEOUS TORTOISE. Class III.

coast of Dorsetshire, and deposited in the Leverian Museum.

The length of the body is four feet ten inches; of the head nine inches and a half; of the neck three; or of the whole five feet twelve. The upper jaw bifurcated at the end: the extremity of the lower sharp, clasping into the fork of the upper. The nostrils small and round.

The breadth of the body in the largest part is three feet. The length of the fore fins two feet seven: of the hind thirteen inches and a half: are smooth, grow pointed to the extremity, and are destitute of toes. These fins are stuffed: perhaps the bones might have been taken out; for in the figure given by Rondeletius, which agrees in all other respects with this species, there is appearance of toes, and even nails.

The body is covered with a strong hide, exactly resembling black leather, destitute of scales, but marked with the appearance. The back is divided into five longitudinal flutings or grooves, with as many sharp but smooth risings.

This species is said to be extremely fat: but the flesh coarse and bad *, according to the report made by writers who had opportunity of tasting them in the Mediterranean sea. I am informed that the Carthubians will eat no other than this species.

* Rondeletius. Buffet.
Body naked.
Four legs, the feet divided into toes.
No tail.

So common and well-known an animal requires no description; but some of its properties are so singular, that we cannot pass them unnoticed.

Its spring or power of taking large leaps is remarkably great, and it is the best swimmer of all four-footed animals. Nature hath finely adapted its parts for those ends, the fore members of the body being very lightly made, the hind legs and thighs very long, and furnished with very strong muscles.

While in a tadpole state, it is entirely a water animal; the work of generation is performed in that element, as may be seen in every pond during spring.
The work of propagation is extremely singular, it being certain that the frog has not a penis intran; there appears a strong analogy in this case between a certain class of the vegetable kingdom and those animals; for it is well known, that when the female frog deposits its spawn, the male instantaneously impregnates it with what we may call a farina fecundans, in the same manner as the male Palm tree conveys fructification to the flowers of the female, which would otherwise be barren.

As soon as the frogs are released from their tadpole state, they immediately take to land; and if the weather has been hot, and there fall any refreshing showers, you may see the ground for a considerable space perfectly blackened by myriads of these animalcules, seeking for some secure lurking places. Some philosophers† not giving themselves time to examine into this phenomenon, imagined them to have been generated in the clouds, and showered on the earth; but had they, like our Derham‡, but traced them to the next pool, they would have found a better solution of the difficulty.

As frogs adhere closely to the backs of their own species, so we know they will do the same by fish: Walton§ mentions a strange story of their destroying

---

† Rondletius, 216. Wormii Mus. 327.
‡ Ray's Wisdom Creat. 316. § Complete Angler, 161.
ing pike; but that they will injure, if not entirely kill carp, is a fact indisputable, from the following relation: a very few years ago, on fishing a pond belonging to Mr. Pit, of Encomb, Dorsetshire, great numbers of the carp were found each with a frog mounted on it, the hind legs clinging to the back, the fore legs fixed in the corner of each eye of the fish, which were thin, and greatly wasted, seized by carrying so disagreeable a load. These frogs we imagine to have been males disappointed of a mate.

The croaking of frogs is well known, and from that in fenny countries they are distinguished by ludicrous titles, thus they are styled Dutch Nightingales and Boston Waites; even the Stygian frogs have not escaped notice, for Aristophanes hath gone farther, and formed a chorus of them.

Yet there is a time of year when they become mute, neither croaking nor opening their mouths for a whole month: this happens in the hot season, and that is in many places known

* Comedy of the Frogs.
to the country people by the name of the *Paddock Moon*. I am informed that for that period, their mouths are so closed, that no force (without killing the animal) will be capable of opening them.

*Morton* endeavours to find a reason for their silence, but tho' his facts are true, he is unfortunate in his philosophy. Frogs are certainly endowed (as he well observed) with a power of living a good while under water without respiration, which is owing to their lungs being composed of a series of bladders: but he mistakes the nature of air, when he affirms that they receive a quantity of cool air, and dare not open their mouths for a month, from a dread of admitting a warmer into their lungs. It is hardly necessary to say, that in whatever state the air was received, it would assimilate itself to the external atmosphere in a short time. We must leave the fact to be accounted for by farther experiments. But from what we do know, we may partly vindicate *Theophrastus*, and other antients, about the silence of the frogs at *Seriphus*. That philosopher affirms it, but ascribes it to the coldness of the waters in that island: Now when Monsieur *Tournefort* was there, the waters were lukewarm, and the frogs had recovered their voices †. Is it not probable that *Theophrastus* might be at *Seriphus* at that season when the frogs were mute, and having never observed it elsewhere,

*Hist. Northampt.* 441.
† *Tournefort's voy.* I. 142.
might conclude their silence to be general as to the time, but particular as to the place. Ælian*, who quotes Theophrastus for the last passage, ascribes the same silence to the frogs of the lake Pierus in Thessaly, and about Cyrene in Africa: but he is so uncertain a writer, that we cannot affirm whether the species of the African frogs is the same with ours.

These, as well as other reptiles, feed but a small space of the year. The food of this genus is flies, insects, and snails. Toads are said to feed also on bees, and to do great injury to those useful insects.

During winter frogs and toads remain in a torpid state: the last of which will dig into the earth, and cover themselves with almost the same agility as the mole.

Rana gibbosa. Gesner p. 809.

This differs from the former in having a high protuberance in the middle of the back, forming a very sharp angle. Its colors are also more vivid, and its marks more distinct; the ground

* Ælian, Lib. III. ch. 35, 37.
color being a pale or yellowish green, marked with rows of black spots from the head to the rump.

This and, we think, the former, are eaten. We have seen in the markets at Paris whole hampers full, which the vendors were preparing for the table, by skinning and cutting off the foreparts, the loins and legs only being kept. Our strong dislike to these reptiles, prevented a close examination into the species.

THE most deformed and hideous of all animals; the body broad, the back flat, and covered with a pimply dusky hide; the belly large, swagging, and swelling out; the legs short, and its pace labored and crawling: its retreat gloomy and filthy: in short, its general appearance is such as to strike one with disgust and horror; yet we have been told by those who have resolution to view it with attention, that its eyes are fine: to this it seems
seems that Shakespeare alludes, when he makes his Juliet remark,

Some say the lark and loathed toad change eyes.

As if they would have been better bestowed on so charming a songster than on this raucous reptile.

But the hideous appearance of the toad is such as to make this one advantageous feature overlooked, and to have rendered it in all ages an object of horror, and the origin of most tremendous inventions. Ælian* makes its venom so potent, that Basilişk-like, it conveyed death by its very look and breath; but Juvenal is content with making the Roman ladies, who were weary of their husbands, form a potion from its entrails†, in order to get rid of the good man.

Occurrit Matrona potens, quaë molle Calenum Porreštura viro miscet sitiente rubetam. Sat. I. 68.

To quench the husband's parching thirst, is brought
By the great Dame, a most deceitful draught;
In rich Calenian wine she does infuse,
(To ease his pains) the toad's envenom'd juice.

This opinion begat others of a more dreadful nature; for in after-times superstition gave it preternatural powers, and made it a principal ingredient in the incantations of nocturnal hags:

* Hist. an. lib. ix. c. 11.
Toad that under the cold stone,
Days and nights has, thirty-one,
Swellter'd venom sleeping got,
Boil thou, first i'th' charmed pot.

We know by the poet that this charm was intended for a design of the first consideration, that of raising the dead from their repose, and bringing before the eyes of Macbeth a hateful second-fight of the prosperity of Banquo's line.

This shews the mighty powers attributed to this animal by the dealers in the magic art; but the powers our poet indues it with, are far superior to those that Gesner ascribes to it: Shakespeare's witches used it to disturb the dead; Gesner's, only to still the living, Ut vim coeundi ni fallor, in viris tollerent.*

We may add here another superstitition in respect to this animal: it was believed by some old writers to have a stone in its head, fraught with great virtues medical and magical: it was distinguished by the name of the Reptile, and called the Toad-Stone, Bufonites, Crapaudine, Krottenstein†; but all its fancied powers vanished on the discovery of its being nothing but the fossil tooth of the sea-wolf, or of some flat-toothed fish, not unfrequent in our island, as well as several other countries; but we may well excuse this tale, since Shakespeare has extracted from it a simile of uncommon beauty:

* Hist. quad. ovip. 72.
† Boet. de Boot. de Lap. et Gem. 301. 303.
Class III.  T O A D.

Sweet are the uses of adversity,
Which, like the toad, ugly and venomous,
Wears yet a precious jewel in his head.

But these fables have been long exploded: we shall now return to the notion of its being a poisonous animal, and deliver, as our opinion, that its excessive deformity, joined to the faculty it has of emitting a juice from its pimples, and a dusky liquid from its hind parts, is the foundation of the report.

That it has any noxious qualities we have been unable to bring proofs in the smallest degree satisfactory, though we have heard many strange relations on that point.

On the contrary, we know several of our friends who have taken them in their naked hands, and held them long without receiving the least injury: It is also well known that quacks have eaten them, and have besides squeezed their juices into a glass, and drank them with impunity.

We may say also, that these reptiles are a common food to many animals; to buzzards, owls, Norfolk plovers, ducks, and snakes, who would not touch them were they in any degree noxious.

So far from having venomous qualities, they have of late been considered as if they had beneficent ones. We wish, for the benefit of mankind, that we could make a favorable report of the many attempts of late to cure the most terrible of diseases
the cancer, by the application of live toads; but, alas, they seem only to have rendered a horrible complaint more loathsome. My enquiries on this subject, and some further particulars relating to the history of this animal, may be found in the Appendix.

In a word, we may consider the toad as an animal that has neither good nor harm in it; that being a defenceless creature, nature had furnished it, instead of arms, with a most disgusting deformity, that strikes into almost every being capable of annoying it, a strong repugnancy to meddle with so hideous and threatening an appearance.

The time of their propagation is very early in the spring: at that season the females are seen crawling about oppressed by the males, who continue on them for some hours, and adhere so fast as to tear the very skin from the parts they stick to. They spawn like frogs; but what is singular, the male affords the female obstetrical aid, in a manner that will be described in the Appendix.

To conclude this account with the marvellous, this animal is said to have often been found in the midst of solid rocks, and even in the centre of growing trees, imprisoned in a small hollow, to which there was not the least adit or entrance*: how the animal breathed, or how it subsisted (supposing the possibility of its confinement) is past

* Plot's Hist. Staff. 247.
our comprehension. *Plot's* solution of this phenomenon is far from satisfactory; yet as we have the great *Bacon's* † authority for the fact, we do not entirely deny our assent to it.

---


R. corpore verrucoso, ano

**THIS species frequents dry and sandy places:**

it is found on *Putney Common*, and also near *Revesby Abby, Lincolnshire*, where it is called the *Natter Jack*. It never leaps, neither does it crawl with the slow pace of a toad, but its motion is liker to running. Several are found commonly together, and, like others of the genus, they appear in the evenings.

The upper part of the body is of a dirty yellow, clouded with brown, and covered with porous pimples, of unequal sizes: on the back is a yellow line.

The upper side of the body is of a paler hue, marked with black spots, which are rather rough.

On the fore feet are four divided toes; on the hind five, a little webbed.

The length of the body is two inches and a quar-

* P. 249.
† *Nat. Hist. Cent. vi. Exp. 570.*

C 2 ter;
GREAT FROG. Class III.

ter; the breadth, one and a quarter: the length of the fore legs one inch one-sixth; of the hind legs, two inches.

We are indebted to Joseph Banks, Esq; for this account.

6. Great. INHABITS the woods near Loch Ranza, in the Isle of Arran.

Is double the size of the common frog: the body square: belly great: legs short: four toes on the fore-feet, four and a thumb to the hind; the second outmost toe the longest. The color above, is a dirty olive, marked with great warty spots; the head alone plain. The color beneath whitish.

It leaped slowly.
Slender naked body: four legs:
Divided toes on each:
Very long tail.

*Plot's Hist. Staff. 252. tab. 22.*

Lacerta, Gronov. *Zooph. No. 60.*
Padzher pou. *Borlaf Caswall, 284. tab. 28.*

Those we have seen differ in color, but agree in all other respects with the species described by Doctor Plot. Their length from the nose to the hind-legs was three inches; from thence to the end of the tail three and three quarters.

Along the back was a black lift; each side of that a brown one: then succeeded a narrow stripe, spotted alternately yellow and brown; beneath that a broad black one; those ended a little beyond the hind-legs. The belly was yellow, and the scales large but even. The scales on the back small; on the tail the ends projected: those on the latter were varied with black and brown.

C3 The
SCALY LIZARD. Class III.

The legs and feet were dusky; on each foot were five toes, furnished with claws.

This species is extremely nimble: in hot weather it basks on the sides of dry banks, or of old trees; but on being observed immediately retreats to its hole.

The food of this species, as of all the other English lizards, is insects: they themselves of birds of prey. Each of our lizards are perfectly harmless; yet their form is what strikes one with disgust, and has occasioned great obscurity in their history.

Related to this species is the Guernsey lizard, which we are informed has been propagated in England from some originally brought from that island. We have also heard of a green lizard frequent near Farnham, which probably may be of that kind: but the most uncommon species we ever met with any account of, is that which was killed near Woscot, in the parish of Swinford, Worcestershire, in 1741, which was two feet six inches long, and four inches in girth. The fore-legs were placed eight inches from the head; the hind-legs five inches beyond those: the legs two inches long: the feet divided into four toes, each furnished with a sharp claw. Another was killed at Penbury, in the same county. Whether these are not of exotic descent, and whether the breed continues, is what we are at present uninformed of.
THE length of this species was six inches and an half, of which the tail was three and a quarter.

The irides yellow: the head and beginning of the back flat, and covered with small pimples or warts, of a dark dusky color; the sides with white ones: the belly, and the side of the tail, was of a bright yellow; the first spotted with black.

The tail was compressed sideways, and very thin towards the upper edge, and slender towards the end.

The fore-feet divided into four toes; the hind into five; all without nails, dusky spotted with yellow.

Its pace is flow and crawling.

This species we have frequently seen in the state we describe, but are uncertain whether we ever met with it under the form of a larve. We have more than once found under stones and old logs, some very minute young lizards that had much the appearance of this kind: they were perfectly
perfectly formed, and had not the least vestiges of fins; so that circumstance, joined to their being found in a dry place, remote from water, makes us imagine them to have never been inhabitants of that element, as it is certain many of our lizards are in their first state.

At that period they have a fin above and below their tail; that on the upper part extends along the back as far as the head, but both drop off as soon as the animal takes to the land, being then no longer of any use.

Besides these circumstances that attend them in form of a larve, Mr. Ellis * has remarked certain pennated fins at the gills of one very common in most of our stagnating waters, and which is frequently observed to take a bait like a fish.


THIS is three inches long: the body slender; the tail long, slightly compressed, small and taper; that and the upper part of the body of a pale brown, marked on each side the back with a

Class III. **ANGUINE LIZARD.**
narrow black line reaching to the end of the tail; the belly of a pale yellow, marked with small dusky spots; the toes formed like those of the preceding.


**T**his species is mentioned by Mr. Ray in his list of the *English* lizards, without any other description than is comprehended in the *synonym*.

Lacertus terrestris anguiformis in ericetis. *Raii syn. quad.* 264. **ii. ANGUINE.**

We remain also in the same obscurity in respect to this species. It seems to be of that kind which connects the serpent and lizard genus, having a long and very slender body, and very small legs. Such are the *Seps*, or *Lacerta Chalcidica* of *Raii syn. quad.* 272, the *Lacerta anguina* of *Linnaeus*, 371, or that figured by *Seba*, *tom.* ii. *tab.* 68. under the name of *Vermis serpentiformis.*

Long
VIPER.  
CLASS III.

IV. SERPENT.  
Long and slender bodies, covered with scaly plates:  
No feet.

12. VIPER.  
Plinii, lib. x. c. 42.  
Vipera. Gesner Serp. 71.  
Viper, or Adder. Rayi fyn.  

VIPERS are found in many parts of this island,  
but the dry, stony, and, in particular, the  
chalky countries abound with them. They swarm  
in many of the Hebrides.

They are viviparous, not but that they are hatch-  
ed from an internal egg; being of that class of  
animals, of whose generation Aristotle * says,  
Ἐν αὐτοῖς μὲν ὄστοκει τὸ τέλειον ὄوى, ἔξω ὃς ὄστοκει, ἰ. ἰ. They  
conceive a perfect egg within, but bring forth their  
young alive.

Providence is extremely kind in making this spe-  
cies far from being prolific, we having never heard  
of more than eleven eggs being found in one viper,  
and those are as if chained together, and each about  
the size of a blackbird’s egg.

* De Gen. an. Lib. III. c. 2.  

26
The viper grows seldom to a greater length than two feet; though once we saw a female (which is nearly a third larger than the male) which was almost three feet long.

The ground-color of this serpent is a dirty yellow; that of the female deeper. Its back is marked the whole length with a series of rhomboid black spots, touching each other at the points; the sides with triangular ones; the belly entirely black.

There is a variety wholly black; but the rhomboid marks are very conspicuous even in this, being of a deeper and more glossy hue than the rest. Petiver calls it the Vipera Anglica Nigricans. Pet. Mus. No. 204.*

The head of the viper is inflated, which distinguishes it from the common snake. The tongue forked; the teeth small; the four canine teeth are placed two on each side the upper jaw: these instruments of poison are long, crooked, and moveable, and can be raised and depressed at pleasure; they are hollow from near the point to their base, near which is a gland that secretes, prepares, and lodges the poison; and the same action that gives the wounds, forces from this gland, through the tooth, the fatal juice into it.

These glands may be particularly thankful for the blessing they enjoy, in being possessed of only

one venomous animal, and that of a kind which encreases so little.

They copulate in May, and are supposed to be about three months before they bring forth.

They are said not to arrive at their full growth in less than six or seven years; but that they are capable of engendering at two or three.

We have been often assured by intelligent people of the truth of a fact mentioned by Sir Thomas Brown*, who was far from a credulous writer, that the young of the viper, when terrified, will run down the throat of the parent, and seek shelter in its belly in the same manner as the young of the oppossum retire into the ventral pouch of the old one.

From this some have imagined that the viper is so unnatural as to devour its own young; we disbelieve the fact, it being well known that the food of these serpents is frogs, toads, lizards, mice, and, according to Doctor Mead, even an animal so large as a mole. These they swallow entire; which, if we consider the narrowness of their neck, shews it is capable of a distension hardly credible, had we not ocular proofs of the fact.

It is also said, from good authority, that they will prey on young birds; whether on such as nestle on the ground, or whether they climb up trees for them as the Indian serpents do, we are quite un-
Class III. V I P E R.
certain; but we are well assured that this discovery is far from a recent one:

Ut affidens implumibus pullis avis
    Serpentium allopsus timet *.

Thus, for its young the anxious bird
The gliding serpent fears.

The viper is capable of supporting very long abstinence, it being known that some have been kept in a box six months without food, yet did not abate of their vivacity. They feed only a small part of the year, but never during their confinement; for if mice, their favorite diet, should at that time be thrown into their box, tho' they will kill, yet they never will eat them.

The poison decreases in violence in proportion to the length of their confinement: it must be also added, the virtues of its flesh (whatsoever they be) are at the same time considerably lessened.

These animals, when at liberty, remain torpid throughout the winter; yet when confined have never been observed to take their annual repose.

The method of catching them is by putting a cleft stick on or near their head; after which they are seized by the tail, and put instantly into a bag.

The viper-catchers are very frequently bit by them in the pursuit of their business, yet we very

* Hor. Epod. I.

rarely
VIPER. Class III.
rarely hear of the bite being fatal. The remedy, if applied in time, is very certain, and is nothing else but fallad oil, which the viper-catchers seldom go without. The axungia viperina, or the fat of vipers, is also another. Doctor Mead suspects the efficacy of this last, and substitutes one of his own in its place*; but we had rather trust to vulgar receipts which perpetual trials have shewn to be infallible.

The symptoms of the venom, if the wound is neglected, are very terrible: it first causes an acute pain in the place affected, attended with a swelling, first red, afterwards livid, which by degrees spreads to the neighboring parts; great faintness, and a quick tho' low and interrupted pulse ensue; great sickness at the stomach, bilious convulsive vomitings, cold sweats, and sometimes pains about the navel; and in consequence of these, death itself. But the violence of the symptoms depends much on the season of the year, the difference of the climate, the size or rage of the animal, or the depth or situation of the wound.

Dreadful as the effects of its bite may be, yet its flesh has been long celebrated as a noble medicine. Doctor Mead cites from Pliny, Galen, and other antients, several proofs of its efficacy in the cure of ulcers, the elephantiasis, and other bad complaints. He even says he has seen good effects

* Essay on Poisons, 47.
from it in an obstinate lepra: it is at present used as a restorative, tho' we think the modern physicians have no great dependence on its virtues. The antients prescribed it boiled, and to be eaten as fish; for when fresh, the medicine was much more likely to take effect than when dried, and given in form of a powder or troche. Mr. Keysler relates that Sir Kenelm Digby used to feed his wife, who was a most beautiful woman, with capons fattened with the flesh of vipers.

The antient Britons had a strange superstitition in respect to these animals, and of which there still remains in Wales a strong tradition. The account Pliny gives of it is as follows: we shall not attempt a translation, it being already done to our hands in a spirited manner by the ingenious Mr. Mason, which we shall take the liberty of borrowing.

Præterea est ovorum genus in magna Galliarum fama, omisso Græcis. Angues innumeris estate convoluti, salivis faucium corporumque spumis artifici complexi glomerantur; anguinum appellatur. Druidæ sibilis id dicunt in sublime jaellari, sagoque opor-
tere intercipi, ne tellurem attingat: profugere rapto-
rem equo: serpentes enim insequi, donec arceantur am-
nis alicujus interventu*.

* Lib. XXIX. c. 3.

But
But tell me yet
From the grot of charms and spells,
Where our matron sister dwells,
Brennus, has thy holy hand
Safely brought the Druid wand,
And the potent Adder-stone,
Gender’d ’fore the autumnal moon?
When in undulating twine,
The foaming snakes prolific join;
When they hiss, and when they bear
Their wond’rous egg aloof in air;
Thence before to earth it fall,
The Druid in his hallow’d pall,
Receives the prize,
And instant flies,
Follow’d by the envenom’d brood,
’Till he cross the crystal flood *.

This wondrous egg seems to be nothing more than a bead of glass, used by the Druids as a charm to impose on the vulgar, whom they taught to believe, that the possessor would be fortunate in all his attempts, and that it would gain him the favor of the great.

Our modern Druidesses give much the same account of the ovum anguinum, Glain Neidr, as the Welch call it, or the Adder-Gem, as the Roman philosopher does, but seem not to have so exalted an opinion of its powers, using it only to assist children in cutting their teeth, or to cure the chin-cough, or to drive away an ague.

* Mason’s Caradactus. The person speaking is a Druid.
Class III. S N A K E.

We have some of these beads in our cabinet: they are made of glass, and of a very rich blue color; some are plain, others streaked: we say nothing of the figure, as the annexed plate will convey a stronger idea of it than words.

THE snake is the largest of the English serpents, sometimes exceeding four feet in length: the neck is slender; the middle of the body
body thickest; the back and sides covered with small scales, the belly with oblong, narrow, transverse plates. The first Linnaeus distinguishes by the name of *squama*, the last he calls *scuta*, and from them forms his genera of serpents.

Those that have both *squama* and *scuta* he calls *Colubri*; those that have only *squama*, *Angues*. The viper and snake are comprehended in the first genus, the blind-worm under the second; but we chuse (to avoid multiplying our genera) to take in the few serpents we have by a single genus, their marks being too evident to be confounded.

The color of the back and sides of the snake are dusky or brown; the middle of the back marked with two rows of small black spots running from head to tail; and from them are multitudes of lines of spots crossing the sides; the plates on the belly are dusky, the scales on the sides of a bluish white.

On each side the neck is a spot of pale yellow, and the base of each is a triangular black spot, one angle of which points towards the tail.

The teeth are small and serrated, lying each side the jaw in two rows.

This species is perfectly inoffensive; it frequents and lodges itself among bushes in moist places, and will readily take the water, swimming very well.

It preys on frogs, insects, worms, and mice, and, considering the smallness of the neck, it is amazing how large an animal it will swallow.

The
Class III. Blind-worm.

The snake is oviparous: it lays its eggs in dung-hills, and in hot-beds, whose heat, aided by that of the sun, promotes the exclusion of the young.

During winter it lies torpid in banks of hedges, and under old trees.

Anguis Eryx. Lin. fift. 392.

LENGTH fifteen inches. Tongue broad and forked. Nostrils small, round, and placed near the tip of the nose. Eyes lodged in oblong fissures above the angle of the mouth. Belly of a bluish lead color, marked with small white spots irregularly disposed. The rest of the body of a greyish brown, with three longitudinal dusky lines, one extending from the head along the back to the point of the tail; the others broader, and extending the whole length of the sides. It had no scuta; but was entirely covered with small scales; largest on the upper part of the head.

Inhabits Aberdeenshire. Communicated to me by the late Doctor David Skene.
15. **Blind-worm.**


Long Cripple. *Borlæse Cornw. 284. tab. 28.*


---

**Descrip.**

The usual length of this species is eleven inches: the irides are red; the head small; the neck still more slender; from that part the body grows suddenly, and continues of an equal bulk to the tail, which ends quite blunt.

The color of the back is cinereous, marked with very small lines composed of minute black specks; the sides are of a reddish cast; the belly dusky, both marked like the back.

The tongue is broad and forked; the teeth minute, but numerous; the scales small.

The motion of this serpent is slow, from which, and from the smallness of the eyes, are derived its names. Like others of the genus, they lie torpid during winter, and are sometimes found in vast numbers twisted together.

Like the former it is quite innocent. *Doctor Borlæse* mentions a variety of this serpent with a pointed tail; and adds, that he was informed that a man lost his life by the bite of one in *Oxfordshire.*

We
We are inclined to think that his informant mistook the black or dusky viper for this kind; for, excepting the viper, we never could learn that there was any sort of poisonous serpent in these kingdoms.

In Sweden is a small reddish serpent, called there *Asping*, the *Coluber Chersea* of *Linnaeus*, whose bite is said to be mortal. Is it possible that this could be the species which has hitherto escaped the notice of our naturalists? I the rather suspect it, as I have been informed, that there is a small snake that lurks in the low grounds of Galloway, which bites and often proves fatal to the inhabitants.
CLASS IV.

FISH.

Oh Deus! ampla tua, quam sunt miracula dextra!
O quam solerti singula mente regis!
Divite tu gazá terras, et messibus imples;
Nec minus est vasti fertilis unda maris:
Squammiger bunc peragrat populus, prolesque parentum
Stipat, et ingentes turba minuta duces.

Jonston. Psalmus civ.
F I S H.

Div. I. CETACEOUS FISH.

No gills; an orifice on the top of the head, thro’ which they breathe, and eject water; a flat or horizontal tail; exemplified in the explanatory plate, fig. 1. by the Beaked Whale, borrowed from Dale’s Hist. Harw. 411. Tab. 14.

GENERA.

I. WHALE.
II. CACHALOT.
III. DOLPHIN.

Div. II. CARTILAGINOUS FISH.

Breathing thro’ certain apertures, generally placed on each side the neck, but in some instances beneath, in some above, and from one to seven in number on each part, except in the Pipe Fish, which has only one.

The muscles supported by cartilages, instead of bones.

Explan. Pl. fig. 2. the Picked Dog Fish.

a. The lateral apertures.

IV. LAM-
FISH.

IV. LAMPREY.
V. SKATE.
VI. SHARK.
VII. FISHING FROG.
VIII. STURGEON.
IX. SUN FISH.
X. LUMP FISH.
XI. PIPE FISH.

DIV. III. BONY FISH.

This division includes those whose muscles are supported by bones or spines, which breathe thro' gills covered or guarded by thin bony plates, open on the side, and dilatable by means of a certain row of bones on their lower part each separated by a thin web, which bones are called the *Radii Branchioptegi*, or the Gillcovering Rays.

The tails of all the fish that form this division, are placed in a situation perpendicular to the body, and this is an invariable character.

The later Ichthyologists have attempted to make the number of the branchioptegous rays a character of the genera; but I found (yet too late in some instances, where I yielded an implicit faith) that their rule was very fallible, and had induced me into error; but as I borrowed other definitions, it is to be hoped the explanation of the genera will be intelligible. I should be very disingenu-
ous, if I did not own my obligations in this respect to the works of Artedi, Dr. Gronovius, and Linnaeus.

It is from the last I have copied the great sections of the Bony Fish into

**Apodal, Jugular, Thoracic, Abdominal.**

He founds this system on a comparison of the ventral fins to the feet of land animals or reptiles; and either from the want of them, or their particular situation in respect to the other fins, establishes his sections.

In order to render them perfectly intelligible, it is necessary to refer to those several organs of movement, and some other parts, in a perfect fish, or one taken out of the three last sections.

The Haddock. Expl. Pl. fig. 4.

- **a.** The pectoral fins.
- **b.** ventral fins.
- **c.** anal fins.
- **d.** caudal fin, or the tail.
- **e. e. e.** dorsal fins.
- **f.** bony plates that cover the gills.
- **g.** branchioptegous rays, and their membranes.
- **h.** lateral, or side line.

* Vide Syt. Nat. 422.*
Sect. I. Apodal.

The most imperfect, wanting the ventral fins; illustrated by the Conger, fig. 3. This also expresses the union of the dorsal and anal fins with the tail, as is found in some few fish.

XII. Eel.
XIII. Wolf Fish.
XIV. Launce.
XV. Morris.
XVI. Sword Fish.

Sect. II. Jugular.

The ventral fins \( b \), placed before the pectoral fins \( a \), as in the Hadock, fig. 4.

XVII. Dragonet.
XVIII. Weever.
XIX. Codfish.
XX. Blenny.
Sect. III. Thoracic.

The ventral fins $a$, placed beneath the pectoral fins $b$, as in the Father Lasher, fig. 5.

XXI. Goby.
XXII. Bull-head.
XXIII. Doree.
XXIV. Flounder.
XXV. Gilt-head.
XXVI. Wrasse.
XXVII. Perch.
XXVIII. Stickleback.
XXIX. Mackrel.
XXX. Surmullet.
XXXI. Gurnard.

The ventral fins placed behind the pectoral fins, as in the Minow, fig. 6.

XXXII. Loché.
XXXIII. Salmon.
XXXIV. Pike.
XXXV. Argentine.
XXXVI. Atherine.
XXXVII. Mullet.
XXXVIII. Flying Fish.
XXXIX. Herring.
XL. Carp.
Div. I. CETACEOUS FISH.

Nature on this tribe hath bestowed an internal structure in all respects agreeing with that of quadrupeds; and in a few other the external parts in both are similar.

Cetaceous Fish, like land animals, breathe by means of lungs, being destitute of gills. This obliges them to rise frequently to the surface of the water to respire, to sleep on the surface, as well as to perform several other functions.

They have the power of uttering sounds, such as bellowing and making other noises, a faculty denied to genuine fish *.

Like land animals they have warm blood, are furnished with organs of generation, copulate, bring forth, and suckle their young, shewing a strong attachment to them.

Their bodies beneath the skin are entirely surrounded with a thick layer of fat (blubber) analogous to the lard on hogs.

The number of their fins never exceeds three,


viz.
CETACEOUS FISH. Class IV.

viz. two pectoral fins, and one back fin; but in some species the last is wanting.

Their tails are placed horizontally or flat in respect to their bodies; contrary to the direction of those of all other fish, which have them in a perpendicular site. This situation of the tail enables them to force themselves suddenly to the surface of the water to breathe, which they are so frequently constrained to do.

Many of these circumstances induced Linnaeus to place this tribe among his Mammalia, or what other writers style quadrupeds.

To have preserved the chain of beings entire, he should in this case have made the genus of Phoca, or Seals, and that of the Trichecus or Manati, immediately precede the whale, those being the links that connect the Mammalia or quadrupeds with the fish; for the Seal is, in respect to its legs, the most imperfect of the former class; and in the Manati the hind feet coalesce, assuming the form of a broad horizontal tail.

Notwithstanding the many parts and properties which cetaceous fish have in common with land animals, yet there still remain others, that in a natural arrangement of the animal kingdom, must determine us after the example of the illustrious Ray*, to place them in the rank of fish; and for

* Who makes two divisions of fish.

1. Pulmone respirantes.
2. Branchiis respirantes.
the same reasons, that first of systematic writers assigns,

That the form of their bodies agrees with that of fish.

They are entirely naked, or covered only with a smooth skin.

They live entirely in the water, and have all the actions of fish.
COMMON WHALE. CLASS IV.

I. WHALE. Cetaceous Fish without teeth, with horny laminae in their mouths.

Musculus Plinii, Lib. XI. c. 37.
Balæna major, laminas cornes in superiore maxillar habens, fistula donata, bikipinnis. Sib. Phalen. 28.
Balæna vulgaris edentula, dorso non pinnato. Rari syn. pisç. 6.
Balæna. Rondel. Wil. Lib. 35.

La Baleine ordinaire. Brisson Cet. 218.
Balæna fistula in medio capite, dorso caudum verfus, acuminato. Artem. syn. 106.
Sp. 106.
Balæna mysticetus. Lin. 535.

Size.

THIS species is the largest of all animals: it is even at present sometimes found in the northern seas ninety feet in length; but formerly they were taken of a much greater size, when the captures were less frequent, and the fish had time to grow. Such is their bulk within the arctic circle, but in those of the torrid zone, where they are unmolested, whales are still seen one hundred and sixty feet long*.

* Adanforf's voy. 174. From this account we find no reason to disbelieve the vast size of the Indian whales, of whose bones...
The head is very much disproportioned to the size of the body, being one-third the size of the fish: the under lip is much broader than the upper. The tongue is composed of a soft spongy fat, capable of yielding five or six barrels of oil. The gullet is very small for so vast a fish, not exceeding four inches in width. In the middle of the head are two orifices, thro' which it spouts water to a vast height, and with a great noise, especially when disturbed or wounded.

The eyes are no larger than those of an ox.

On the back there is no fin, but on the sides, beneath each eye, are two large ones.

The penis is eight feet in length, inclosed in a strong sheath. The teats in the female are placed in the lower part of the belly.

The tail is broad and semilunar.

This whale varies in color: the back of some being red, the belly generally white. Others are black, some mottled, others quite white, according to the observation of Marten, who says, that their colors in the water are extremely beautiful, and that their skin is very smooth and slippery.

What is called whalebone adheres to the upper jaw, and is formed of thin parallel laminae, some bones and jaws, both Strabo, Lib. XV. and Pliny, Lib. IX. c. 3. relate, that the natives made their houses, using the jaws for door-cases. This method of building was formerly practised by the inhabitants of Greenland, as we find from Frobisher, in his second voyage, p. 18, published in 1587.
of the longest four yards in length; of these there are commonly 350 on each side, but in very old fish more; of these about 500 are of a length fit for use, the others being too short. They are surrounded with long strong hair, not only that they may not hurt the tongue, but as strainers to prevent the return of their food when they discharge the water out of their mouths.

It is from these hairs that Aristotle gave the name of Musculus, or the bearded whale, to this species, which he tells us had in its mouth hairs instead of teeth*; and Pliny describes the same under the name of Musculus †. Though the antients were acquainted with this animal, yet as far as we recollect, they were ignorant of their uses as well as capture.

Aldrovand‡ indeed describes from Oppian, what he mistakes for whale fishing: he was deceived by the word μυρίκτος, which is used not only to express whale in general, but any great fish. The poet here meant the sbark, and shews the way of taking it in the very manner practiced at present, by a strong hook baited with flesh. He describes too its three-fold row of teeth, a circumstance that at once disproves its being a whale:

† Lib. XI. c. 37.
‡ De Cetis. 261.
Who's dreadful teeth in triple order stand,
Like spears out of his mouth.

The whale, though so bulky an animal, swims
with vast swiftness, and generally against the wind.
It brings only two young at a time, as we believe is the case with all other whales.
Its food is a certain sort of small snail, and as Linnaeus says, the medusa, or sea blubber.
The great resort of this species is within the arctic circle, but they sometimes visit our coasts.
Whether this was the British whale of the antients we cannot pretend to say, only we find, from a line in Juvenal, that it was of a very large size;

Quanto Delphinis Balena Britannica major.

Sat. X.

As much as British whales in size surpass
The dolphin race.

To view these animals in a commercial light, we must add, that the English were late before they engaged in the whale-fishery: it appears by a set of queries, proposed by an honest merchant in the year 1575, in order to get information in the business, that we were at that time totally ignorant
rant of it, being obliged to send to Biskeia for men skilful in the catching of the whale, and ordering of the oil, and one cooper skilful to set up the staved cask*. This seems very strange; for by the account Oðber gave of his travels to King Alfred, near 700 years† before that period, it is evident that he made that monarch acquainted with the Norwegians practising the whale-fishery; but it seems all memory of that gainful employ, as well as of that able voyager Oðber, and all his important discoveries in the North were lost for near seven centuries.

It was carried on by the Biscayeners long before we attempted the trade, and that for the sake not only of the oil, but also of the whalebone, which they seem to have long trafficked in. The earliest notice we find of that article in our trade is by Hackluyt ‡, who says it was brought from the Bay of St. Laurence by an English ship that went there for the barbes and fynnes of whales and train oil, A.D. 1594, and who found there seven or eight hundred whale fynnes, part of the cargo of two great Biskeaine ships, that had been wrecked there three years before. Previous to that, the ladies' stays must have been made of split cane, or some tough wood, as Mr. Anderson observes in his

* Hackluyt's Col. voy. I. 414.
† Idem, I. 4.
‡ Idem, III. 194.
Dictionary of Commerce*, it being certain that
the whale fishery was carried on, for the sake of
the oil, long before the discovery of the use of whale
bone.

The great resort of these animals was found to
be on the inhospitable shores of Spitzbergen, and
the European ships made that place their principal
fishery, and for numbers of years were very suc-
cessful: the English commenced that business about
the year 1598, and the town of Hull had the honor
of first attempting that profitable branch of trade.
At present it seems to be on the decline, the quan-
tity of fish being greatly reduced by the constant
capture for such a vast length of time: some re-
cent accounts inform us, that the fishers, from a
defect of whales, apply themselves to seal fishery,
from which animals they extract an oil. This
we fear will not be of any long continuance; for
these shy and timid creatures will soon be induced
to quit those shores by being perpetually harrassed,
as the morse or walrus has already in a great
measure done. We are also told, that the poor
natives of Greenland begin even now to suffer from
the decrease of the seal in their seas, it being their
principal subsistence; so that should it totally de-
desert the coast, the whole nation would be in dan-
ger of perishing through want.

In old times the whale seems never to have been

* Vol. I. 442,

Royal Fish.
taken on our coasts, but when it was accidentally flung ashore: it was then deemed a royal fish*, and the king and queen divided the spoil; the king asserting his right to the head, her majesty to the tail †.


SIZE. THE length of that taken on the coast of Scotland, as remarked by Sir Robert Sibbald, was forty-six feet, and its greatest circumference twenty.

DESCRIP. The head of an oblong form, sloping down, and growing narrower to the nose; six feet eight inches from the end of which were two spout-holes, separated by a thin division: the eyes small. The pectoral fins five feet long, and one and a half broad: on the back, about eight feet and an half from the tail, in lieu of a back fin, was a hard horny protuberance: the tail was nine feet and a half broad.

* Item habet warectum maris per totum regnum Ballenas et Sturiones captos, &c. Edwardi II. anno 17mo.
† Blackstone's Com. I. c. 4.
The belly was uneven, and formed into folds running length-ways.

The skin extremely smooth and bright; that on the back black; that on the belly white.

This species takes its name from the shape of its nose, which is narrower and sharper pointed than that of other whales.


Fin Fish. \textit{Martens Spitzberg}, 165.

\textit{Egede Greenl.} 65. \textit{Crantz Greenl. I. 110.}

\textit{Le Gibbar. Brisson Cet. 222. 18. Fin fish.}

Balæna fistula in medio capite tubero penniformi in extremo dorso. \textit{Arted. syn. 107.}

Balæna Phyfalus. \textit{Lin. fisf. 106.}

\textbf{T HIS species is distinguished from the common whale by a fin on the back, placed very low and near the tail.}

The length is equal to that of the common kind, but much more slender. It is furnished with whale-bone in the upper jaw, mixed with hairs, but short and knotty, and of little value. The blubber also on the body of this kind is very inconsiderable; these circumstances, added to its extreme fierceness and agility, which renders the capture very dangerous, cause the fishers to neglect it. The natives of Greenland though hold it in great esteem, as it affords a quantity of flesh, which to their palate is very agreeable,
ROUND-LIPPED WHALE. Class IV.

The lips are brown, and like a twisted rope: the spout hole is as it were split in the top of its head, through which it blows water with much more violence, and to a greater height, than the common whale. The fishers are not very fond of seeing it, for on its appearance the others retire out of those seas.

Some writers conjecture this species to have been the Ἐκανος, and Physeter, or blowing whale of Oppian, Åelian, and Pliny*; but since those writers have not left the left description of it, it is impossible to judge which kind they meant; for in respect to the faculty of spouting out water, or blowing, it is not peculiar to any one species, but common to all the whale kind.


THE character of this species is to have the lower lip broader than the upper, and of a semicircular form.

That taken in 1692 near Abercorn-Castle, was seventy-eight feet long, the circumference thirty-

* Oppian, Halicut, I. Lin. 368. Ålian Hist. an. ix. c. 49. Plin. lib. ix. c. 5.
Class IV. Beaked Whale.

five; the *riëns* or gape very wide; the tongue fifteen feet and a half long; the mouth furnished with short whale-bone, about three feet in length. On the forehead were two spout holes of a pyramidal form.

The eyes were placed thirteen feet from the end of the nose: the pectoral fins ten feet long; the back fin about three feet high, placed near the tail, which was eighteen feet broad: the belly was full of folds.

This species is said to feed on herrings.


Bottle-head, or Flounders-head. Dale Harwich, 411.


This species was taken near Maldon, 1717, and thus described by Dale and Marten.

The length was fourteen feet, the circumference seven and an half; the body very thick, the forehead high, the nose depressed, and of the same thickness its whole length, not unlike the beak of a bird: in the mouth were no teeth.

The eyes large, the eyelids small, and placed a little above the line of the mouth. The spout hole was on the top of the head semicircular, with the corners pointed towards the tail.

The pectoral fins were seventeen inches long.
BEAKED WHALE. Class IV.

The back fin was placed rather nearer the tail than the head, and was a foot long: the breadth of the tail was three feet two inches.

These fish sometimes grow to the length of twenty feet; they make but little noise in blowing, are very tame, come very near the ships, and will accompany them for a great way.

_Belon_ describes and figures a fish very much resembling, if not the same with this: he says it furnished whale-bone, _Dont les Dames font aujordhuy leurs bustes et arrondissent leurs verdugades*_, by which it appears, that the commodity was but newly known at that time in France. He adds, that the tongue was very good eating, and both that and the flesh used to be salted for provision.

* _Belon de la nat. &c. des Poissons, 1555_, p. 6, by which it appears that the French were acquainted with that article at least forty years before we were.
Cetaceous Fish, with teeth in the lower jaws only. II. CACHALOT.

Trumpa. Purchas's Pilgrimes III. 471.
Le cachalot a dents en faucil-

A FISH of this kind was cast ashore on Cramond Isle, near Edinburgh, December 22d, 1769; its length was fifty-four feet, the greatest circumference, which was just beyond the eyes, thirty: the upper jaw was five feet longer than the lower, whose length was ten feet.

The head was of a most enormous size, very thick, and above one-third the size of the fish: the end of the upper jaw was quite blunt, and near nine feet high: the spout hole was placed near the end of it.

The teeth were placed in the lower jaw, twenty-three on each side, all pointing outwards; in the upper jaw, opposite to them, were an equal number of cavities, in which the ends of the teeth lodged when the mouth was closed. The tooth, figured
BLUNT-HEADED CACHALOT. Class IV.

figured in plate iii. No. 2. was eight inches long, the greatest circumference the same. It is hollow within side for the depth of three inches, and the mouth of the cavity very wide: it is thickest at the bottom, and grows very small at the point, bending very much; but in some the flexure is more than in others. These, as well as the teeth of all other whales we have observed, are very hard, and cut like ivory.

The eyes very small, and remote from the nose.

The pectoral fins placed near the corners of the mouth, and were only three feet long: it had no other fin, only a large protuberance on the middle of the back.

The tail a little forked, and fourteen feet from tip to tip.

The penis seven feet and a half long.

The figure, plate ii. we borrowed from a print in the L.X. vol. of the Pb. Tr. p. where there is a very good account of this species by Mr. James Robertson, surgeon.

This is one of the species which yield what is improperly called spermaceti; that substance being found lodged in the head of the fish that form this genus, which the French call Cachalot, a name we have adopted, having no general term for it in our tongue.

Linneus informs us, that this species pursues and terrifies the Porpesses to such a degree as often to drive them on shore.

Belæna
TEETH OF CETACEOUS FISH.

No. 23.

No. 21.

No. 24.

No. 22.
This species was taken on one of the Orkney Isles, a hundred and two of different sizes being cast ashore at one time, the largest twenty-four feet in length.

The head was round, the opening of the mouth small: Sibbald says it had no spout hole, but only nostrils. We rather think, that the former being placed at the extremity of the nose was mistaken by him for the latter.

The teeth we have in our cabinet of this species (plate iii. No. 4.) are an inch and three-quarters long, and in the largest part, of the thickness of one's thumb. The top is quite flat, and marked with concentric lines; the bottom is more slender than the top, and pierced with a small orifice.

The back fin was wanting; instead was a rough space.
23. High-fin\-ned.


Raii syn. pisc. 16.


ONE of this species was cast on the Orkney Isles in 1687. The spout hole was placed in front, and on the middle of the back was a high fin, which Sibbald compares to the mizen mast of a ship. The head abounded with sperma ceti of the best sort.

Teeth.

The teeth of this kind are very slightly bent; that which we have figured, plate iii. No. 1. is seven inches three-quarters in length; the greatest circumference nine: it is much compressed on the sides; the point rather blunt than flat; the bottom thin, having a very narrow but long orifice, or slit, hollowed to the depth of five inches and a quarter, and the tooth was immersed in the jaw as far as that hollow.
HISTORIANS and philosophers seem to have contended who should invent most fables concerning this fish. It was consecrated to the Gods, was celebrated in the earliest time for its fondness of the human race, was honored with the title of the Sacred Fish*, and distinguished by those of Boy-loving, and Philanthropist. It gave rise to a long train of inventions, proofs of the credulity and ignorance of the times.

Aristotle fleers the clearest of all the antients from these fables, and gives in general so faithful a natural history of this animal, as evinces the superior judgment of that great philosopher, in comparison to those who succeeded him. But the elder

* Athenæus, 281.

Vol. III.
DOLPHIN. Class IV.

Pliny, Ælian, and others, seem to preserve no bounds in their belief of the tales related of this fish's attachment to mankind.

Pliny*, the younger, (apologizing for what he is going to say) tells the story of the enamoured dolphin of Hippo in a most beautiful manner. It is too long to be transcribed, and would be injured by an abridgement; therefore we refer the reader to the original, or to Mr. Melmoth's elegant translation.

Scarce an accident could happen at sea but the dolphin offered himself to convey to shore the unfortunate. Arion, the musician, when flung into the ocean by the pyrates, is received and saved by this benevolent fish.

Inde (fide majus) tergo Delphina recurvo,
Se memorant oneri supposuisse novo.
Ille sedens citharamque tenens, pretiumque vehendi
Cantat, et æquoreas carmine mulcet aquas.

Ovid. Fasti, lib. ii. 113.

But (past belief) a Dolphin's arched back,
Preserved Arion from his destined wrack;
Secure he suits, and with harmonious strains,
Requites his bearer for his friendly pains.

We are at a loss to account for the origin of those fables, since it does not appear that the dolphin shews a greater attachment to mankind than

* Epist. lib. ix. ep. 33.
the rest of the cetaceous tribe. We know that at present the appearance of this fish, and the porpoise, are far from being esteemed favorable omens by the seamen; for their boundings, springs and frolics in the water, are held to be sure signs of an approaching gale.

It is from their leaps out of that element that they assume a temporary form that is not natural to them, but which the old painters and sculptors have almost always given them. A dolphin is scarce ever exhibited by the antients in a strait shape, but almost always incurvated: such are those on the coin of Alexander the Great, which is preserved by Belon, as well as on several other pieces of antiquity. The poets describe them much in the same manner, and it is not improbable but that the one had borrowed from the other:

Tumidumque pando translit dorso mare
Tyrrhenus omni piscis exsultat freto,
Agitatque gyros.


Upon the swelling waves the dolphins shew
Their bending backs, then swiftly darting go,
And in a thousand wreaths their bodies throw.

The natural shape of the dolphin is almost strait, the back being very slightly incurvated, and the body slender: the nose is long, narrow, and point-
ed, not much unlike the beak of some birds, for which reason the French call it *L'* oye de mer.

It has in all forty-two teeth, twenty-one in the upper jaw, and nineteen in the lower, a little above an inch long, conic at their upper end, sharp pointed*, bending a little in. They are placed at small distances from each other, so that when the mouth is shut, the teeth of both jaws lock into one another: a single one is figured plate iii. No. 5.

The spout hole is placed in the middle of the head.

The back fin is high, triangular, and placed rather nearer to the tail than to the head; the pectoral fins situated low.

The tail is semilunar.

The skin is smooth, the color of the back and sides dusky; the belly whitish.

It swims with great swiftness: its prey is fish.

It was formerly reckoned a great delicacy: Doctor Caius says, that one which was taken in his time, was thought a present worthy the Duke of Norfolk, who distributed part of it among his friends. It was roasted and dressed with porpessé sauce, made of crumbs of fine white bread, mixed with vinegar and sugar.

This species of dolphin must not be confounded with that to which seamen give the name, the

* Plate iii. fig. 5. 

latter
latter being quite another kind of fish, the Cory-
phaena, Hippuris of Linnaeus, p. 446. and the Do-
rado of the Portuguese, described by Willughby, p.
213.

These fish are found in vast multitudes in
all parts of the sea that wash these islands,
but in greatest numbers at the time when fish of
passage appear, such as mackerel, herrings, and
salmon, which they pursue up the bays with the
same eagerness as a pack of dogs does a hare. In
some places they almost darken the sea as they
rise above water to take breath: but porpeses not
only seek for prey near the surface, but often
defend to the bottom in search of sand eels, and
sea worms, which they root out of the sand with
their noses in the same manner as hogs do in the
fields for their food.

Their bodies are very thick towards the head,
PORPESSE. CLASS IV.

but grows slender towards the tail, forming the figure of a cone.

The nose projects a little, is much shorter than that of the dolphin, and is furnished with very strong muscles, which enables it the readier to turn up the sand.

In each jaw are forty-eight teeth, small, sharp pointed, and a little moveable: like those of the dolphin, they are so placed as that the teeth of one jaw locks into those of the other when closed.

The tongue is flat, pectinated at the edges, and fastened down to the bottom of the mouth.

The eyes small; the spout hole on the top of the head.

On the back is one fin placed rather below the middle; on the breast are two fins. The tail semilunar.

The color of the porpess is generally black, and the belly whitish, not but they sometimes vary; for in the river St. Laurence there is a white kind; and Doctor Borlase, in his voyage to the Scilly Isles, observed a small species of cetaceous fish, which he calls thornbacks, from their broad and sharp fin on the back, some of these were brown, some quite white, others spotted: but whether they were only a variety of this fish, or whether they were small grampuses, which are also spotted, we cannot determine.

The porpess is remarkable for the vast quantity of the fat or lard that surrounds the body, which
Class IV. PORPESSE.

which yields a great quantity of excellent oil: from this lard, or from their rooting like swine, they are called in many places sea hogs; the Germans call them meerschwein; the Swedes, maruin; and the English, porpessé, from the Italian, porco pesce.

It would be curious to trace the revolutions of fashion in the article of eatables; what epicure first rejected the Sea-Gull and Heron; and what delicate stomach first nauseated the greasy flesh of the Porpessé. This latter was once a royal dish, even to late as the reign of Henry VIII. and from its magnitude must have held a very respectable station at the table; for in a household book of that prince, extracts of which are published in the third volume of the Archaeologia, it is ordered that if a Porpessé should be too big for a horse-load, allowance should be made to the purveyor. I find that this fish continued in vogue even in the reign of Elizabeth, for Doctor Caius* on mentioning a Dolphin (that was taken at Shoreham, and brought to Thomas Duke of Norfolk, who divided, and sent it as a present to his friends) says, that it eat best with Porpessé sauce, which was made of vinegar, crumbs of fine bread, and sugar.

* Opuscula, 116.
**GRAMPUSS.**  **Class IV.**

26. **Grampus.**

**Orca Plinii, Lib. IX. c. 6.**

L'oudre ou grand marfouin.  
Beloń, 13.

**Orca. Rendel. 483.**  
Gefner  
**pfe. 635.**  
Lepér, Springer.  
Schonewelde, 53.

**Butskopf. Marten's Spitzberg.**  
124.

Balæna minor utraque maxilla dentata.  
Sib. Phalen. 7, 8.  
**Wil. iEth. 40.**  
Ratii Sym.  
**pfe. 15.**  
L'Epaulard.  
**Briſſon Cet. 236.**  
Delphinus orca.  
**Lin. fift. 108.**  
Lopare, Delphinus roltro fur-

**THIS species is found from the length of fifteen feet to that of twenty-five. It is re-
markably thick in proportion to its length, one of eighteen feet being in the thickest place ten feet diameter. With reason then did Pliny call this an immense heap of flesh, armed with dreadful teeth.**

It is extremely voracious, and will not even spare the porpese, a congenerous fish. It is said to be a great enemy to the whale, and that it will fasten on it like a dog on a bull, till the animal roars with pain.

The nose is flat, and turns up at the end. There are thirty teeth in each jaw; those before are blunt, round, and slender; the farthest sharp and thick: between each is a space adapted to receive the teeth of the opposite jaw when the mouth is closed.

* Cujus imago nulla representatione exprimi posset alia, quam carnis immensae dentibus truculentis.  
**Lib. IX. c. 6.**  

The
Class IV. GRAMPU S.

The spout hole is in the top of the neck. In respect to the number and site of the fins, it agrees with the dolphin.

The color of the back is black, but on each shoulder is a large white spot, the sides marbled with black and white, the belly of a snowy whiteness.

These sometimes appear on our coasts, but are found in much greater numbers off the North Cape in Norway, whence they are called the North Capers. These and all other whales are observed to swim against the wind, and to be much disturbed, and tumble about with unusual violence at the approach of a storm.

Linnaeus and Artedi say, that this species is furnished with broad serrated teeth, which as far as we have observed, is peculiar to the shark tribe. We therefore suspect that those naturalists have had recourse to Rondeletius, and copied his erroneous account of the teeth: Sir Robert Sibbald, who had opportunity of examining and figuring the teeth of this fish, and from whom we take that part of our description, giving a very different account of them.

It will be but justice to say, that no one of our countrymen ever did so much towards forming a general natural history of this kingdom as Sir Robert Sibbald: he sketched out a fine outline of the Zoology of Scotland, which comprehends the greatest part of the English animals, and, we are told, had
had actually filled up a considerable part of it: he published a particular history of the county of Fife, and has left us a most excellent history of the whales which frequent the coast of Scotland. We acknowledge ourselves much indebted to him for information in respect to many of those fish, few of which frequent the southern seas of these kingdoms, and those that are accidentally cast ashore on our coasts, are generally cut up by the country people, before an opportunity can be had of examining them.
Div. II. CARTILAGINOUS FISH.

This title is given to all fish whose muscles are supported by cartilages instead of bones, and comprehends the same genera of fish to which Linneus has given the name of amphibianantes: but the word amphibio, ought properly to be confined to such animals who inhabit both elements, and can live without any inconvenience for a considerable space, either in land or under water; such as tortoises, frogs, and several species of lizards; and among the quadrupeds, hippopotami, seals, &c. &c. This definition therefore excludes all that form this division.

Many of the cartilaginous fish are viviparous, being excluded from an egg, which is hatched within them. The egg consists of a white and a yolk, and is lodged in a case, formed of a thick tough substance, not unlike softened horn: such are the eggs of the Ray and Shark kinds.

Some again differ in this respect, and are oviparous; such is the Sturgeon, and others.

They breathe either through certain apertures beneath, as in the Rays; on their sides as in the Sharks, &c. or on the top of the head, as in the Pipe-fish; for they have not covers to their gills like the bony fish.
LAMPREY. Class IV.

IV. LAMPREY.

Slender Eel-shaped body.
Seven apertures on each side;
One on the top of the head.
No pectoral or ventral fins.

Lampreys are found at certain seasons of the year in several of our rivers, but the Severn is the most noted for them*. They are sea fish, but like salmon, quit the salt waters, and ascend the latter end of the winter, or beginning of spring, and after a stay of a few months return again to the ocean, a very few excepted. The best season for them is in the months of March, April, and May; for they are more firm when just arrived out of the salt water than they are afterwards, being observed to be much wasted, and very flabby at the approach of hot weather.

* They are also found in the most considerable of the Scotch and Irish rivers.
They are taken in nets along with salmon and shad, and sometimes in weels laid in the bottom of the river.

It has been an old custom for the city of Gloucester, annually, to present his majesty with a lamprey pye, covered with a large raised crust. As the gift is made at Christmas, it is with great difficulty the corporation can procure any fresh lampreys at that time, though they give a guinea a-piece for them, so early in the season.

They are reckoned a great delicacy, either when potted or stewed, but are a surfeiting food, as one of our monarchs fatally experienced, Henry the First's death being occasioned by a too plentiful meal of these fish. It appears that notwithstanding this accident, they continued in high esteem; for Henry the Fourth granted protections to such ships as brought over lampreys for the table of his royal comfort*. His successor issues out a warrant to William of Nantes, for supplying him and his army with lampreys, wheresoever they happen to march†. Directions are afterwards given that they should be taken between the mouth of the Seyne and Harfleur.

Lampreys are sometimes found so large as to weigh four or five pounds.

The mouth is round and placed rather obliquely below the end of the nose: the edges are jagged,

* Rymer, VIII. 429.
† Idem. IX. 544.
L A M P R E Y. C L A S S I V.

which enables them to adhere the more strongly to the stones, as their custom is, and which they do so firmly as not to be drawn off without some difficulty.

We have heard of one weighing three pounds, which was taken out of the Eel, adhering to a stone of twelve pounds weight, suspended at its mouth, from which it was forced with no small pains.

There are in the mouth twenty rows of small teeth, disposed in circular orders, and placed far within.

The color is dusky, irregularly marked with dirty yellow, which gives the fish a disagreeable look.

We believe that the ancients were unacquainted with this fish; so far is certain, that which Doctor Arbuthnot, and other learned men, render the word lamprey, is a species unknown in our seas, being the muræna of Ovid, Pliny, and others, for which we want an English name. This fish, the Lupus (our Bass) and the Myxo* (a species of mullet) formed that pride of Roman banquets, the Tripatinam†, so called according to Arbuthnot, from their being served up in a machine with three bottoms.

* Perhaps the species called by Rondeletius, Muge, and Maxon. de Pisc. P. 295.

† Atque ut luxu quoque aliqua contingat auctoritas figlinis, Tripatinam, inquit Fenechella, appellabatur, summa canarum lautitia. una erat Murænarum, altera Luporum, tertia Myxonis piscis. Plinii Hist. Nat. lib. XXXV. c. 12.
Class IV. Lesser Lamprey.

The words Lampetra and Petromyzon, are but of modern date, invented from the nature of the fish; the first a Lambendo petras, the other from Πετρες, and Μυσας, because they are supposed to lick, or suck the rocks.


Belon, 67.
Gesner pis. 597.
Lampetra medium genus. pinna dorfali posteriori angulata. Ibid.
Wil. Ichth. 106. Rafi syn. pis. 35.

This species sometimes grows to the length of ten inches.

The mouth is formed like that of the preceding. On the upper part is a large bifurcated tooth; on each side are three rows of very minute ones: on the lower part are seven teeth, the exterior of which on each side is the largest.

The irides are yellow. As in all the other species, between the eyes, on the top of the head, is a small orifice of great use to clear its mouth of the water that remains on adhering to the bones, for through that orifice it ejects the water in the same manner as cetaceous fish.

On the lower part of the back is a narrow fin, beneath that rises another, which at the beginning
is high and angular, then grows narrow, surrounds the tail, and ends near the anus.

**Color.**

The color of the back is brown or dusky, and sometimes mixed with blue; the whole under side silvery. These are found in the Thames, Severn, and Dee, are potted with the larger kind, and are by some preferred to it, as being milder tasted. Vast quantities are taken about Mortlake, and sold to the Dutch for bait for their cod fishery. Above 450,000 have been sold in a season at forty shillings per thousand. Of late, about 100,000 have been sent to Harwich for the same purpose. It is said that the Dutch have the secret of preserving them till the Turbot fishery.

---

**19. Pride.**

Une Civelle, un Lamproyon. *Pisc. 35.*

*Lamproyon branchialis. Lin.*

Belon, 67.

Lampetra parva et fluvialis. *Ibid. Pisc. 598.*


Lampreda minima. *Gesner.*

*Pisc. 598.*

Pride. Plot, Oxf. 182. Plate X.

Lampern, or Pride of the *Iffis.*


---

**We** have seen these of the length of eight inches, and about the thickness of a swan's quill, but they are generally much smaller.

They are frequent in the rivers near Oxford, particularly the *Iffis,* but not peculiar to that country.
ty, being found in others of the *Engliffin* rivers, where, instead of concealing themselves under the stones, they lodge themselves in the mud, and never are observed to adhere to any thing like other lampreys.

The body is marked with numbers of transverse lines, that pass cross the sides from the back to the bottom of the belly, which is divided from the mouth to the anus by a strait line.

The back fin is not angular like that of the former, but of an equal breadth. The tail is lanceolated, and sharp at the end.
82

SKATE.  CLASS IV.

V.  RAY.

Body broad, flat, and thin.
Five apertures on each side placed beneath:
Mouth situated quite below.

* With sharp teeth.

Oppian Halieut.  I. 103.  Raia varia, dorso medio gla-

Size.

This species is the thinnest in proportion to
its bulk of any of the genus, and also the
largest, some weighing near two hundred pounds.

Descrip.

The nose, though not long, is sharp pointed;
above the eyes is a set of short spines: the whole
upper part of that we examined was of a pale
brown.  Mr. Ray says, some he saw were streaked
with black: the lower part is white, marked
with great numbers of minute black spots.  The
jaws were covered with small granulated but sharp-
pointed teeth.

The tail is of a moderate length: near the
end are two fins: along the top of it is one row of
spines, and on the edges are irregularly dispersed
a few
a few others, which makes us imagine with Mr. Ray, that in this respect these fish vary, some having one, others more orders of spines on the tail.

It is remarked that in the males of this species the fins are full of spines.

Skates generate in March and April, at which time they swim near the surface of the water, several of the males pursuing one female. They adhere so fast together in coition, that the fishermen frequently draw up both together, though only one has taken the bait. The females begin to cast their purses, as the fishermen call them (the bags in which the young are included) in May, and continue doing it till September. In October they are exceedingly poor and thin; but in November they begin to improve, and grow gradually better till May, when they are in the highest perfection. The males go sooner out of season than the females.

In fishing in the Menai (the strait that divides Anglesea from Caernarvonshire) July 1768, we took...
took one of this species whose length was near seven feet, and breadth five feet two inches; when just brought on shore, it made a remarkable snorting noise.

The nose was very long, narrow, and sharp-pointed, not unlike the end of a spoutoon.

The body was smooth, and very thin in proportion to the size; the upper part ash colored, spotted with numerous white spots, and a few black ones.

The tail was thick; towards the end were two small fins, on each side was a row of small spines, with another row in the middle, which run some way up the back.

The lower part of the fish was quite white.

The mouth very large, and furnished with numbers of small sharp teeth bending inwards.

On its body we found the *hirudo muricata*, which adhered very strongly, and when taken off left a black impression.

This fish has been supposed to be the *Bos* of the antients, which was certainly some enormous species of *Ray*, though we cannot pretend to determine the particular kind: Oppian styles it,

Εὐφυταχ ἤ παντεσσι μετ' ἵχθουσιν.

Broadest among fishes.

He adds an account of its fondness of human flesh, and the method it takes of destroying men,
THORN-BACK.
by over-laying and keeping them down by its vast weight till they are drowned. Phile gives much the same relation*. We are inclined to give them credit, since a modern writer †, of undoubted authority, gives the very same account of a fish found in the South Seas, the terror of those employed in the pearl fishery. It is a species of ray, called there Manta, or the Quilt, from its surrounding and wrapping up the unhappy divers till they are suffocated; therefore the negroes never go down, without a sharp knife to defend themselves against the assaults of this terrible enemy.

Raia alteria aspera. Rondel. 352.
Gesner pisc. 794. Wil. Lib. 78.
Raia syn. pisc. 28.

I took this species in Loch Broom in the shire of

The length from the nose to the tip of the tail was two feet nine. The tail was almost of the same length with the body.

Nose very short. Before each eye a large hooked spine, and behind each another, beset with lessers. The upper part of the body of a cinereous brown

* De propriet. Anim. 85.
† Ulloa's voy. I. 132. 3vo. edit.
mixed with white, and spotted with black; and entirely covered with small spines. On the tail were three rows of great spines: all the rest of the tail was irregularly beset with lesser.

The fins, and under side of the body were equally rough with the upper.

The teeth were flat, and rhomboidal.

This species derives its Latin name from the instruments fullers make use of in smoothing cloth, the back being rough and spiney.

The nose is short and sharp. At the corner of each eye a few spines. The membrane of nictitation is fringed. Teeth small, and sharp.

On the upper part of the pectoral fins are three rows of spines pointing towards the back, crooked, like those on a fuller's instrument.

On the tail are three rows of strong spines: the middle row reaches up part of the back. The tail is slender, and rather longer than the body.

The color of the upper part of the body is cinereous, marked usually with numerous black spots;
Class IV. SHAGREEN RAY.

spots: the lower part is white. This, as well as most other species of Rays, vary a little in color, according to age.

This grows to a size equal to the Skate. It is common at Scarborough, where it is called the White Hans, or Gullet.

I MET with this species at Scarborough, where it is called the French Ray.

It encreases to the size of the Skate; is fond of Launces, or Sandeels, which it takes greedily as a bait.

The form is narrower than that of the common kinds: the nose long and very sharp: pupil of the eye, saphhirine: on the nose are two short rows of spines: on the corner of the eyes another of a semicircular form: on the tail are two rows, continued a little up the back, small, slender, and very sharp: along the sides of the tail is a row of minute spines, intermixed with innumerable little spicula. The upper part of the body is of a cinereous brown, covered closely with minute shagreen-like tubercles, resembling the skin of the dog-fish: the under side of the body is white: from the nose to the beginning of the pectoral fins is a tuberculated space.

The teeth slender, and sharp as needles.
MR. Travis, surgeon at Scarborough, had, in the summer of 1769, the tail of a Ray brought to him by a fisherman of that town: he had taken it in the sea off the coast, but flung away the body.

It was above three feet long, extremely slender and taper, and destitute of a fin at the end. I believe it to belong to the species called by the Brazilians Iaberete; and that it is likewise found in the Sicilian seas. I once received the tail of one from that island, corresponding with the description Mr. Travis gave: I must also add, that it was entirely covered with hard obtuse tubercles.
THE narcotic or numbing quality of this fish has been taken notice of in all ages: it is so powerful when the fish is alive, as instantly to deprive the person who touches it of the use of his arm, and even to affect him if he touches it with a stick. Oppian goes so far as to say, that it will benumb the astonished fisherman, even through the whole length of line and rod.
ELECTRIC RAY. CLASS IV.

Then to the fisher's hand as swift repairs:
Amaz'd he stands; his arm's of senfe bereft,
Down drops the idle rod; his prey is left:
Not less benumb'd, than if he had felt the whole
Of frost's severest rage beneath the arctic pole.

But great as its powers are when the fish is in vigor, they are impaired as it declines in strength, and totally cease when it expires. They impart no noxious qualities to it as a food, being commonly eaten by the French, who find them more frequently on their coasts than we do on ours.

Galen affirms, that the meat of the torpedo is of service to epileptic patients: and that the shock of the living fish applied to the head is efficacious in removing any pains in that part.

We may mention a double use in this strange power the torpedo is endued with; the one, when it is exerted as a means of defence against voracious fish, who are at a touch deprived of all possibility of seizing their prey.

The other is well explained by Pliny, who tells us, it attains by the same powers its end in respect to those fish it wishes to ensnare. Novit torpedo vim suam, ipsa non torpens; mentaque in limo se occultat piscium qui securi supernatantes obtorpuere, corripiens*.

* "The torpedo is well acquainted with its own powers, though itself never affected by them. It conceals itself in the mud, and benumbing the fish that are carelessly swimming about, makes a ready prey of them."

But
Class IV. Electric Ray.

But the acknowledgements of every naturalist are due to John Walsh, Esquire, for his curious and unwearyed researches into the nature of this fish; and for the first certainty we had of its being a native of our seas. To him I am particularly bound, for being enabled to correct my errors in the former account.

It is frequently taken in Torbay; has been once caught off Pembroke, and sometimes near Waterford in Ireland. It is generally taken, like other flat fish, with the trawl; but there is an instance of its taking a bait, which vindicates the fine account that Oppian has left us of this fish. It commonly lies in water of about forty fathoms depth; and in company with the congeneric Rays.

The torpedo brings forth its young at the autumnal equinox as affirmed by Aristotle. A gentleman of la Rochelle, on dissecting certain females of this species, the 10th of September, found in the matrices, several of the foetuses quite formed, and nine eggs, in no state of forwardness: superfoetation seems therefore to be a property of this fish.

The food of the torpedo is fish; a furmullet and a plaice having been found in the stomach of two of them. The furmullet is a fish of that swiftness, that it was impossible for the torpedo to take it by pursuit. It is probable, that by their electric stroke, they stuipify their prey; yet the crab and sea leech will venture to annoy them.

They
ELECTRIC RAY. Class IV.

They will live four and twenty hours out of the sea; and but very little longer if placed in fresh water.

They inhabit sandy places; and will bury themselves superficially in it, by flinging the sand over, by a quick flapping of all the extremities. It is in this situation that the torpedo gives his most forcible shock, which throws down the astonished passenger, who inadvertently treads upon him.

In our seas it grows to a great size, and above eighty pounds weight. My description was taken from a smaller, which I had the pleasure of doing in company with Mr. Walfh.

Its length was eighteen inches from the head to the tip of the tail; the greatest breadth twelve inches. I could not inform myself of the weight of this; but that of one, that measured four feet in length, and two and a half in breadth, was fifty-three pounds, avoirdupois.

The tail was six inches long; was pretty thick and round: the caudal fin broad and abrupt.

The head and body, which were indistinct, were nearly round; about two inches thick in the middle, attenuating to extreme thinness on the edges: below the body, the ventral fins formed on each side a quarter of a circle. The two dorsal fins were placed on the trunk of the tail.

The eyes were small, placed near each other: behind each was a round spiracle, with six small cutaneous rags on their inner circumference.

Mouth
**With blunt Teeth.**

La Raye bouclée. Belon 70.
Raia clavata. Rondel. 353.
Gefner pince. 795.
Steinroch. Sbornevelde, 59.
Thornback. Wil. Ichth. 74.

**THIS common fish is easily distinguished from the others by the rows of strong sharp spines, disposed along the back and tail. In a large one we saw, were three rows on the back, and five on the tail, all inclining towards its end.**

On the nose, and on the inner side of the forehead, near the eyes, were a few spines, and others were scattered without any order on the upper part of the pectoral fins.

The mouth was small, and filled with granulated teeth.

The upper part of the body was of a pale ash color, marked with short streaks of black, and the skin rough, with small tubercles like thagreen.
THORNBACK. CLASS IV.

The belly white, crossed with a strong semilunar cartilage beneath the skin: in general the lower part was smooth, having only a few spines on each side.

The young fish have very few spines on them, and their backs are often spotted with white, and each spot is encircled with black.

Food.

This species frequents our sandy shores, are very voracious, and feed on all sorts of flat fish, and are particularly fond of herrings and sand eels, and sometimes eat crustaceous animals, such as crabs.

These sometimes weigh fourteen or fifteen pounds, but with us seldom exceed that weight.

They begin to generate in June, and bring forth their young in July and August, which (as well as those of the skate) before they are old enough to breed, are called maids. The thornback begins to be in season in November, and continues so later than skate, but the young of both are good at all times of the year.
THE weapon with which nature has armed this fish, hath supplied the antients with many tremendous fables relating to it. Pliny, Ælian*, and Oppian, have given it a venom that affects even the inanimate creation: trees that are struck by it instantly lose their verdure and perish, and rocks themselves are incapable of resisting the potent poison.

The enchantress Circe, armed her son with a spear headed with the spine of the Trygon, as the most irresistible weapon she could furnish him with, and with which he afterwards committed parricide, unintentionally, on his father Ulysses.

That spears and darts might, in very early times, have been headed with this bone instead of iron, we have no kind of doubt: that of another species of this fish being still used to point the ar-
rows of some of the *South American Indians*, and is, from its hardnefs, sharpnefs, and beards, a moft dreadful weapon.

But in refpect to its venemous qualities, there is not the left credit to be given to the opinion, though it was believed (as far as it affected the animal world) by *Rondeletius, Aldrovand*, and others, and even to this day by the fishermen in fe-veral parts of the kingdom. It is in fact the wea-pon of offence belonging to the fish, capable of giv-ing a very bad wound, and which is attended with dangerous symptoms, when it falls on a tendi-nous part, or on a person in a bad habit of bo-dy. As to any fish having a spine charged with actual poison, we must deny our affent to it, though the report is fanctified by the name of *Lin-naeus*.

*Descrip.*

This species does not grow to the bulk of the o-thers; that which we examined was two feet nine inches from the tip of the nose to the end of the tail; to the origin of the tail one foot three inches; the breadth one foot eight.

The body is quite smooth, of a shape almost round, and is of a much greater thickness, and

*Syf. Nat. I. 348.* He instances the *Pffinaca, the Tor-pedo*, and the *Tetrodon lineatus*. The first is incapable of con-voying a greater injury than what results from the meer wound. The second, from its electric effluvia: and the third, by imparting a pungent pain like the fling of nettles, occaioned by the minute spines on its abdomen.
more elevated form in the middle than any other Rays, but grows very thin towards the edges.

The nose is very sharp pointed, but short; the mouth small, and filled with granulated teeth.

The irides are of a gold color: behind each eye the orifice is very large.

The tail is very thick at the beginning: the spine is placed about a third the length of the former from the body, is about five inches long, flat on the top and bottom, very hard, sharp pointed, and the two sides thin, and closely and sharply bearded the whole way. The tail extends four inches beyond the end of this spine, and grows very slender at the extremity.

These fish are observed to shed their spine, and to renew them annually; sometimes the new spine appears before the old one drops off, and the Cornish call this species Cardinal Triloft, or three tailed, when so circumstanced.

The color of the upper part of the body is a dirty yellow, the middle part of an obscure blue: the lower side white, the tail and spine dusky.
VI. SHARK.

Slender body growing less towards the tail.

Two fins on the back.

Rough skin.

Five apertures on the sides of the neck.

Mouth generally placed far beneath the end of the nose.

The upper part of the tail longer than the lower.

* Without the anal fin.


C. 5, &c. Athenæus, lib. VII. Monk, or Angel Fish. Rait

p. 319.


Squatina Plin. lib. IX. c. 12. 398. S. pinna ani nulla,

Rhina, sc. Squatus. lib. caudæ duabus, ore termin-

XXXII. c. 11. nali, naribus cirrosis. Ibid.

L'Ange, ou Angelot de mer. Sq. pinna ani carens, ore in

Belon 69. apice capitis. Aried. syn. 95.

Squatina. Rondel. 367. Gesner


THIS is the fish which connects the genus of Rays and Sharks, partaking something of the character of both; yet in an exception to each in the situation of the mouth, which is placed at the extremity of the head.

It is a fish not unfrequent on most of our coasts, where it prowls about for prey like others of the kind. It is extremely voracious, and, like the Ray,
Ray, feeds on flounders and flat fish, which keep at the bottom of the water, as we have often found on opening them. It is extremely fierce and dangerous to be approached. We knew an instance of a fisherman, whose leg was terribly tore by a large one of this species, which lay within his nets in shallow water, and which he went to lay hold of incautiously.

The aspect of these, as well as the rest of the genus have much malignity in them: their eyes are oblong, and placed lengthways in their head, sunk in it, and overhung by the skin, and seem fuller of malevolence than fire.

Their skin is very rough; the antients made use of it to polish wood and ivory*, as we do at present that of the greater dog-fish. The flesh is now but little esteemed on account of its coarseness and rankness, yet Archeôratus (as quoted by Atheneus, p. 319.) speaking of the fish of Miletus, gives this the first place in respect to its delicacy of the whole cartilaginous tribe.

They grow to a great size; we have seen them of near an hundred weight.

The head is large, the teeth broad at their base, but slender and very sharp above, and disposed in five rows all round the jaws. Like those of all Sharks, they are capable of being raised or depressed by means of muscles uniting them to the

* Qua lignum et eboræ poliuntur. *Plinii lib. 1X. c. 12.*

H 2 jaws
PICKED DOG FISH. CLASS IV.

jaws, not being lodged in sockets as the teeth of cetaceous fish are.

The tongue is large; the eyes small; the pupil of a pale green; the irides white, spotted with brown: behind each eye is a semiflunar orifice.

The back is of a pale ash color, and very rough; along the middle is a prickly tuberculated line: the belly is white and smooth.

The pectoral fins are very large, and extend horizontally from the body to a great distance; they have some resemblance to wings, so writers have given this the name it bears in this work.

The ventral fins are placed in the same manner, and the double penis is placed in them, which forms another character of the males in this and the last genus.

The tail is bisected, the upper lobe rather the longest: not very remote from the end on the back are two fins.


NAME.

THE picked dog fish takes its name from a strong and sharp spine placed just before each
of the back fins, distinguishing it at once from the 
rest of the British sharks.
The nose is long, and extends greatly beyond the 
mouth, but is blunt at the end.
The teeth are disposed in two rows, are small 
and sharp, and bend from the middle of each jaw 
towards the corners of the mouth.
The first back fin is placed nearer the head than 
the tail; the other is situated very near the latter.
The tail is finned for a considerable space be-
neath, and the upper part is much the longest.
The back is of a brownish ash color; the belly 
white.
It grows to the weight of about twenty pounds.
This species swarms on the coasts of Scotland, 
where it is taken, split and dried: and is a food 
among the common people. It forms a sort of in-
ternal commerce, being carried on women's backs, 
fourteen or sixteen miles up the country, and sold;
or exchanged for necessaries.

** With the anal fin.

*Squalus maximus. Sq. den-
tibus caninis, pinna dor-
fali anteriore majore. Syf. Sun-fish. Smith's hist. Cork, 
nat. 400. II. 292. Hist. Waterford,
Brugden. Squalus maximus. 271.

This species has been long known to the 
inhabitants of the south and west of Ireland
and
and Scotland, and those of Caernarvonshire and Anglesea; but having never been considered in any other than a commercial view, has till this time remained undescribed by any English writer; and what is worse, mistaken for and confounded with the luna of Rondeletius, the fame that our English writers call the sun-fish.

The Irish and Welsh give it the same name, from its lying as if to fun itself on the surface of the water; and for the same reason we have taken the liberty of calling it the basking shark. It was long taken for a species of whale, till we pointed out the branchial orifices on the sides, and the perpendicular site of the tail.

These are migratory fish, or at least it is but in a certain number of years that they are seen in multitudes on the Welsh seas, though in most summers a fingle and perhaps strayed fish appears. They inhabit the Northern seas, even as high as the arctic circle.

They visited the bays of Caernarvonshire and Anglesea in vast shoals, in the summers of 1756 *, and a few succeeding years, continuing there only the hot months, for they quitted the coast about Michaelmas, as if cold weather was disagreeable to them.

They appear in the Firth of Clyde; and among

* Some old people say they recollect the same sort of fish visiting these seas in vast numbers about forty years ago.
the Hebrides in the month of June, in small droves of seven or eight; but oftener in pairs. They continue in those seas, till the latter end of July, when they disappear.

They had nothing of the fierce and voracious nature of the shark kind, and were so tame as to suffer themselves to be stroked: they generally lay motionless on the surface, commonly on their bellies, but sometimes, like tired swimmers, on their backs.

Their food seemed to consist entirely of sea plants, no remains of fish being ever discovered in the stomachs of numbers that were cut up, except some green stuff, the half digested parts of algae, and the like. Linnaeus says, it feeds on medusas.

At certain times they were seen sporting on the waves, and leaping with vast agility several feet out of the water. They swim very deliberately, with the dorsal fins above water.

Their length was from three to twelve yards, and sometimes even longer.

Their form was rather slender, like others of the shark kind.

The upper jaw was much longer than the lower, and blunt at the end. The mouth placed beneath, and each jaw furnished with numbers of small teeth: those before were much bent, those more remote in the jaws were conic and sharp pointed.

On the sides of the neck were five large transverse apertures to the gills.

On the back were two fins; the first very large,
BASKING SHARK.  Class IV.

not directly in the middle, but rather nearer the head; the other small, and situated near the tail. On the lower part were five others; viz. two pectoral fins; two ventral fins, placed just beneath the hind fin of the back; and a small anal fin. Near these, the male had two genitals, as in other sharks; and between these fins was situated the pudendum of the female.

The tail was very large, and the upper part remarkably longer than the lower.

The color of the upper part of the body was a deep leaden; the belly white.

The skin was rough, like shagreen, but less so on the belly than the back.

Within side the mouth, towards the throat, was a very short sort of whalebone.

LIVER.

The liver was of a great size, but that of the female was the largest; some weighed above a thousand pounds, and yielded a great quantity of pure and sweet oil, fit for lamps, and also much used by the people who took them, to cure bruises, burns, and rheumatic complaints. A large fish has afforded to the captors a profit of twenty pounds. They were viviparous, a young one about a foot in length being found in the belly of a fish of this kind.

The measurements of one, I found dead on the shore of Loch Ranza in the isle of Arran, were as follow. The whole length twenty seven feet, four inches: first dorsal fin, three feet; second, one
one foot; pectoral fin, four feet; ventral, two feet; the upper lobe of the tail, five feet; the lower, three.

They will permit a boat to follow them, without accelerating their motion, till it comes almost within contact; when a harpooneer strikes his weapon into them, as near to the gills as possible. But they are often so insensible, as not to move till the united strength of two men have forced in the harpoon deeper. As soon as they perceive themselves wounded, they fling up their tail and plunge headlong to the bottom; and frequently coil the rope round them in their agonies, attempting to disengage the harpoon from them by rolling on the ground, for it is often found greatly bent.

As soon as they discover that their efforts are in vain, they swim away with amazing rapidity, and with such violence, that there has been an instance of a vessel of seventy tons having been towed away against a fresh gale. They sometimes run off with two hundred fathoms of line, and with two harpoons in them; and will employ the fishers for twelve, and sometimes twenty four hours before they are subdued. When killed, they are either hauled on shore, or if at a distance from land, to the vessel's side. The liver (the only useful part) is taken out, and melted into oil in kettles provided for that purpose. A large fish will yield eight barrels of oil; and two of worthless sediment.

The fishers observed on them a sort of leech of a reddish
WHITE SHARK. CLASS IV.

a reddish color, and about two feet long, but which fell off when the fish was brought to the surface of the water, and left a white mark on the skin.


Le chien carcharien ou Periz. plano dentibus ferratis.

fish de Norvege. Belon, 52, 87.

Aried. synon. 89. Gronov.

Zooph. No. 143.

SIZE.

THIS grows to a very great bulk, Gillius says, to the weight of four thousand pounds; and that in the belly of one was found a human corps entire, which is far from incredible, considering their vast greedines after human flesh.

They are the dread of the sailors in all hot climates, where they constantly attend the ships in expectation of what may drop overboard; a man that has that misfortune perishes without redemption: they have been seen to dart at him, like gudgeons to a worm. A master of a Guinea ship informed me, that a rage of suicide prevailed among his new bought slaves, from a notion the unhappy creatures had, that after death they should be restored
restored again to their families, friends, and country. To convince them at least that they should not re-animate their bodies, he ordered one of their corpfes to be tied by the heels to a rope, and lowered into the sea, and though it was drawn up again as fast as the united force of the crew could be exerted, yet in that short space the sharks had devoured every part but the feet, which were secured at the end of the cord.

Swimmers very often perish by them; sometimes they lose an arm or leg, and sometimes are bit quite asunder, serving but for two morsels for this ravenous animal: a melancholy tale of this kind is related in a *West India* ballad, preserved in Doctor Percy's Reliques of ancient English Poetry*.

The mouth of this fish is furnished with (sometimes) a fixfold row of teeth, flat, triangular, exceedingly sharp at their edges, and finely serrated. We have one that is rather more than an inch and an half long. *Grew* † says, that those in the jaws of a shark two yards in length, are not half an inch, so that the fish to which mine belonged must have been six yards long, provided the teeth and body keep pace in their growth ‡.

This dreadful apparatus, when the fish is in a

---

*Vol. I. 331.
† Rarities, 91.
‡ Fossil teeth of this fish are very frequent in Malta, some of which are four inches long.
STATE of repose, lie quite flat in the mouth, but when he seizes his prey, he has power of erecting them, by the help of a set of muscles that join them to the jaw.

The mouth is placed far beneath, for which reason these, as well as the rest of the kind, are said to be obliged to turn on their backs to seize their prey, which is an observation as antient as the days of Pliny*.

The eyes are large; the back broad, flat, and shorter than that of other sharks. The tail is of a semilunar form, but the upper part is longer than the lower. It has vast strength in the tail, and can strike with great force, so that the sailors instantly cut it off with an axe as soon as they draw one on board.

The pectoral fins are very large, which enables it to swim with great swiftness.

The color of the whole body and fins is a light ash.

The antients were acquainted with this fish; and Oppian gives a long and entertaining account of its capture. Their flesh is sometimes eaten, but is esteemed both coarse and rank.

* Omnia autem carnivora sunt talia et supina veæcantur. Lib. IX. c. 24.
Class IV. B L U E S H A R K.

Ælian relates strange things of the affection this species bears to its young: among others, he says, that it will permit the small brood, when in danger, to swim down its mouth, and take shelter in its belly. This fact has been since confirmed by the observation of one of our best ichthyologists *, and is no more incredible, than that the young of the Opossum should seek an asylum in the ventral pouch of its parent, a fact too well known to be contested. But this degree of care is not peculiar to the blue shark, but we believe common to the whole genus.

This species frequents many of our coasts, but particularly those of Cornwall during the pilchard season, and is at that time taken with great iron hooks made on purpose.

It is of an oblong form: the nose extends far beyond the mouth: it wants the orifices behind the eyes, which are usual in this genus: the nostrils are long, and placely transversely. Artedi remarks a triangular dent in the lower part of the back.

* Rondeletus, 388.
LONG-TAILED SHARK. CLASS IV.

The skin is smoother than that of other sharks: the back is of a fine blue color; the belly of a silvery white.

Linnaeus says, that its teeth are granulated; for our part we must confess it is a fish that has not come under our examination, therefore hope to be favored with an accurate description from some naturalist, who lives on the coast it haunts.

We may add, that Rondeletius says he was an eye-witness to its fondness for human flesh: that these fish are less destructive in our seas, is owing to the coolness of the climate, which is well known to abate the fierceness of some, as well as the venom of other animals.

44. Long-tailed. Aëlian Var. IX. c. 37. Cercus Caii opusc. 110.
Hift. Lib. I. c. 5. Squalus cauda longiore quam
Vulpes Plinii Lib. IX. c. 43. 96.

45. Tail.

THIS fish is most remarkable for the great length of the tail: the whole measure of that we had an opportunity of examining, was thirteen feet, of which the tail alone was more than six, the
LONG TAILED SHARK

XIV.
the upper lobe extending greatly beyond the lower, almost in a straight line.

The body was round and short: the nose short but sharp pointed: the eyes large, and placed immediately over the corners of the mouth, which was small, and not very distant from the end of the nose.

The teeth are triangular, and small for the size of the fish, and placed in three rows.

The back ash color: the belly white: the skin universally smooth.

The antients styled this fish Amphicetus, and Vulpes, from its supposed cunning. They believed, that when it had the misfortune to have taken a bait, it swallowed the hook till it got at the cord, which it bit off, and so escaped.

They are sometimes taken in our seas, and have been imagined to be the fish called the Thresher, from its attacking and beating the Grampus with its long tail, whenever that species of whale rises to the surface to breathe.

**O**ne that was taken on our coast the last year weighed twenty seven pounds, and its length was
was five feet; but they grew to a greater size, some, according to Artediush, weighing an hundred pounds.

The color of the upper part of the body and fins was a light cinereous; the belly white.

The nose was very long, flat, and sharp pointed; beyond the nostrils semitransparent. The nostrils were placed very near the mouth.

Behind each eye was a small orifice. The teeth were numerous, disposed in three rows, small, very sharp, triangular, and serrated on their inner edge.

The first back fin was placed about eighteen inches from the head; the other very near the tail.

The tail finned beneath, the upper part ended in a sharp angle.

This species is said by Rondeletius to be very fierce and voracious, even to pursue its prey to the edge of the shore.

Its skin and flesh has an offensive rank smell; therefore we suppose Mr. Dale gave it ironically the title of Sweet William*.

* Hist. Harwich, 420.
This species being remarkably spotted, may be the same known to antients by the names expressed in the synonomys; but they so frequently leave such slight notices of the animals they mention, that we are often obliged to add a doubtful mark (?) to numbers of them.

The weight of one we took was six pounds three ounces, and yet it measured three feet eight inches in length; so light are the cartilaginous fish in respect to their size.

The nose was short, and very blunt, not extending above an inch and a half beyond the mouth. The nostrils were large, placed near the mouth, and covered with a large angular flap: the head very flat.

The eyes were oblong, behind each a large orifice opening to the inside of the mouth.

The teeth small, sharp, smooth at their sides, strait, and disposed in four rows.
Both the back fins were placed much behind, and nearer the tail than in common.

The tail was finned, and below extended into a sharp angle.

The color of the whole upper part of the body, and the fins, was brown, marked with numbers of large distinct black spots: some parts of the skin were tinged with red; the belly was white.

The whole was most remarkably round, and had a strong smell.

The tendrils that issue from each end of the purse of this fish, are much more delicate and slender than those of any other; are as fine as Indian grass, and very much resemble it.

The female of this species, and we believe of other sharks, is greatly superior in size to the male; so that in this respect there is an agreement between the fish and the birds of prey*. They bring about nineteen young at a time: the fishermen believe that they breed at all times of the year, as they scarce ever take any but what are with young.

To this kind may be added, as a meer variety, the

Catulus maximus. Wil. tibb. 63. Rait. syn. pise. 22.
Squalus cinereus, pinnis ventralibus discretnis. Arted. syn. 97.
Squalus stellaris. Lin. sys. 399.

CLASS IV. LESSER SPOTTED DOG FISH.

The chief difference seeming to be in the color and the size of the spots; the former being grey, the latter fewer but larger than in the other.

Le muscarol? Belon, 64.
Catulus minor. Wil. Itah. 64.
Lesser Rough Hound, or Mor-
gay Rati syn. pisc. 22.
Squalus doro vario, pinnis

ventralibus concretis. Arted. 47. LESSER SPOTTED.

Squalus catulus. Lin. syft. 400.
Gronov. Zooph. No. 144.

THE weight of one that was brought to us by a fisherman was only one pound twelve ounces; the length two feet two inches: it is of a slender make in all parts.

The head was flat: the nostrils covered with a long flap: the nose blunt, and marked beneath with numerous small punctures: behind each eye was a small orifice: the back fins, like those of the former, placed far behind.

The ventral fins are united, forming as if it were but one, which is a sure mark of this species.

The tail finned like that of the greater dog fish.

The color is cinereous, streaked in some parts with red, and generally marked with numbers of small black spots; but we have observed in some that they are very faint and obscure.

The belly is white.

This species breeds from nine to thirteen young at
at a time, is very numerous on some of our coasts, and very injurious to the fisheries.


THIS species is called smooth, not that the skin is really so, but because it wants the spines on the back, which are the character of the second species, the Picked Dog.

The nose extends far beyond the mouth, and the end blunt; the holes behind the eyes are small; the back is less flat than that of others of this genus.

The first back fin is placed midway above the pectoral and ventral fins: the pectoral fins are small.

The tail forked, but the upper part is much the longest.

The teeth resemble those of a Ray, rough and sharp.

The color of the back and sides ash, and free from spots; the belly silvery.
SMOOTH SHARK.

The figure of this fish, engraved after a drawing by the Rev. Mr. Jago*, is preserved in Doctor Borlase's Natural History of Cornwall. As it is not attended with any account farther than that it is a Cornish fish, and a small species of shark, we are obliged to form the best description we can from the print.

The nose appears to be very long, slender towards the end, and sharp pointed. The mouth placed far beneath; the body very thick and deep, but extremely slender just at the setting on of the tail.

The first back fin is placed almost in the middle, the other pretty near the tail.

The belly very deep: the ventral and anal fins small.

The tail bifurcated; the upper fork a little longer than the lower.

* This gentleman was minister of Loo, in Cornwall, and appears to have been well acquainted with the History of Fish. He communicated figures of several of the Cornish fish, with a brief account of each to Petiver, at whose instance, as Doctor Derham tells us, in the preface to Mr. Ray's Itineraries, p. 69, he added them to the Synopsis Avium et piscium, p. 162. A few others of his drawings are also preserved in the Natural History of Cornwall, and seem to be executed with skill and accuracy.
This species was observed by my friend the Rev. Mr. Hugh Davies of Beaumaris, who favored me with the description, and an accurate drawing made from the fish taken in a neighboring wear.

The length was seven feet. The snout and body of a cylindrical form. The greatest circumference four feet eight inches.

The nose blunt. The nostrils small. The mouth armed with three rows of slender teeth*, flattened on each side, very sharp, and furnished at the base with two sharp processes. The teeth are fixed to the jaws by certain muscles, and are liable to be raised or depressed at pleasure.

The first dorsal fin was two feet eight inches distant from the snout, of a triangular form: the second very small, and placed near the tail.

The pectoral fins strong and large: the ventral and anal small.

The space between the second dorsal fin and the tail much depressed; the sides forming an acute angle. Above and below was a transverse fossule or dent.

The tail was in the form of a crescent, but the

* These teeth are often found fossil, and are styled by Lloyd Ornithoglossum, from their resemblance to a bird's tongue.
horns of unequal lengths: the upper one foot ten inches; the lower one foot one.

The whole fish was a lead color. The skin comparatively smooth, being far less rough than that of the lesser species of this genus.
COMMON ANGLER. Class IV.

VII. ANGLER.

One aperture behind each ventral fin.
Large, flat, and circular head and body.
Teeth numerous and small in the jaws, roof of the mouth, and on the tongue.
Pectoral fins broad and thick.

La Grenouille de mer, ou pescheufe. Le Diable de mer, Bauldroy & Pescheteau. Belon, 77.
Rana piscatrix. Rondel. 363.
Gefner pis. 813.

Sehegansis, secheteuffel, schetode. Schonevelde, 59.
Toad-fish, Frog-fish, or Sea-Devil. Wil. libib. 85. Ralii syn. pis. 29.
Lophius ore cirroso. Arted. syn. 87.
Lophius piscatorius. Lin. llyst. 402.

NAME.

THIS singular fish was known to the ancients by the name of Barpaacos, and Rana, and to us by that of the fishing frog, for it is of a figure resembling that animal in a tadpole state. Pliny takes notice of the artifice used by it to take its prey: Eminentia sub oculis cornicula turbato limo exercit, assillantes pisciculos attrahens, donec tam prope accedant, ut affiliat. “It puts forth the “slender horns it has beneath its eyes, enticing "by that means the little fish to play round, till "they
COMMON ANGLER.
Class IV. Common Angler.

"they come within reach, when it springs on them*.

The fishing frog grows to a large size, some being between four and five feet in length; and we have heard of one taken near Scarborough, whose mouth was a yard wide. The fishermen on that coast have a great regard for this fish, from a supposition that it is a great enemy to the dog fish †, and whenever they take it with their lines set it at liberty.

It is a fish of very great deformity: the head is much bigger than the whole body, is round at the circumference, and flat above: the mouth of a prodigious wideness.

The under jaw is much longer than the upper; the jaws are full of slender sharp teeth: in the roof of the mouth are two or three rows of the same: at the root of the tongue, opposite each other, are two bones of an elliptical form, thick set, with very strong sharp teeth.

The nostrils do not appear externally, but in the upper part of the mouth are two large orifices that serve instead of them.

* Cicero, in his second book De Natura Deorum, gives much the same account of this fish: Ranæ autem marinae dicuntur obruere sejus arena soleve, et moveri propè aquam, ad quas, quæsi ad escam, pisces cum accesserint, confici a ranis, atque confumi.

† The bodies of these fierce and voracious fish are often found in the stomach of the Fishing Frog.
COMMON ANGLER. Class IV.

On each side the upper jaw are two sharp spines, and others are scattered about the upper part of the head.

Immediately above the nose are two long tough filaments, and on the back three others; these are what Pliny calls cornicula, and says it makes use of to attract the little fish. They seem to me like lines flung out for that end: I therefore have changed the old name of Fishing Frog for the more simple one of Angler.

Along the edges of the head and body are a multitude of short fringed skins, placed at equal distances.

The ventral fins are broad, thick, and fleshy, are jointed like arms, and within side divided into fingers.

The aperture to the gills is placed behind, each of these is very wide, so that some writers have imagined it to be a receptacle for the young in time of danger.

The back fin is placed very low near the beginning of the tail: the anal fin is placed beneath, almost opposite the former.

The body grows slender near the tail, the end of which is quite even.

The color of the upper part of this fish is dusky, the lower part white; the skin smooth.

Fishing
Class IV. Long Angler. 123


This is a species at present unknown to us, except by description.

It is, says Doctor Borlase, of a longer form than the common kind: the head more bony, rough, and aculeated. It had no finlike appendages round the head, but on each side the thinner part of the body, beginning beneath the dorsal fin, and reaching within two inches of the tail, was a series of them, each three quarters of an inch in length.

At the end of the pectoral fins were spines an inch and three quarters in length; at the end of the tail others three quarters of an inch long.
STURGEON. Class IV.

VIII. STURGEON.

One narrow aperture on each side.
The mouth placed far below, tubular and without teeth.
The body long, and often angular.

53. STURGEON.

Acipenfer? Plinii Lib. IX. c. 17. Ovidii Halieut. ?
L'Efturgeon. Belon, 89.
Sturio. Gesner pifc.
Sturgeon. Wil. Ichth. 239.

That this is the Oυσκός of Dorion, as quoted by Athenæus, is very probable, as well from the account he gives of its form, as of its nature. He says its mouth is always open, with which it agrees with the Sturgeon, and that it conceals itself in the hot months: this shews it to be a fish of a cold nature, which is confirmed by the history of the European fish of this species, given by Mr. Forster *, in his Essay on the Volga, who relates that they are scarce ever found in that river.

* Phil. Trans. LVII. 352.
in spring or summer, but in vast quantities in autumn and winter, when they crowd from the sea under the ice, and are then taken in great numbers.

Whether the acipenser is the sturgeon of the moderns, may be doubted, otherwise Ovid would never have spoke of it as a foreign fish:

_Tuque peregrinis, Acipenser, nobilis undis._

And, thou, a fish in foreign seas renowned.

It being well known that it is not uncommon in the _Mediterranean_, and even in the mouth of the _Tiber_, at certain seasons; but this passage leaves us as much in the dark as to the particular species intended, by the word _acipenser_, as the description _Pliny_ has given us; for that philosopher relates, that its scales are placed in a contrary direction to those of other fish, being turned towards the mouth, which disagree with the character of all that are known at present. Whatever fish it might be, it was certainly the same with the _Elops_, or _Helops_, as appears from _Pliny_, who makes it _synonymous_ with the _acipenser_*, and from another line of the poet beforementioned:

_Et pretiosus Helops nostris incognitus undis._

The precious _Helops_ stranger to our seas.

The sturgeon annually ascends our rivers, but in no great numbers, and is taken by accident in the

* _Quidam eum Elopem vocant_. _Lib. IX. c. 17._
Sturgeon. Class IV.

Salmon nets. It seems a spiritless fish, making no manner of resistance when entangled, but is drawn out of the water like a lifeless lump. It is a fish that is seldom taken far out at sea, but frequents such parts as are not remote from the æstuaries of great rivers. It is admired for the delicacy and firmness of its flesh, which is white as veal, and extremely good when roasted. It is generally pickled. The most we receive comes either from the Baltic rivers, or North America: those cured at Pillau have been, till of late, in the greatest repute; but through the encouragement given by the society instituted for promoting trade and manufactures, the sturgeon from our colonies begins to rival those of the Baltic.

Great numbers are taken during summer in the lakes Frischebaff, and Curisch-baff near Pillau, in large nets made of small cord. The adjacent shores are formed into districts, and farmed out to companies of fishermen, some of which are rented for six thousand guilders, or near three hundred pounds per annum.

They are found in vast abundance in the American rivers in May, June, and July, at which time they leap some yards out of the water, and falling on their sides, make a noise to be heard in still weather at some miles distance*. Caviare is made of the roes of this, and also of

* Catesby Carol. App. 33.
all the other sorts of sturgeons, dried, salted, and packed up close. The best is said to be made of those of the Sterlet *, a small species frequent in the Yaik and Volga. Icthyocolla †, or ising-glass, is also made of the found of our fish, as well as that of the others, but the Beluga affords the best ‡.

The sturgeon grows to a great size, to the length of eighteen feet, and to the weight of five hundred pounds, but it is seldom taken in our rivers of that bulk. The largest we have known caught in those of Great Britain weighed four hundred and sixty pounds, which was taken about two years ago in the Esk, where they are more frequently found than in our southern waters.

* Strahlenberg's Hist. Russia, 337.
† Phil. Trans. LVII. 354. A very small quantity is made from this species, and that only designed as presents to great men, as Mr. Forster assured me.
‡ The antients were acquainted with the fish that afforded this drug. Pliny lib. XXXII. c. 7. mentions it under the name of Icthyocolla, and says, that the glue that was produced from it had the same title; and afterwards adds, that it was made out of the belly of the fish. The Mario, said by Pliny lib. IX. c. 15. to be found in the Danube and the Boryzhenes, was certainly of this genus, a cartilaginous fish (nullis oíibus spiní/ve interístiti) resembling a small porpessæ (Porculo maríno Jimílimus;) and very probably may be the same with the Beluga, which, according to Mr. Forster, Phil. Trans. LVII. 354. has a short blunt nose, agreeing in that respect with the porpessæ.

The
The nose is very long, slender, and ends in a point. The eyes are extremely small; the nostrils placed near them: on the lower part of the nose are four cirri or beards: the mouth is situated far beneath, is small, and unsupported by any jaw bones; neither has it any teeth. The mouth of a dead fish is always open. When alive it can close or open it at pleasure, by means of certain muscles.

The body is long, pentagonal, and covered with five rows of large bony tubercles: one row of which is placed on the back, and two on each side. The whole under side of the fish, from the end of the nose to the vent, is flat; on the back, not remote from the tail, is a single fin. It has besides two pectoral fins, two ventral, and one anal fin. The tail is bifurcated, but the upper part much longer than the lower.

The upper part of the body is of a dirty olive color; the lower part silvery; the middle of the tubercles white.

In the manner of breeding it is an exception among the cartilaginous fish, being like the bony fish oviparous, spawning in winter.
A very deep body, and as if cut off in the middle. 
Mouth small.
Two teeth only in each jaw.

Rondeletius has given this genus the syn
nonym of Orthragoriscus, as if it was that
which Pliny* intended by the same name; but
the account left us by that naturalist is so brief,
that we do not think ourselves authorized to place
it as a synonymous creature. He says no more
than that it was the greatest of fish, and that it
grunted when it was first taken, from which pro-
bably rose the name, for according to Athenaeus,
ἐχθραγορισς† was that given to a young pig.
We are inclined to believe, that this fish had
escaped the notice of Pliny, otherwise he must have
unavoidably made some remark on its striking
figure.

This fish grows to a great bulk: that which
was examined by Salvianus‡ was above a hun-

* Lib. XXXII. c. 2.
† Lib. IV. p. 140.
‡ Hist. Pisc. 155.
OBLONG DIODON. Class IV.

dred pounds in weight: and Doctor Borlace mentions another taken at Plymouth in 1734, that weighed five hundred.

In form it resembles a bream, or some deep fish cut off in the middle. The mouth is very small, and contains in each jaw two broad teeth, with sharp edges.

The eyes are little; before each is a small semilunar aperture; the pectoral fins very small, and placed behind them. The dorsal fin and the anal fin are high, and placed at the extremity of the body: the tail fin is narrow, and fills all the abrupt space between those two fins.

The color of the back is dusky, and dappled; the belly silvery: between the eyes and the pectoral fins are certain streaks pointing downwards. The skin is free from scales.

When boiled, it has been observed to turn into a glutinous jelly, resembling boiled starch when cold, and served the purposes of glue, on being tried on paper and leather. The meat of this fish is uncommonly rank: it feeds on shell-fish.

There seems to be no satisfactory reason for the old English name. Care must be taken not to confound it with the sun-fish of the Irish, which differs in all respects from this.

Orthragoriscus
Orthragorificus five Luna pificis. Rondel. 424.
Mola Salviani, the Sun-fish. Wil. Icth. 151. Rar i syn. pific. 51.
Oftracion cathetoplateus sub-rotundus inermis asper, pinnis pectoralibus hori- zontalibus, foraminibus quatuor in capite. Arted. ty-

This differs from the former, in being much shorter and deeper. The back and the anal fins are higher, and the aperture to the gills not semilunar, but oval. The situation of the fins are the same in both.

This species was taken off Penzance, and is engraved in Doctor Borlase’s Natural History of Cornwall, from one of Mr. Jago’s drawings. Both kinds are taken on the western coasts of this kingdom, but in much greater numbers in the warmer parts of Europe.

Mr. Brunnich informs us, that between Antibes and Genoa, he saw one of this species lie asleep on the surface of the water: a sailor jumped overboard and caught it.
Tetraodon lævigatus. *Lin. syf. 411.*

**T his species is common to Europe and South Carolina.** As yet only a single spécimen has been discovered in our seas; taken at Penzance in Cornwall.

The length was one foot seven: the length of the belly, when distended, one foot; the whole circumference in that situation two feet fix.

The form of the body is usually oblong, but when alarmed it has the power of inflating the belly to a globular shape of great size. This seems designed as a means of defence against fish of prey: as they have less means of laying hold of it; and are besides terrified by the numbers of spines with which that part is armed; and which are capable of being erected on every part.

The mouth is small: the irides white, tinged with red: the back from head to tail almost strait, or at least very slightly elevated; of a rich deep blue color. It has the pectoral, but wants the ventral fins. The dorsal is placed low on the back; the anal is opposite: the tail almost even divided by an angular projection in the middle: tail and fins brown.

The belly and sides are white, shagreened or wrinkled; and beset with innumerable small sharp spines, adhering to the skin by four processes.
LUMP SUCKER.

UNCTUOUS SUCKER.
Class IV. Lump Sucker.

Thick body, arched back.  
Ventral fins united.  
Four branchioptegous rays.

Seehaefs, Haffpodde. Scho-  
nevelde. 411.
Lump, or Sea-Owl, Scotis  
Cock paddle. Wil. Ichth.  
208. Rait sfn. pflc. 77.
Cyclopterus. Aried. sfnon.

This singular fish increases to the weight of seven pounds, and the length of nineteen inches: the shape of the body is like that of the bream, deep and very thick, and it swims edgeways. The back is sharp and elevated, the belly flat.

The irides are of a cherry color; lips, mouth, and tongue, of a deeper red: the jaws lined with innumerable small teeth; the tongue very thick; along the ridge of the back is a row of large bony tubercles; from above the eye to within a small space of the tail is another row; beneath that a third, commencing at the gills; and on each side the belly a fourth row, consisting of five tubercles like the other: the whole skin is rough, with small tubercles.

K 3

On
L U M P S U C K E R.  Class IV.

On the upper part of the back is a thick ridge improperly called a fin, being destitute of spines; beneath that is the dorsal fin, of a brownish hue, reaching within an inch of the tail: on the belly, just opposite, is another of the same form. The belly is of a bright crimson color: the pectoral fins are large and broad, almost uniting at their base. Beneath these is the part by which it adheres to the rocks, &c. It consists of an oval aperture, surrounded with a fleshy muscular and obtuse soft substance, edged with small threaded appendages, which concur as so many claspers: tail and vent fins purple.

By means of this part it adheres with vast force to any thing it pleases. As a proof of its tenacity we have known, that on flinging a fish of this species just caught, into a pail of water, it fixed itself so firmly to the bottom, that on taking the fish by the tail, the whole pail by that means was lifted, though it held some gallons, and that without removing the fish from its hold.

These fish resort in multitudes during spring to the coast of Sutherland, near the Ord of Caithness. The seals which swarm beneath, prey greatly on them, leaving the skins; numbers of which thus emptied float at that season ashore. It is easy to distinguish the place where seals are devouring this or any unctuous fish, by a smoothness of the water immediately above the spot: this fact is now established; it being a tried property of oil to still
CLASS IV. UNCTUOUS SUCKER.

still the agitation of the waves, and render them smooth *.

Great numbers of these fish are found in the Greenland seas during the months of April and May, when they resort near the shore to spawn. Their roe is remarkably large, which the Greenlanders boil to a pulp, and eat. They are extremely fat, which recommends them the more to the natives, who admire all oily food: they call them Nipisets, or Cat-fish, and take quantities of them during the season †.

This fish is sometimes eaten in England, being stewed like carp, but is both flabby and insipid.

Liparis. Arted. 177.

Cyclopterus Liparis C. corpore nudo, pinnis dorso-anali caudalique unitis. Lin. 414.

THIS fish takes the name of sea snail from the soft and unctuous texture of its body, resembling that of the land snail. It is almost transparent, and soon dissolves and melts away.

It is found in the sea near the mouths of great rivers. We have seen it in January full of spawn.

† Crantz's Hist. Greenland, I. 96.
UNCTUOUS SUCKER. Class IV.

Descrip. The length is five inches: the color when fresh taken a pale brown, sometimes finely streaked with a darker; the shape of the body round, but near the tail compressed sideways: the belly is white and very protuberant.

The head is large, thick, and round. There are no teeth in the mouth, but the jaws are very rough: the tongue very large: the eyes very small.

The orifice to the gills is very small. It has six branchioistegous rays.

The pectoral fins are very broad, thin, and transparent, and almost unite under the throat. The first ray next the throat is very long, extends far beyond the rest, and is as fine as a hair. Over the base of each is a sort of operculum, or lid, ending in a point: this is capable of being raised or depressed at pleasure.

Behind the head begins the dorsal fin, which extends quite to the end of the tail: the ventral fin begins at the anus, and unites with the other at the tail.

Beneath the throat is a round depression of a whitish color, like the impression of a seal, surrounded with twelve small pale yellow tubera, by which it is probable it adheres to the stones like the other species.
BIMACULATED SUCKER.

JURA SUCKER.

PL. XXII.

No. 59.
Tab. xxv. fig. 28. 177. Tab. 1. fig. 6, 7.

This species is found in *Cornwall*. I also discovered it in the Sound of *Jura*.

Its length is about four inches. The skin without scales, slippery, and of a dusky color. The body taper. The nose grows slenderer from the head, and ends round.

The teeth small. Before each eye is a small filament. Behind the eyes are two semilunar marks.

In the middle of the back an oval mark formed by small dots, of a whitish color. The dorsal fin lies near the tail, and consists of eleven rays: the anal is placed opposite, and has nine rays. The tail is rounded. The ventral have four rays, are joined by an intervening membrane with an oval depression in the middle. Beyond that is another strong membrane with a similar depression. By means of these instruments it adheres to stones or rocks.
XI. PIPE.

Nose long and tubular.
No orifice to the gills:
The breathing aperture on the hind part of the head.
No ventral fins.
The body covered with a strong crust.

Typhle altera. Géfner pîc. 1025.
Syngnathus corpore quadrangular. [gulo, pinnâ caudæ carens? Arted. Spec. 3. Syngnathus barbarus. S. pin-
nis caudæ anique nullis, corpore sexangulato? Lin. fîst. 417.]

This species, described by Sir Robert Sibbald, was two feet in length; that we ex-
amined only sixteen inches.
The nose was an inch long, compressed sideways, and the end of the lower mandible turned up: the aperture of the mouth was very small.
The irides were red, behind each eye was a deep brown line.
The body, in the thickest part, was about equal to a swan's quil, hexangular from the end of the dorsal fin; from thence to the tail quadrangular. The belly was slightly carinated, and marked along the middle with a dusky line. Under the tail commencing at the anus is a fulcus or groove, six inches
Class IV. Longer Pipe.

inches and a half long, covered by two longitudinal valves which concealed a multitude of young fish. On crushing this part, hundreds may be observed to crawl out.

The general color of the fish was an olive brown: the sides marked with numbers of bluish lines pointing from the back to the belly, which, in dried fish, seemed like the signs of so many joints. Those in a fresh subject ceased beyond the vent; all beyond that was spotted with brown.

The dorsal fin was narrow and thin, consisting of forty rays, was two inches long, and placed rather nearer to the head than the tail.

The vent was seven inches from the tip of the nose; the body to that orifice was of an equal thickness, but from thence tapered to a very small point, having no mark of a fin.

The pectoral fins had twelve rays; the anal three.

When this fish and the next species are dried, they appear covered with numbers of angular crusts, finely radiated from their centre.

As we want a generical name in our language for this genus, we call it the Pipe Fish, from its slender body.
Acus secunda species, five,
acus Aristotelis. Rondel. 229.
Typhle. Gesner pisæ. 1025.
Trummer, Meerschlangen.
Schoneveldt, 11.
Acus Aristotelis feu secunda.
Wil. Ith. 158. Rall syn.
pisæ. 47.
Syngnathus corpore medio
heptagono, caudâ pinnatâ.
Arted. synon. 2.
Syngnathus acus. S. pinnis
caudae anipectoralibusque
radiatis, corpore septem-
angulato. Lin. syf. 416.
Syngnathus cauda pinnata,

This is shorter and thicker than the former,
yet I have seen one of the length of sixteen
inches. The middle of the body in some is hexan-
gular, in others heptangular. Linnaeus constitutes
two species of them, his Syngnathus Typhle, and
his Syngnathus Acus; but we join with Doctor
Gronovius, in thinking them only varieties of the
same fish.

The mouth is formed like that of the former:
the irides are yellow: close behind the head are the
pectoral fins, which are small and short.

On the lower part of the back is one narrow
fin; beyond the vent the tail commences, which is
long and quadrangular.

At the extremity is a fin round and radiated.

The body is covered with a strong crust, ele-
gantly divided into small compartments.

The belly is white; the other parts brown.

Besides these species of hard-skinned Pipe fish,
we have been informed, that the Syngathus Hippocampus of Linnaeus, or what the English improperly call the sea horse, has been found on the southern shores of this kingdom.


Syngnathus teres, pinnis pec-toralibus caudaque carens. 62. Little.

Arte. synon. 2.
Syngnathusophidion. Lin. Fift.

417.
Hafnahl, Tangnipa. Fann.
Suec. No. 375.

The little pipe fish seldom exceeds five inches in length, is very slender, and tapers off to a point. It wants both the pectoral and tail fins; is covered with a smooth skin, not with a crust as the two former kinds are.

The nose is short and turns a little up; the eyes prominent.

On the back is one narrow fin.

This species is not viviparous: on the belly of the female is a long hollow, to which adhere the eggs, disposed in two or three rows. They are large, and not numerous.

The synonym of Serpent is used in several languages to express these fish: the French call one species Orueul, from a sort of snake not unlike the blindworm: the Germans call it Meberschlage; and the Cornish, the sea adder.

DIV.
Div. III. Bony Fish.

Sect. I. ApodAL.

XII. Eel.

Body long, slender, and slippery.
Nose tubular.
Back, ventral, and tail fins, united.
Aperture to the gills small, and placed behind the pectoral fins.
Ten branchioptegous rays.

Ael. Schonevelde, 14.

THE eel is a very singular fish in several things that relate to its natural history, and in some respects borders on the nature of the reptile tribe.

It is known to quit its element, and during night to wander along the meadows, not only for change.
change of habitation, but also for the sake of prey, feeding on the snails it finds in its passage.

During winter it beds itself deep in the mud, and continues in a state of rest like the serpent kind. It is very impatient of cold, and will eagerly take shelter in a whisp of straw flung into a pond in severe weather, which has sometimes been practised as a method of taking them. *Albertus* goes so far as to say, that he has known eels to shelter in a hay-rick, yet all perished through excess of cold.

It has been observed, that in the river *Nyne†*, there is a variety of small eel, with a lesser head and narrower mouth than the common kind, that it is found in clusters in the bottom of the river, and is called the *Bed-eel*: these are sometimes roused up by violent floods, and are never found at that time with meat in their stomachs. This bears such an analogy with the clustering of blindworms in their quiescent state, that we cannot but consider it as a further proof of a partial agreement in the nature of the two genera.

The ancients adopted a most wild opinion about the generation of these fish, believing them to be either created from the mud, or that the scrapings

*Gesner pis. 45.*

† Morton's Hist. Northampt. 419. Pliny observes, that the eels of the lake *Benacus* collect together in the same manner in the month of *Ostober*, possibly to retreat from the winter's cold. *Lib. ix. c. 22.*
of their bodies which they left on the stones, were animated and became young eels. Some moderns gave into these opinions, and into others that were equally extravagant. They could not account for the appearance of these fish in ponds that never were stocked with them, and that were even so remote as to make their being met with in such places a phenomenon that they could not solve. But there is much reason to believe, that many waters are supplied with these fish by the aquatic fowl of prey, in the same manner as vegetation is spread by many of the land birds, either by being dropped as they carry them to feed their young, or by passing quick thro' their bodies, as is the case with herons; and such may be occasion of the appearance of these fish in places where they were never seen before. As to their immediate generation, it has been sufficiently proved to be effected in the ordinary course of nature, and that they are viviparous.

Viviparous.

They are extremely voracious, and very destructive to the fry of fish.

No fish lives so long out of water as the eel: it is extremely tenacious of life, as its parts will move a considerable time after they are flayed and cut into pieces.

Descr.

The eel is placed by Linneus in the genus of Muræna, his first of the apodal fish, or such which want the ventral fins.

The eyes are placed not remote from the end of
the nose: the irides are tinged with red: the under jaw is longer than the upper: the teeth are small, sharp, and numerous: beneath each eye is a minute orifice: at the end of the nose two others, small and tubular.

The fish is furnished with a pair of pectoral fins, rounded at their ends. Another narrow fin on the back, uniting with that of the tail; and the anal fin joins it in the same manner beneath.

Behind the pectoral fins is the orifice to the gills, which are concealed in the skin.

Eels vary much in their colors, from a footy hue to a light olive green; and those which are called silver eels, have their bellies white, and a remarkable clearness throughout.

Besides these there is another variety of this fish known in the Thames by the name of Grigs, and about Oxford by that of Grigs or Gluts. These are scarce ever seen near Oxford in the winter, but appear in spring, and bite readily at the hook, which common eels in that neighbourhood will not. They have a larger head, a blunter nose, thicker skin, and less fat than the common sort; neither are they so much esteemed, nor do they often exceed three or four pounds in weight.

Common eels grow to a large size, sometimes so great as to weigh fifteen or twenty pounds, but that is extremely rare. As to instances brought by Dale and others, of these fish encreasing to a superior magnitude, we have much reason to suspect them
them to have been congers, since the enormous fish they describe, have all been taken at the mouths of the Thames or Medway.

The eel is the most universal of fish, yet is scarce ever found in the Danube, tho' it is very common in the lakes and rivers of Upper Austria.

The Romans held this fish very cheap, probably from its likeness to a snake.

Vos anguilla manet longae cognata colubra*,
Vernula riparum pinguis torrente cloaca.

For you, is kept a fink-fed snake-like eel.

On the contrary, the luxurious Sybarites were so fond of these fish, as to exempt from every kind of tribute the persons who sold them†.

* Juvenal. Sat. v. 103.
† Athenæus. Lib. xii. p. 521.
The conger grows to a vast size. Doctor Borlase, to whom we are obliged for several informations relating to this species, assures us, that they are sometimes taken near Mount's-Bay of one hundred pounds weight.

They differ from the common eel in the following particulars: 1. Their color in general is more dark. 2. Their eyes much larger in proportion. 3. The irides of a bright silvery color. 4. The lower jaw is rather shorter than the upper. 5. The side line is broad, whitish, and marked with a row of small spots; Mr. Ray says a double row, but we did not observe it in the fish we examined. 6. The edges of the dorsal and anal fins are black. 7. They have more bones than the common eel.

* We have heard of some taken near Scarborough that were ten feet and a half long, and eighteen inches in circumference in the thickest part.
especially along the back quite to the head. 8. They grow to a much larger size.

As to the distinction that Mr. Ray, and other writers, make of the small beards at the end of the nose, we think it not to be depended on, being sometimes found in both kinds, and sometimes entirely wanting.

We believe they generate like the fresh-water species: innumerable quantities, of what are supposed to be their fry, come up the Severn about the month of April, preceding the Shads, which it is conjectured migrate into that river to feed on them: they are called Elvers. They quite swarm during their season, and are taken in a kind of sieve made of hair-cloth, fixed to a long pole; the fisherman standing on the edge of the water during the tide, puts in his net as far as he can reach, and drawing it out again takes multitudes at every sweep, and will take as many during one tide as will fill a bushel. They are dressed, and reckoned very delicate.

Congers are extremely voracious, preying on other fish, and on crabs at the time they have lost their shell, and are in a soft state. They and eels in general are also particularly fond of carcasses of any kind, being frequently found lodged in such that are accidentally taken up.

These fish are an article of commerce in Cornwall; numbers are taken on that coast, and exported to Spain and Portugal, particularly to Barcelona.
Class IV. Conger.

celona. The quantities that were sent from Mount's-Bay for five years, were as follow:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cwt.</th>
<th>qr.</th>
<th>lb.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1756</td>
<td>46</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>1757</td>
<td>164</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>1758</td>
<td>164</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>1759</td>
<td>213</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>1760</td>
<td>71</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

Some are taken by a single hook and line, but (because that way is tedious, and does not answer the expense of time and labour) they are chiefly caught by Bulters, which are strong lines five hundred feet long, with sixty hooks, each eight feet asunder, baited with pilchards or mackerel: the Bulters are sunk to the ground by a stone fastened to them: sometimes such a number of these are tied together as to reach a mile.

We have been told that the fishermen are very fearful of a large conger, lest it should endanger their legs by clinging round them; they therefore kill them as soon as possible by striking them on the navel.

They are afterwards cured in this manner: they are salt, and hung on a frame till they dry, having a considerable quantity of fat, which it is necessary should exude before they are fit for use. It is remarkable that a conger of a hundred weight will waste by drying to twenty-four pounds; the

£ 3

people
people therefore prefer the smalleft, possibly be-
cause they are soonest cured. During the process
there is a considerable stench; and it is said that
in the fishing villages the poultry are fed with the
maggots that drop from the fish.

The Portuguese and Spaniards use those dried
congers after they have been ground into a powder,
to thicken and give a relish to their soups. We
think they are sold for about forty shillings the
quintal, which weighs one hundred and twenty-six
pounds.

A fishery of congers would be of great advan-
tage to the inhabitants of the Hebrides. Perhaps
they would at first undertake it with repugnancy,
from their absurd aversion to the eel kind.
Class IV. WOLFFISH.

Blunt head: long body.
One dorsal fin reaching almost from the head to the tail.
Fore teeth conic and large.
Grinders flat and round.
Seven branchioptegous rays.

Lupus marinus nostras, quem Kigutilik i. e. dentatus.
45. Tab. 5.
Cat-Fish. Sib. Scot. III. 25.
Tab. 16.
Wolf Fish, Sea Wolf, or Zee Wolf. Gronov. Mus. No.

This fish seems to be confined to the northern parts of the globe. We find it in the seas of Greenland, in those of Iceland* and Norway, on the coasts of Scotland, and of Yorkshire, and lastly, in that part of the German ocean, which washes the shores of Holland, the most southern of its haunts we can with any certainty mention.

* Where it is called Steinbeisser. Schonevelde, 45.

Place.
It is a most ravenous and fierce fish, and when taken fastens on any thing within its reach: the fishermen dreading its bite, endeavor as soon as possible to beat out its fore teeth, and then kill it by striking it behind the head. Schonevelde relates, that its bite is so hard that it will seize on an anchor, and leave the marks of its teeth in it; and the Danish and German names of Steenbider and Steinbeisser, express the sense of its great strength, as if it was capable of crushing even stones with its jaws.

It feeds almost entirely on crustaceous animals, and shell fish, such as crabs, lobsters, prawns, muscles, scollops, large whelks, &c. these it grinds to pieces with its teeth, and swallows with the lesser shells. It does not appear they are dissolved in the stomach, but are voided with the feces, for which purpose the aperture of the anus is wider than in other fish of the same size.

It is full of roe in February, March, and April, and spawns in May and June.

This fish has so disagreeable and horrid an appearance, that nobody at Scarborough except the fishermen will eat it, and they prefer it to holibut. They always before dressing take off the head and skin.

The sea wolf grows to a large size: those on the Yorkshire coast are sometimes found of the length of four feet, and, according to Doctor Gronovius, have been taken near Shetland seven feet long, and even
Class IV.  WOLF FISH.

even more. That which we examined was three feet two inches and an half from the tip of the nose to the end of the tail: the length of the head was eight inches, from the gills to the vent, ten; from thence to the tip of the tail, twenty and one half.

The circumference of the head was seventeen inches, at the shoulders twenty, but near the tail only four and a half.

Its weight was twenty pounds and a quarter.

The head is a little flattened on the top: the nose blunt; the nostrils very small; the eyes small, and placed near the end of the nose. Irids pale yellow.

The teeth are very remarkable, and finely adapted to its way of life. The fore teeth are strong, conical, diverging a little from each other, stand far out of the jaws, and are commonly six above, and the same below, though sometimes there are

only five in each jaw: these are supported within-side by a row of lesser teeth, which makes the number in the upper jaw seventeen or eighteen, in the lower eleven or twelve.

The sides of the under jaw are convex inwards, which greatly adds to their strength, and at the same time allows room for the large muscles with which the head of this fish is furnished.

The dentes molares, or grinding teeth of the under jaw, are higher on the outer than the inner edges, which inclines their surfaces inward: they join to the
the canine teeth in that jaw, but in the upper are separate from them.

In the centre are two rows of flat strong teeth, fixed on an oblong basis upon the bones of the palate and nose.

_Bufonites._ These and the other grinding teeth are often found fossil, and in that state called _Bufonites_, or _Toad-bones_: they were formerly much esteemed for their imaginary virtues, and were set in gold, and worn as rings.

The two bones that form the under jaw are united before by a loose cartilage, which mechanism admitting of a motion from side to side, most evidently contributes to the design of the whole, _viz._ a facility of breaking, grinding, and comminuting its testaceous and crustaceous food. At the entrance of the gullet, above and below, are two echinated bones: these are very small, being the less necessary, as the food is in a great measure comminuted in the mouth by aid of the grinders.

The body is long, and a little compressed sideways; the skin smooth and slippery: it wants the lateral line.

The pectoral fins consist of eighteen rays, are five inches long, and seven and a quarter broad.

The dorsal fin extends from the hind part of the head almost to the tail; the rays in the fresh fish are not visible.

The anal fin extends as far as the dorsal fin.
The tail is round at its end, and consists of thirteen rays.

The sides, back, and fins, are of a livid lead color; the two first marked downwards with irregular obscure dusky lines: these in different fish have different appearances. The young are of a greenish cast, resembling the sea wrack, which they reside amongst for some time after their birth.

We think ourselves much indebted to Mr. Travis, Surgeon, at Scarborough, for his ingenious remarks on this fish, as well as on several others that frequent that coast, being a gentleman much skilled in ichthyology, and extremely liberal in communicating his knowledge.
XIV. LAUNCE.

Head slender.

Body long and square.

Upper lip doubled in.

Dorsal and anal fin reaching almost to the tail.

Seven branchioptegous rays.


The launce is found on most of our sandy shores during some of the summer months: it conceals itself on the recess of the tides beneath the sand, in such places where the water is left, at the depth of about a foot, and are in some places dug out, in others drawn up by means of a hook contrived for that purpose. They are commonly used for baits for other fish, but they are also very delicate eating.

These fish are found in the stomachs of the Porpessæ, an argument that the last roots up the sand with its nose as hogs do the ground.

They grow sometimes the length of nine or ten inches;
Class IV. L A U N C E.

inches: the females are longer and slenderer than the males.

The form of the body is square, the sides are rounded, and the angles not sharp: it is nevertheless long and slender.

The head is small and taper; the under jaw much longer than the upper: the upper jaw is moveable, capable of being protruded, so that when open the gape is very wide.

The irides are silvery.

The dorsal fin runs almost the whole length of the back, is very narrow, and consists of fifty-eight rays: the pectoral fins small, and have twelve: the anus is placed much nearer the tail than the head, is narrow, and extends almost to the former.

The tail is forked, but the lobes rounded at their extremities.

The color of the back is blue, varying with green: on each side the back is a narrow dusky line or two. The sides and belly are silvery; the lateral line straight.
XV. MORRIS.
Small head.
Body extremely thin, compressed sideways.
No pectoral fins.


THIS species was discovered in the sea near Holyhead by the late Mr. William Morris, and, in memory of our worthy friend, we have given it his name. On receiving it from Mr. Morris, we communicated it to that accurate Ichthyologist, Doctor Laurence Theodore Gronovius, of Leyden, who has described it in his Zoophylacium, under the title of Leptocephalus, or small head.

Descrip.
The length was four inches; the head very small; the body compressed sideways, extremely thin, and almost transparent, about the tenth of an inch thick, and in the deepest part about one-third of an inch; towards the tail it grew more slender, and ended in a point; towards the head it sloped down, the head lying far beneath the level of the back.
The eyes large; the teeth in both jaws very small.
The lateral line straight; the sides marked with oblique strokes, that met at the lateral line.
The aperture to the gills large.

It wanted the pectoral, ventral, and caudal fins: the dorsal fin was extremely low, and thin, extending the whole length of the back very near the tail. The anal fin was of the same delicacy, and extended to the same distance from the anus.
The upper jaw extending to a great length, hard, slender, and pointed.

No teeth.

Eight branchioistegous rays.

Slender body.

T HIS fish sometimes frequents our coasts, but is much more common in the Mediterranean sea, especially in the part that separates Italy from Sicily, which has been long celebrated for it: the promontory Pelorus*, now Capo di Faro, was a place noted for the resort of the Xiphias, and possibly the station of the speculatores, or the persons who watched and gave notice of the approach of the fish.

* Athenaus, 314.
The antient method of taking them is particularly described by Strabo*, and agrees exactly with that practised by the moderns.

A man ascends one of the cliffs that overhangs the sea: as soon as he spies the fish, he gives notice either by his voice, or by signs, of the course it takes. Another, that is stationed in a boat, climbs up the mast, and on seeing the sword fish, directs the rowers towards it. As soon as he thinks they are got within reach, he descends, and taking a spear in his hand, strikes it into the fish, which, after wearying itself with its agitation, is seized and drawn into the boat. It is much esteemend by the Sicilians, who buy it up eagerly, and at its first coming into season give about six-pence English per pound. The season lasts from May till August†. The antients used to cut this fish into pieces, and salt it, whence it was called Tomus Thurianus‡, from Thurii, a town in the bay of Tarrentum, where it was taken and cured.

Kircher, in his Musurgia, has preserved a strange incantation used by the Sicilian fishermen, at the capture of the Pesce Spada, as they call it, which is expressed in the following unintelligible jargon:

* Lib. I. p. 16.
† Ray's Travels, I. 271.
‡ Tomus Thurianus, quem alii Xiphiam vocant. Plinii lib. XXXII. c. 11.
SWORD FISH.  

Class IV.

Mamassu di pajanu,
Paletta di pajanu,
Majusfu di itignela,
Palettu di paenu pale,
Pale la flagnetta,
Mancuta itigneta.
Pro naftu, vardu, pressu da
Vifu & da terra.

But this use of charmed words is not confined to Sicily; the Irish have their song at the taking of the razor shell, and the Cornish theirs, at the taking of the whittle fish.

The sword fish is said to be very voracious, and that it is a great enemy to the Tunny, who (according to Belon) are as much terrified with it as sheep are at the sight of a wolf.

Ac durus Xiphias, ictu non mitior ensis;
Et pavidi magno fugientes agmine Thunni.
     Ovid. Halieut. 97.

Sharp as a sword the Xiphias does appear;
And crowds of flying Tunnies struck with fear.

Size.

It grows to a very large size; the head of one, with the pectoral fins, found on the shore near Laugharn, in Caermarthenshire, alone weighing seventy-five pounds: the snout was three feet long, rough, and hard, but not hard enough to penetrate ships and sink them, as Pliny pretends.*

* Xiphiam, id est, Gladium, rostro mucronato esse, ab hoc naues perfossas mergi in oceano. Plin. Lib. xxxii. c. 11.

The
Class IV. SWORD FISH.

The snout is the upper jaw, produced to a great length, and has some resemblance to a sword, from whence the name. It is compressed at the top and bottom, and sharp at the point. The under jaw is four times as short as the upper, but likewise sharp pointed. The mouth is destitute of teeth.

The body is slender, thickest near the head, and growing less and less as it approaches the tail.

The skin is rough, but very thin: the color of the back is dusky, of the belly silvery.

The dorsal fin begins a little above the gills, and extends almost to the tail: it is highest at the beginning and the end, but very low in the middle: a little above the tail, on each side, the skin rises and forms two triangular protuberances, not unlike the spurious fins of the tuna.

The pectoral fins are long, and of a scythe-like form, and their first rays the longest.

The anus is placed at the distance of one-third part of the body from the tail; beneath are two anal fins.

The tail is exactly of the shape of a crescent.
Sect. II. JUGULAR.

XVII. DRAGONET.

Upper lip doubled.
Eyes near each other.
Two breathing apertures on the hind part of the head.
First rays of the dorsal fin very long.

69. GEMMEOUS.

La tierce espece de Exocet us? Belon, 218.
Dracunculus. Rondel. 304.
Dracunculus, aranei species altera. Gesner pis. 80.
Dragon fish. Marten's Spitzberg, 123.
Yellow Gurnard. Phil. Trans. No. 293.

NAME.

LINNÆUS has given this genus the name of Callionymus, a fish mentioned by several of the antients; but the notices they have left of it are so very slight, as to render it difficult to determine what species they intended. * Pliny makes it a synonym to the Uranoscopus, a fish frequent in the Italian seas, but very different from our Dragonet, a

* Lib. xxxii. c. 11.
PL.XXVII.

DRAGONET.
Class IV. GEMMEOUS DRAGONET.

name we have taken the liberty of forming, from the diminutive Dracunculus, a title given it by Rondeletius, and other authors. The English writers have called it the Yellow Gurnard, which having no one character of the Gurnard genus, we think ourselves obliged to drop that name.

It is found as far north as Norway* and Spitzbergen, and as far south as the Mediterranean sea, and is not unfrequent on the Scarborough coasts, where it is taken by the hook in thirty or forty fathoms water. It is often found in the stomach of the Cod-fish.

This species grows to the length of ten or twelve inches: the body is slender, round, and smooth.

The head is large, and flat at the top; in the hind part are two orifices, thro' which it breathes, and also forces out the water it takes in at the mouth, in the same manner as the cetaceous fish.

The apertures to the gills are closed: on the end of the bones that cover them is a very singular trifurcated spine.

The eyes are large, and placed very near each other on the upper part of the head, so that they look upwards; for which reason it has been ranked

* We have received it, with other curiosities, from that well-meaning prelate, Erich Pontoppidan, Bishop of Bergen. He was also Vice-Chancellor of the University of Copenhagen, in which station he died, December 20th. 1764, aged 66, much respected by his countrymen.

M 3 among
among the *Uranoscopii* : the pupils are of a rich sapphirine blue, the irides of a fine fiery carbuncle.

The upper jaw projects much farther than the lower : the mouth is very wide : the teeth are small.

The pectoral fins are round, and of a light-brown color; the ventral placed before them, are very broad, and consist of five branched rays.

The first dorsal fin is very singular, the first ray being fetaceous, and so long as to extend almost to the tail : those of the second dorsal fins are of a moderate length, except the last, which is produced far beyond the others.

The anus is placed about the middle of the belly; the anal fin is broad, and the last ray the longest. *Pontoppidan* calls this species the flying fish: whether it makes use of any of its fins to raise itself out of the water, as he was informed they did, we cannot pretend to say.

The tail is rounded and long, and consists of ten rays.

The side line is straight: the colors are yellow, blue, and white, and make a beautiful appearance when the fish has been just taken. The blue is of an inexpressible splendor, the richest cærulean glowing with a gemmeous brilliancy. The throat is black. The membranes of all the fins extremely thin and delicate.
THIS species we received from Mr. Travis.

Its length was only six inches and an half.

The head was compressed; the forehead sloped down to the nose, being not so level as that of the preceding.

The eyes large, and almost contiguous.

The mouth small; the teeth very minute.

Over the gills was a strong trifurcated broad spine.

The first dorsal fin had four rays; the first seateceous, extending a little higher than the others, the last very short: the two first rays and webs were yellow, the others black.

The second had ten soft rays, their ends extending beyond the webs, which were pellucid.

The pectoral fins consisted of twenty rays, and were ferruginous, spotted with a deeper cast of the same: the ventral fins consisted of five broad and much branched rays, like those of the first species.

The anal fin was white, and had ten rays; the tail had ten rays. In both species they are bifurcated at their ends, and the ray next the anal fin in both is very short.
SORIDID DRAGONET.  CLASS IV.

In colors this is far inferior to the former, being of a dirty yellow, mixed with white and dusky spots; the belly is entirely white.
The qualities of this fish were well known to the antients, who take notice of them without any exaggeration: the wounds inflicted by its spines are exceedingly painful, attended with a violent burning, and most pungent shooting, and sometimes with an inflammation that will extend from the arm to the shoulder.*

It is a common notion that these symptoms proceed from the habit of body the person is in, or the part in which the wound is given.

* It is probable that the malignity of the symptoms arises from the habit of body the person is in, or the part in which the wound is given.
ceed from something more than the small wound this fish is capable of inflicting; and that there is a venom infused into it, at least such as is made by the spines that form the first dorsal fin, which is dyed with black, and has a most suspicious aspect. The remedy used by a fisherman in our neighbourhood is the sea sand, with which he rubs the place affected for a considerable time. At Scarborough, stale urine, warmed, is used with success.

This fish buries itself in the sands, leaving only its nose out, and if trod on immediately strikes with great force; and we have seen them direct their blows with as much judgment as fighting cocks. Notwithstanding this noxious property of the spines, it is exceeding good meat.

**Name.**

The English name seems to have no meaning, being corrupted from the French, *la vive*, so called as being capable of living long out of the water, according to the interpretation of Belon.

**Descrip.**

It grows to the length of twelve inches, but is commonly found much less.

The irides are yellow: the under jaw is longer than the upper, and slopes very much towards the belly: the teeth are small.

The back is straight, the sides flat, the belly pro-

*In the Universal Museum for November 1765, is an instance of a person who was reduced to great danger by a wound from this fish, and who was cured by the application of sweet oil, and taking opium and venice treacle,*
minent, the lateral line straight: the covers of the gills are armed with a very strong spine.

The first dorsal fin consists of five very strong spines, which, as well as the intervening membranes are tinged with black; this fin, when quiet, is lodged in a small hollow.

The second consists of several soft rays, commences just at the end of the first, and continues almost to the tail. The pectoral fins are broad and angular; the ventral fins small.

The vent is placed remarkably forward, very near the throat: the anal fin extends to a small distance from the tail, is a little hollowed in the middle, but not so much as to be called forked.

The sides are marked lengthways with two or three dirty yellow lines, and transversely by numbers of small ones: the belly silvery.

Draco major seu araneus. Salvin, 70.
Greater Weever, Tour Scotland, 1769, octavo.

THE length eleven inches: greatest depth one and three quarters: head flat: eyes large: edges of the jaws rough with minute teeth: lower jaw the longest: head covered with minute tubercles: cheeks and gills with minute scales: on the gills is a sharp spine.

First dorsal fin black, with five spines: the second reaches almost to the tail: in the pectoral fins are thirteen branched rays: in the ventral, six: the anal extends opposite to the second dorsal fin: tail large, triangular, even at the end.

The scales run in oblique lines from the back to the belly, with a division between each row.

Inhabits the sea near Scarborough.

Head
COMMON COD FISH. CLASS IV.

XIX.

COD FISH.

Head smooth.
Seven slender branchiostegous rays.
Body oblong; scales deciduous.
All the fins covered with a common skin.
Ventral fins slender, and ending in a point.
Teeth in the jaws; and in the palate, a series of minute teeth closely set together.

* With three dorsal fins; the chin bearded.

73. Common. La Morue. Belon, 121. Gadus doro tripterygio, ore
Molva. Rondel. 280. cirrato, caudæ æquali fere
Molva five morhua altera. cum radio primo spinofo.
Gesner pisé. 88.

T

HIS fish is found only in the northern part of the world; it is, as Rondeletius calls it, an ocean fish, and never met with in the Mediterranean sea*. It affects cold climates, and seems confined between the latitudes 66 and 50: what are caught north and south of those degrees being

* None (says Captain Armstrong in his history of Minorca) of the Aselli or cod fish kind, frequent our shores. p. 163.

either
either few in quantity, or bad in quality. The
Greenland fish are small and emaciated through want
of food, being very voracious, and having in those
seas a dearth of provision.

This locality of situation is common to many
other species of this genus, most of them being in-
habitants of the cold seas, or such that lie within
zones that can just claim the title of temperate.
There are nevertheless certain species found near the
Canary Islands, called Cherny *, of which we know
no more than the name; but according to the un-
fortunate Captain Glass, are better tasted than the
Newfoundland kind.

The great rendezvous of the cod fish is on the
Banks of Newfoundland, and the other sand banks
that lie off the coasts of Cape Breton, Nova Scotia,
and New England. They prefer those situations,
by reason of the quantity of worms produced in
those sandy bottoms, which tempt them to resort
there for food: but another cause of the particular
attachment the fish have to these spots, is their vi-
cinity to the polar seas, where they return to spawn;
there they deposit their roes in full security, but
want of food forces them, as soon as the first more
southern seas are open, to repair thither for sub-
fistence.

Few are taken north of Iceland, but on the south
and west coasts they abound: they are again found

* Hift. Canary Islands, 198.
to swarm on the coasts of Norway, in the Baltic, off the Orkney and the Western Isles; after which their numbers decrease, in proportion as they advance towards the south, when they seem quite to cease before they reach the mouth of the Straits of Gibraltar.

Before the discovery of Newfoundland, the greater fisheries of cod were on the seas of Iceland, and off our Western Isles, which were the grand resort of ships of all the commercial nations; but it seems that the greatest plenty was met with near Iceland. The English resorted thither before the year 1415: for we find that Henry V. was disposed to give the King of Denmark satisfaction for certain irregularities committed on those seas by his subjects. In the reign of Edward the IV. the English were excluded from the fishery by treaty; and forbidden to resort there under pain of forfeiture of life and goods. Notwithstanding this, our monarch afterwards gave licence to a ship of Hull to sail to Iceland, and there relade fish and other goods, without regard to any restrictions to the contrary. Our right in later times was far from being confirmed, for we find Queen Elizabeth condescending to ask permission to fish in those seas from Christian the IV. of Denmark, yet afterwards she so far repented her request, as to instruct her embassadors to that court, to insist on the right of a free and universal fishery*. How far she succeeded, I do

* Rymer's Fæd. XVI. 275, 425.
not know: but it appears, that in the reign of her successor, our countrymen had not fewer than a hundred and fifty ships employed in the Iceland fishery. I suppose this indulgence might arise from the marriage of James with a Princess of Denmark.

But the Spanish, the French, and the Bretons, had much the advantage of us in all fisheries at the beginning, as appears by the state of that in the seas of Newfoundland in the year 1578*, when the number of ships belonging to each nation stood thus:

Spaniards, 100, besides 20 or 30 that came from Biscay, to take whale for train, being about five or six thousand tons.
Portuguese, 50, or three thousand tons.
French and Bretons, 150, or seven thousand tons.
English, from 30 to 50.

But Mr. Anderson, in his Dictionary of Commerce, I. 363, says, that the French began to fish there so early as 1536; and we think we have somewhere read, that their first pretence for fishing for cod in those seas, was only to supply an English convent with that article.

The increase of shipping that resort to those fertile banks, are now unspeakable: our own country still enjoys the greatest share, which ought to be esteemed our chiefest treasure, as it brings wealth to individuals, and strength to the state.

COMMON COD FISH. CLASS IV.

All this immense fishery is carried on by the hook and line only *; the bait is herring, a small fish called a Capelin, a shell fish called Clams, and bits of sea fowl; and with these are caught fish sufficient to find employ for near fifteen thousand British seamen, and to afford subsistence to a much more numerous body of people at home, who are engaged in the various manufactures which so vast a fishery demands.

Food.

The food of the cod is either small fish, worms, testaceous, or crustaceous animals, such as crabs, large whelks, &c. and their digestion is so powerful, as to dissolve the greatest part of the shells they swallow. They are very voracious, and catch at any small body they perceive moved by the water, even stones and pebbles, which are often found in their stomachs.

The Sounds.

Fishermen are well acquainted with the use of the air-bladder or sound of the cod, and are very dexterous in perforating this part of a live fish with a needle, in order to disengage the inclosed air; for without this operation it could not be kept under water in the well-boats, and brought fresh to market. The sounds of the cod salted is a delica-

* We have been informed that they fish from the depth of fifteen to sixty fathoms, according to the inequality of the Bank, which is represented as a vast mountain, under water, above five hundred miles long, and near three hundred broad, and that seamen knew when they approach it by the great swell of the sea, and the thick mists that impend over it.
Class IV. Common Cod Fish.

Isinglass is also made of this part by the Iceland fishermen: as the process may be of service to instruct the natives of the North of Scotland where these fish are plentiful, I beg leave to give it in the Appendix, extracted from a useful paper on the subject, in the Ph. Tr. of 1773, by Humphrey Jackson, Esq.

Providence hath kindly ordained, that this fish, so useful to mankind, should be so very prolific as to supply more than the deficiencies of the multitudes annually taken. Leuwenboek counted nine millions three hundred and eighty-four thousand eggs in a cod fish of a middling size, a number sure that will baffle all the efforts of man, or the voracity of the inhabitants of the ocean to exterminate, and which will secure to all ages an inexhaustible supply of grateful provision.

In our seas they begin to spawn in January, and deposit their eggs in rough ground, among rocks. Some continue in roe till the beginning of April. The cod fish in general recover quicker after spawning than any other fish, therefore it is common to take some good ones all the summer. When they are out of season they are thin tailed and loufy, and the lice chiefly fix themselves on the inside of their mouths.

The fish of a middling size are most esteemed for the table, and are chosen by their plumpness and roundness, especially near the tail, by the depth of the fulcus or pit behind the head, and by
COMMON COD FISH  CLASS IV.

the regular undulated appearance of the sides, as if they were ribbed. The glutinous parts about the head lose their delicate flavor after it has been twenty-four hours out of the water, even in winter, in which these and other fish of this genus are in highest season.

Size.

The largest that we ever heard of taken on our coasts, weighed seventy-eight pounds, the length was five feet eight inches; and the girth round the shoulders five feet. It was taken at Scarborough in 1755, and was sold for one shilling. But the general weight of these fish in the Yorkshire seas, is from fourteen to forty pounds.

Descrip.

This species is short in proportion to its bulk, the belly being very large and prominent.

The jaws are of an equal length, at the end of the lower is a small beard; the teeth are disposed in the palate as well as jaws.

The eyes are large.

On the back are three soft fins; the first has fourteen, the two last nineteen rays a-piece. The ventral fins are very slender, and consist but of six rays; the two first extending far beyond the other. It has two anal fins; the first consisting of twenty, the last of sixteen rays.

The tail is almost even at the end: the first ray on each side is short, and composed of a strong bone.

The color of this fish is cinereous on the back and sides, and commonly spotted with yellow: the belly
belly is white, but they vary much, not only in color* but in shape, particularly that of the head.

The side line is white and broad, strait, till it reaches opposite the vent, when it bends towards the tail.

Aigrefin, ou aiglefin. Belon. 118.
Tertia afellorum species. Rondel. 277.
Afellus minor, Schelsfisch. Schonevelde. 18.


Our countryman Turner conjectured this species to have been the Ov®, or Afinus, of the antients, and Belon that it was the Kf®, and the Πγόκατος of Oppian. We have carefully consulted most of the antient naturalists, but cannot discover any marks by which we can determine the species they intended. The words† Ov®, ‡ Afinus,

* Codlings are often taken of a yellow, orange, and even red color, while they remain among the rocks, but on changing their place assume the color of other cod fish.
‡ Ovidii Halieut. Lin. 131. Plinii Lib. IX. c. 16. 17.
Afellus, * Callarias, and Bacchus, are familiarly applied to several of our species of cod fish by the more modern writers; yet the antients from whom they are borrowed, have not authorized the application to any particular kind, either by description or any other method.

Different reasons have been assigned for giving the name of Ov® or Afinus to this genus, some imagining it to be from the color of the fish, others because it used to be carried on the backs of asses to market; but we shall drop this uncertain subject, and proceed to what we have fuller assurance of.

**Season.**

Large hadocks begin to be in roe the middle of November, and continue so till the end of January; from that time till May they are very thin tailed, and much out of season. In May they begin to recover, and some of the middling-sized fish are then very good, and continue improving till the time of their greatest perfection. The small ones are extremely good from May till February, and some even in February, March, and April, viz. those which are not old enough to breed.

The fishermen assert, that in rough weather hadocks sink down into the sand and ooze in the bottom of the sea, and shelter themselves there till the storm is over, because in stormy weather they take none, and those that are taken immediately

* Lib. c. 17.
after a storm are covered with mud on their backs.

In summer they live on young herrings and other small fish; in winter on the stone-coated worms *, which the fishermen call hadock meat.

The grand shoal of hadocks comes periodically on the Yorkshire coasts. It is remarkable that they appeared in 1766 on the 10th of December, and exactly on the same day in 1767: these shoals extended from the shore near three miles in breadth, and in length from Flamborough head to Tynemouth castle, and perhaps much farther northwards. An idea may be given of their numbers by the following fact: three fishermen, within the distance of a mile from Scarborough harbour, frequently loaded their coble or boat with them twice a-day, taking each time about a ton of fish: when they put down their lines beyond the distance of three miles from the shore, they caught nothing but dog fish, which shows how exactly these fish keep their limits.

The best hadocks were sold from eightpence to a shilling per score, and the poor had the smaller sort at a penny, and sometimes a halfpenny per score †.

The large hadocks quit the coast as soon as they

* A species of Serpula.

† Here Mr. Travis, to whom I am much obliged for a most accurate account of the Yorkshire fish, with great humanity projects an inland navigation, to convey at a cheap and easy method, those gifts of Providence to the thousands of poor manufacturers who inhabit the distant parts of that vast county.
go out of season, and leave behind great plenty of small ones. It is said that the large ones visit the coasts of Hamburgh and Jutland in the summer.

It is no less remarkable than providential, that all kinds of fish (except mackrel) which frequent the Yorkshire coast, approach the shore, and as if it were offer themselves to us, generally remaining there as long as they are in high season, and retire from us when they become unfit for use.

It is the commonest species in the London markets. They do not grow to a great bulk, one of fourteen pounds being of an uncommon size, but those are extremely coarse; the best for the table weighing from two to three pounds.

The body is long, and rather more slender than those of the preceding kinds: the head slopes down to the nose: the space between the hind part of the first dorsal fin is ridged: on the chin is a short beard.

On the back are three fins resembling those of the common cod-fish: on each side beyond the gills is a large black spot. Superstition assigns this mark to the impression St. Peter left with his finger and thumb when he took the tribute out of the mouth of a fish of this species, which has been continued to the whole race of hadocks ever since that miracle.

The lateral line is black: the tail is forked.

The color of the upper part of this species is dusty.
duddy or brown; the belly and lower part of the side silver.

*Irides* silver: pupil large and black.


**This** species never grows to a large size, seldom exceeding a foot in length.

It is distinguished from all others by its great depth; one of the size abovementioned being near four inches deep in the broadest part.

The back is very much arched, and carinated. The scales larger than those of the cod fish. The mouth small; the beard short. On each side of the lower jaw are seven or eight punctures.

The first doral fin is triangular, and terminates in a long fibre: the color of the fins and tail black; at the bottom of the pectoral fins is a black spot.

The lateral line is white, broad, and crooked.

The tail is even at the end, and of a dusty color.
The color of the body is white, but more obscure on the back than the belly, and tinged with yellow.

It is called at Scarborough a Kleg. It is a very delicate fish.

**BIB.**


Gadus dorfo tripterygio, oré cirrato, officulo pinarum ventralium primo in longam fetam produeto. Arted. synon. 35.

Gadus luscus. Lin. syn. 437.

**T**his species grows to the length of one foot.

The greatest depth three inches and a half. The scales are large, and so far from adhering to the skin, as is asserted by naturalists, are extremely deciduous.

The body is deep, the sides compressed. The eyes covered with a loose membrane, which it can blow up at pleasure, like a bladder. The mouth is small: beneath the chin a beard, an inch long.

In the first dorfal fin twelve rays: in the second, which is longest, twenty-three: in the third, twenty. The pectoral fins about sixteen: the ventral fix or seven, of which the first ray is long, and feta-

ceous:
Class IV. Poor.

ceous: the first anal fin has twenty-seven; the last twenty-one rays.

The back is of a light olive: the sides finely tinged with gold: the belly white: the anal fins dusky, edged with pure white; the tail with black.


This is the only species of cod fish with three dorsal fins that we (at this time) are assured is found in the Mediterranean sea. It is taken near Marseilles, and sometimes in such quantities as to become a nuisance; for no other kinds of fish are taken during their season*. It is esteemed good, but incapable of being salted or dried: Belon says, that when it is dried in the sun, it grows as hard as horn; C'est dela que les Anglois l'ont nommé Bouclizs horn.

It is the smallest species yet discovered, being little more than six inches long.

On the chin is a small beard: the eyes are covered

* Rondel. 191.
COAL FISH. Class IV.

versed with a loose membrane: on the gill-covers, and the jaws are on each side, nine punctures.

The first dorsal fin has twelve rays; the second nineteen; the third seventeen.

The pectoral fins thirteen; the ventral fins six: the first anal fin twenty-seven; the second seventeen.

The color on the back is a light brown; on the belly a dirty white.

We owe the discovery of this kind in our seas to the Rev. Mr. Jago.

** Three dorsal fins: chin beardless.

Colfischn Anglorum. Gesner pis. Gadus dorso tripterygio, ore 89. imberbi, maxilla inferiore
Col fish Septentrionalium Cole fish Septentrionalium anglorum. Rawlin Pollack

The coal fish takes its name from the black color that it sometimes assumes. Belon calls it the Colfischn, imagining it was so named by the English, from its producing the Icthyocolla, but Gesner gives the true etymology.
These fish are common on most of our rocky and deep coasts, but particularly those of the north of Great Britain. They swarm about the Orknies, where the fry are the great support of the poor.

The young begin to appear on the Yorkshire coast the beginning of July in vast shoals, and are at that time about an inch and an half long. In August they are from three to five inches in length, and are taken in great numbers with the angling rod, and are then esteemed a very delicate fish, but grow so coarse when they are a year old that few people will eat them. Fish of that age are from eight to fifteen inches long, and begin to have a little blackness near the gills, and on the back, and the blackness increases as they grow older.

The fry is known by different names in different places: they are called at Scarborough Parrs, and when a year old, Billets. About nine or ten years ago such a glut of Parrs visited that part, that for several weeks it was impossible to dip a pail into the sea without taking some.

Tho' this fish is so little esteemed when fresh, yet it is salted and dried for sale; a person last year having cured above a thousand at Scarborough.

The coal fish is of more elegant form than the cod fish: they generally grow to the length of two feet and an half, and weigh about twenty-eight or thirty pounds at most. The head is small; the under jaw a little longer than the upper:
the irides silvery, marked on one side with a black spot.

It has three dorsal fins, the first consists of fourteen, the next of twenty, the last of twenty-two rays.

The pectoral fins of eighteen; the ventral of six: the first anal fin of twenty-two, the second of nineteen.

The tail is broad and forked.

These fish vary in color. We have seen some whose back, nose, dorsal fins and tail were of a deep black: the gill covers silver and black: the ventral and anal fins white; the belly of the same color.

We have seen others dusky, others brown, but in all the lateral line was straight and white, and the lower part of the ventral and anal fins white.

This species is common on many of our rocky coasts: during summer they are seen in
Class IV. Pollack.

in great shoals frolicking on the surface of the water, and flinging themselves into a thousand forms. They are at that time so wanton as to bite at any thing that appears on the top of the waves, and are often taken with a goose's feather fixed to the hook. They are a very strong fish, being observed to keep their station at the feet of the rocks in the most turbulent and rapid sea.

They are a good eating fish: they do not grow to a very large size; at left the biggest we have seen did not exceed six or seven pounds: but we have heard of some that were taken in the sea near Scarborough, which they frequent during winter, that weighed near twenty-eight pounds. They are there called Leets.

The under jaw is longer than the upper; the head and body rises pretty high, as far as the first dorsal fin.

The side line is incurvated, rising towards the middle of the back, then sinking and running straight to the tail; it is broad, and of a brown color.

The first dorsal fin has eleven rays, the middle nineteen, the last sixteen: the tail is a little forked.

The color of the back is dusky, of some inclining to green: the sides beneath the lateral line marked with lines of yellow; the belly white.
WHITINGS appear in vast shoals in our seas in the spring, keeping at the distance of about half a mile to that of three from the shore. They are caught in vast numbers by the line, and afford excellent diversion.

They are the most delicate, as well as the most wholesome of any of the genus, but do not grow to a large size; the biggest we ever saw* not exceeding twenty inches, but that is very uncommon, the usual length being ten or twelve.

It is a fish of an elegant make: the upper jaw is the longest; the eyes large, the nose sharp, the teeth of the upper jaw long, and appear above the lower when closed.

The first dorsal fin has fifteen rays, the second eighteen, the last twenty.

* We have been informed that whittings, from four to eight pounds in weight, have been taken in the deep water at the edge of the Dogger-Bank.
Class IV. H A K E.

The color of the head and back is a pale brown; the lateral line white, and is crooked; the belly and sides silvery; the last streaked lengthways with yellow.

** With only two dorsal fins.

Le Merluz. Belon, 115.
Afellus, óνος, óνισιόνος. Rondel.
272. Merlucius. Gænner p. 84.
The Hake. Raïi fyn. p.ISC.

A FISH that is found in vast abundance on many of our coasts, and of those of Ireland. There was formerly a vast stationary fishery of Hake on the Nymph Bank off the coast of Waterford, immense quantities appearing there twice a year; the first shoal coming in June, during the Mackrel season, the other in September, at the beginning of the Herring season, probably in pursuit of those fish: it was no unusual thing for six men with hooks and lines to take a thousand Hake in one night, besides a considerable quantity of other fish. These were salted and sent to Spain, particularly to
H A K E. Class IV.

to Bilboa. * We are at this time uninformed of the state of this fishery, but find that Mr. Smith, who wrote the history of the county of Waterford, complains even in his time (1746) of its decline. Many of the gregarious fish are subject to change their situations, and desert their haunts for numbers of years, and then return again. We see, p. 102, how unsettled the Basking Shark appears to be: Mr. Smith instances the loss of the Hadock on the Waterford shores, where they used to swarm; and to our knowledge we can bring the capriciousness of the herrings, which so frequently quit their stations, as another example.

Sometimes the irregular migration of fish is owing to their being followed and harassed by an unusual number of fish of prey, such as the shark kind.

Sometimes to deficiency of the smaller fish, which served them as food.

And lastly, in many places to the custom of trawling, which not only demolishes a quantity of their spawn, which is deposited in the sand, but also destroys or drives into deeper waters numberless worms and insects, the repast of many fish.

The hake is in England esteemed a very coarse fish, and is seldom admitted to table either fresh or salted †.

* Smith's Hist. Waterford, 261.
† When cured it is known by the name of Poor John.
Class IV. Forked Hake.

These fish are from a foot and an half to near twice that length: they are of a slender make, of a pale ash color on their backs, and of a dirty white on their bellies.

Their head is flat and broad; the mouth very wide; the teeth very long and sharp, particularly those of the lower jaw.

The first dorsal fin is small, consisting of nine rays; the second reaches from the base of the former almost to the tail, and is composed of forty rays, of which the last are the highest: the pectoral fins have about twelve, the ventral seven: the anal thirty-nine.

The tail is almost even at the end.


This is the fish to which Rondeletius gives the name of Phycis, borrowing it from Aristotle and Pliny, who have not so sufficiently characterized it, as to enable us to judge what species they intended. It is found in the Mediterranean more frequently than in our seas, and we believe is the fish mentioned by Mr. Armstrong, and Doctor Clegborn.

* Armstrong, 161. Clegborn, 43.
in their histories of Minorca, under the name of Molio, Mollera, and Molle. It is known on the coast of Cornwall by the name of the great forked beard*, where it was first discovered by Mr. Jago. We place it in this genus, as it has more the appearance of the cod fish kind, the hake especially, than of the Blenny, into which genus Linnaeus has flung it; we therefore have given this species the name of the Forked Hake.

The length of one that was taken on the Flintshire shores was eleven inches and a half, its greatest depth three inches; but according to Doctor Borlase, some grow to be above eighteen inches long.

The head sloped down to the nose in the same easy manner with others of this genus: the mouth large: besides the teeth in the jaws was a triangular congeries of small teeth in the roof of the mouth.

At the end of the lower jaw was a small beard. The first dorsal fin was triangular; the first ray extended far beyond the rest, and was very slender: the second fin began just behind the first, and extended almost to the tail: the ventral fins were three inches long, and consisted of only two rays, joined at the bottom, and separated or bifurcated towards the end: the vent was in the middle of the body: the anal fin extended from thence just

* Barbus major Cornubienfis cirris bifurcatis: the great forked beard. Mr. Jago. Rau. syn. pisc. 163. fig. 7.
Class IV. L E S T H A K E.

to the tail: the lateral line was incurvated: the tail was rounded.
The color was a cinereous brown.


W E never saw this species, and having but very imperfect descriptions of it, cannot with any certainty pronounce it to be of this genus, but are unwilling to separate them, as we found them united by that judicious Ichthyologist Mr. Jago.

It is said not to exceed five inches in length: the first dorsal fin (in the print) is shorter than that of the preceding; the second resembles that of the other kind: the ventral fins bifurcated. It has a small beard, and a rounded tail, but the head is shorter and more steep; the color black, the skin smooth, and the appearance disagreeable.
THIS new species was communicated to me by the Reverend Mr. Hugh Davies of Beau-
maris, and was taken near that place.

Its length was twelve inches: the color a deep brown; excepting the folding of the lips, which were now white, giving it a strange appearance.

The head depressed and very broad: eyes large: irides yellowish: mouth very wide, with irregular rows of incurved teeth. In the roof of the mouth a semilunar congeries of teeth. No tongue.

From the setting on of the pectoral fins the body was compressed, but remarkably so, as it approached the tail, growing very slender near that part. On the beginning of the back was a fulcus, in which was the rudiment of a first dorsal fin; the second reached almost to the tail, and the anal corresponded. Above the pectoral fins, on each side, was a row of tubercles from which commenced the lateral line, which was (midway) incurvated. The ventral fins were trifurcated: the tail rounded.

In a prone situation this fish made a strange appearance, so is represented in that as well as another attitude.

Molva major Charleton ex. pisc. 3.


Ling. Wil. Ictb. 175. Rait

THE ling takes its name from its length, being corrupted from the word long. It abounds about the Scilly Isles, on the coasts of Scarborough, and those of Scotland and Ireland, and forms a considerable article of commerce.*

In the Yorkshire seas they are in perfection from the beginning of February to the beginning of May, and some till the end of that month. In June they spawn, depositing their eggs in the soft opzy ground of the mouth of the Tees: at that time the males separate from the females, and resort to some rocky ground near Flamborough Head, where the fishermen take great numbers without ever finding any of the female or roed fish among them.

While a ling is in season its liver is very white, and abounds with a fine flavored oil; but as soon

* This branch of trade was considerable so long ago as the reign of Edward III. an act for regulating the price of Lob, Ling, and Cod, being made in his 31st year.
as the fish goes out of season, the liver becomes red as that of a bullock, and affords no oil. The same happens to the cod and other fish in a certain degree, but not so remarkably as in the ling. When the fish is in perfection, a very large quantity of oil may be melted out of the liver by a slow fire, but if a violent sudden heat be used for that purpose, they yield very little. This oil, which nature hoards up in the cellular membranes of fishes, returns into their blood, and supports them in the engendering season, when they pursue the business of generation with so much eagerness as to neglect their food.

Vast quantities of ling are salted for exportation, as well as for home consumption. When it is cut or split for curing, it must measure twenty-six inches or upwards from the shoulder to the tail; if less than that it is not reckoned a sizeable fish, and consequently not entitled to the bounty on exportation; such are called Drizzles, and are in season all summer.

Descrip.

The usual size of a ling is from three to four feet, but we have heard of one that was seven feet long.

The body is very slender; the head flat; the upper jaw the longest; the teeth in that jaw small and very numerous; in the lower, few, slender, and sharp: on the chin is a small beard.

The first dorsal fin is small, placed near the head, and consists of fifteen rays: the second is very long, reaching
reaching almost to the tail, and consists of sixty-five rays: the pectoral fins have fifteen radiated rays; the ventral fins six; the anal sixty-two: the tail is rounded at the end.

These fish vary in color, some being of an olive hue on the sides and back, others cinereous; the belly white. The ventral fins white: the dorsal and anal edged with white. The tail marked near the end with a transverse black bar, and tipt with white.

Strinhas, ou Botatrisa. Belon, 300.  
Lota. Rondel. fluviat. 165.  
Gesner pisc. 599.  
Quappen, Elff-quappen, Ti-der-quappen, Truschen?  
Sebenevelde, 49.  
Burbot, or Bird-bolt. Plot  
Staff. 241. Tab. 22. fig. 4.  
Mustela fluviatilis nostratibus  

Eel-pout. Wil. Ichb. 125. 86. Burbot.  
Ratt syn. pisc. 67.  
Gadus dorso dipterygio, ore cirrato, maxillis aequalibus.  
Arted. synon. 38.  
Gadus Lota. Lin. fisst. 440.  

This fish is found in the Trent, but in greater plenty in the river Witham, and in the great East Fen in Lincolnshire. It is a very delicate fish for the table, though of a disgusting appearance when alive. It is very voracious, and preys on the fry and lesser fish. It does not often take a bait, but is generally caught in weels.

It abounds in the lake of Geneva, where it is called
ed *Lota,* and it is also met with in the *Lago Maggiore,* and *Lugano.*

**Descrip.**

The largest that we ever heard was taken in our waters weighed between two and three pounds, but abroad they are sometimes found of double that weight.

Their body has some resemblance to that of an eel, only shorter and thicker, and its motions also resemble those of that fish: they are besides very smooth, slippery, and slimy.

The head is very ugly, being flat, and shaped like that of a toad: the teeth are very small, but numerous: the irides yellow.

On the end of the nose are two small beards; on the chin another; the number of its branchiosteogous rays are seven.

The first dorsal fin is short: the second is placed immediately behind it, and extends almost to the tail: the pectoral fins are rounded: the ventral fins consist of six rays, of which the two first are divided near their ends from each other: the vent is placed in the middle of the belly, and the anal fin reaches almost to the tail: the tail is rounded at the end.

The color of this species varies; some are dusky, others of a dirty green, spotted with black, and oftentimes with yellow, and the belly in some is white; but the real colors are frequently concealed by the slime.

Mufella
This species commonly frequents the rocky shores of these islands, and is sometimes taken with a bait.

It grows to the length of nineteen inches; the weight two pounds two ounces: the head is large and flat: the eyes not remote from the end of the nose: the body is long, slender, and compressed sideways, especially towards the tail: at the end of the upper jaw are two beards; on the chin one.

The teeth are numerous and small, disposed along the jaws in form of a broad plate: in the roof of the mouth is a set of small teeth, disposed in a triangular form.

The number of branchiofis'egous rays is seven.

The first dorsal fin is lodged in a deep furrow just beyond the head, and consists of a number of short unconnected rays: the second rises just behind it, and reaches very near the tail: the pectoral fins are broad and round: the ventral fins small; the second ray the longest: the anal fin reaches almost to the tail: the tail rounded at the end.

The scales are very small: the color of the body and head a reddish yellow, marked above the lateral line
line with large black spots: the back fin and tail are darker; the vent fin of a brighter red, but all are spotted. The lateral line bends in the middle, then passes straight to the tail.

MR. Willughby makes this species with five beards, a variety only of the former; but having opportunity of examining several specimens, we must dissent from his opinion, having always observed the number of the beards in the spotted kind not to exceed three; nor the number in the brown kind to be less than five. The first ray of the dorsal fin is very long. There is also some difference in the form as well as color, this species being rather thicker in proportion than the former.

Excepting these particulars, and the number of beards, there is a general agreement in the parts of both. The beards on the upper jaw are four, viz. two at the very end of the nose, and two a little above them: on the end of the lower jaw is a single one.

These fish are of a deep olive brown, their belly whitish.
Class IV. TORSK.

203

whitish. They grow to the same size as the former.

The Cornish fishermen are said to whistle, and make use of the words Bod, Bod, vean, when they are desirous of taking this fish, as if by that they facilitated the capture. In the same manner the Sicilian fishermen repeat their Mamasu di pajanu, &c. when they are in pursuit of the Sword Fish*.

** With only one dorsal fin.

This fish has been hitherto supposed to be of the section of this genus, which has three dorsal fins. The species known in Sweden by that name is included in that division; and as such I described it in the former edition from the account Linnaeus has given us. But from the information of the Rev. Mr. Low, minister of Birsa, Orkney, who in 1774, made (at my request) the voyage of the Shetland islands, I find the British Torfs to be totally different; and will occasion the addition of a fourth division in this genus.

The Torfs is described and engraved in Mr. Strom's history of Sondmoer, under the same name.†

* Vide p. 162.

The
The figure agrees with that Mr. Low favoured me with.

The Torfk, or as it is called in the Shetlands, Tuusk and Brismak is a northern fish; and as yet undiscovered lower than about the Orknies, and even there it is rather scarce. In the seas about Shetland, it swarms, and forms (barrelled or dried) a considerable article of commerce.

The length of the specimen, Mr. Low described for me, was twenty inches, the greatest depth four and a half.

The head small, the upper jaw a little longer than the lower: both jaws furnished with multitudes of small teeth: on the chin was a small single beard: from the head to the dorsal fin was a deep furrow. The dorsal fin began within six inches from the tip of the nose, and extended almost to the tail.

The pectoral fins small, and rounded; the ventral short, thick and fleshy, ending in four cirrhi.

The belly from the throat grows very prominent: the anal fin was long, and reached almost close to the tail, which is small and circular. The number of rays could not be counted with accuracy by reason of their softness, and the thickness of the skin: the side line scarcely discernible.

The color of the head dusky: the back and sides yellow: belly white: edges of the dorsal, anal, and caudal fins white: the other parts dusky: the pectoral fins brown.

I flatter myself, that in a small time, the pub-
lie will receive from Mr. Low, a fuller account of this important fish, in a comprehensive history of the islands of Orkney, and Shetland.
XX. BLENNY*. Head blunt at the end, and very steep.
Body smooth and slippery.
Teeth slender.
Body compressed sideways.
Ventral fins constricting generally of only two united rays.
One dorsal fin.
Six branchioptegous rays.

* With a crested head.

90. CRESTED. Adonis, ou exocetus. Belon, syn. pisé. 73.

Blennius cristat capitis transversa cutacea. Arted. synon. 444.
Blennius Galerita. Lin. Syst.

THIS species is found, though not frequently, on our rocky shores, and is commonly about four or five inches long.

On the head is a small crest-like fin, which it

* There being no English name for this genus, Blenny is given it, derived from the word Blennius, the generical term used by Artedius, who forms it from Brèva mucus, it being of a flimsy nature.
Class IV. Gattorugin.

can erect or depress at pleasure. On the top of the head, between the eyes, is a triangular lump pointing backwards, and red about its edges.

The skin at the corner of the upper jaw is loose, and projects.

From the hind part of the head, almost to the tail, extends the dorsal fin: the ventral fin is small: the vent is placed under the ends of the pectoral fins.

The body is smooth and slippery: the color brown, and spotted.

Scorpioides. Rendel. 204. oculos, pinna ani ocellorum viginti trium. Arted.
Gesner p.fic. 847.
Gattorugine Venetii. Wil. synon. 44.
Blennius pinnulis duabus ad pisf. 442.

This curious kind was discovered to be a British fish on the Anglesea coast.

Its length was seven inches and an half: the body was smooth, and compressed on the sides: the belly a little prominent: the vent situated as in the preceding fish.

The teeth slender, almost setaceous, and very close set: between the eyes was a small hollow, and above each, just on the summit, was a narrow loose membrane, trifurcated at the top, which distinguishes this from all other species.

The
SMOOTH BLENNY. CLASS IV.

The pectoral fins broad and rounded, consisting of fourteen rays, which extend beyond the webs, making the edges appear scalloped.

The ventral fins like those of others of the genus: the dorsal fin consisted of fourteen strong spiny rays, and nineteen soft rays; the last of which were higher than the spiny rays.

The anal fin had twenty-one rays: the ends in every fin extending beyond their webs.

The tail was rounded at the end, and consisted of twelve rays, divided towards their extremities.

This fish in general was of a dusky hue, marked across with wavy lines: the belly of a light ash color.

The lower part of the pectoral fins, and the ends of the ventral fins, of an orange color.

** With a smooth head.

---

WE discovered this species in plenty lying under the stones among the tang on the rocky
Class IV. Smooth Blenny.

Rocky coasts of Anglesea, at the lower water-mark. It was very active and vivacious, and would by the help of its ventral fins creep up between the stones with great facility. It bit extremely hard, and would hang at one's finger for a considerable time. It was very tenacious of life, and would live for near a day out of water.

It feeds on shells and small crabs, whose remains we found in its stomach.

The length in general was five inches: the head large, and flopping suddenly to the mouth: the irides red.

The teeth slender, very sharp, and close set: there were twenty-four in the upper, and nineteen in the lower jaw.

The pectoral fins broad and rounded, consisting of thirteen rays: the ventral fins of only two thick rays, separated near their ends.

The dorsal fin consisted of thirty-two soft rays, and reached from the hind part of the head almost to the tail.

The vent was in the middle of the body: the anal fin extended almost to the tail, and consisted of nineteen rays, tipt with white.

The tail rounded at the end, and composed of twelve branched rays.

The color varied, some were quite black, but generally they were of a deep olive, prettily marbled with a deeper color; others spotted with white.

Vol. III.
SPOTTED BLENNY. CLASS IV.

the last often disposed in rows above and beneath the lateral line.

Blennius maculis circiter decem nigris limbo albicante utrinque ad pinnam dorfalem. Arted. synon. 45.
Blennius Gunnellus. B. pinna

THIS species is found in the same place with
the preceding, lurking like it under stones,
is equally vivacious, and is used as a bait for
larger fish.

Its length is six inches: the depth only half an
inch: the sides very much compressed, and ex-
remely thin.

The head and mouth is small; the last points
upwards, and the lower jaw slopes considerably to-
wars the throat.

The teeth are very small; the irides whitish.

The pectoral fins rounded, and of a yellow color:
instead of the ventral fins are two minute spines.

The dorsal fin consists of seventy-eight short spiny
rays, and runs the length of the back almost to the
tail: on the top of the back are eleven round spots,
Class IV. Viviparous Blenny.

which reach the lower half of the dorsal fin; they are black, half encircled with white.

The vent is in the middle of the body; the anal fin extends from it almost to the tail.

The tail is rounded, and of a yellow color.

The back and sides are of a deep olive: the belly whitish.

Muftela marina vivipara, Ael.-quappe, Ael-puet, Ael.-moder. Schoneveldt, 50.  
Tab. 4.  
III. 25.  
Muftela vivipara Schoneveldii.  
Wil. Itab. 122. Raii syn.  
pic. 69.  
Blennius capite dorfoque fusco flavefcente lituris nigris, pinna ani flava. Arted. synon. 45.  
443.  
Tab. 32.  
Enchelyopus corpore lituris variegato; pinna dorsi ad caudam finuata. Gronov.  
Zooph. No. 265.

SCHONEVELDE first discovered this species;  
Sir Robert Sibbald afterwards found it on the Scotch coasts; and Linnaeus has described it in his account of his Swedish Majesty's Museum.

They are viviparous, bringing forth two or three hundred young at a time. Their season of parturition is a little after the depth of winter. Before Midsummer they quit the bays and shores, and retire into the deep, where they are commonly tak-
VIVIPAROUS BLENNY. Class IV.

They are a very coarse fish, and eat only by the poor.

They are common in the mouth of the river Esk, at Whitby, Yorkshire; where they are taken frequently from off the bridge.

They sometimes grow to the length of a foot. Their form slender; their skin smooth and slippery. The teeth very minute and sharp: the upper lip thin and skinny.

The dorsal fin commences just behind the head, and joins with that of the tail; but near the tail, the rest are short, so as to form the appearance of a division. The pectoral fins rounded: the ventral consist of only four short rays: the anal extends far, and unites with the tail. The tail round.

The dorsal fin, back, and sides are of a yellowish brown, stained with dusky spots and lines. The end of the tongue, the chin, throat, and anal fin of a fine yellow.

The back-bone is green, as that of a sea-needle.
Sect. III. Thoracic Fish.

Eyes placed near each other.
Four branchioptegous rays.
Ventral fins united.


It is to this fish that Naturalists have given the synonym of *Kogios,* and *Gobio,* names of certain species mentioned by *Aristotle,* *Pliny,* and *Oppian.* The two first have not left any characters for us to distinguish them by; and *Oppian* at once shews that he never intended this kind, as he has placed it among those which are armed with a poisonous spine. *Aristotle* was acquainted with two species; one a sea fish that frequented the rocks, another that was gregarious, and an inha-

* Formed from *Gobius,* the generic name bestowed by Naturalists on these fish.
bitant of rivers, which last seems to have been our common gudgeon.

This species grows to the length of six inches: the body is soft, slippery, and of a slender form: the head is rather large; the cheeks inflated; the teeth small, and disposed in two rows: from the head to the first dorsal fin is a small fulcus.

The first dorsal fin consists of six rays; the second of fourteen; the pectoral fins of sixteen or seventeen, closely set together, and the middlemost the longest; the others on each side gradually shorter.

The ventral fins coalesce and form a sort of funnel, by which these fish affix themselves moveably to the rocks, for which reason they are called Rock-fish.

The tail is rounded at the end.

The color is brown, or deep olive, mixed with dark streaks, and spotted with black: the dorsal and anal fins are of a pale blue, the rays marked with minute black spots.
We saw several of this species taken last summer on our sandy shores in the shrimp nets.

The length of the largest was not three inches: the nose was blunt: the eyes large and prominent, standing far out of the head: the irides sapphariane; the head flat; the tongue large; teeth in both jaws.

The first dorsal fin consisted of six rays; the second of eleven, and placed at some distance from the other.

The ventral fins are united: the anal consist of eleven rays: the tail is even at the end.

The body is of a whitish color, obscurely spotted with ferruginous: the rays of the dorsal fins, and the tail, barred with the same color.
BULL HEAD.

XXII. BULL-HEAD.

Large flat head, armed with sharp spines.
Six branchio-stegous rays.

THIS species is very common in all our clear brooks; it lies almost always at the bottom, either on the gravel or under a stone: it deposits its spawn in a hole it forms in the gravel, and quits it with great reluctance. It feeds on water insects; and we found in the stomach of one the remains of the fresh water shrimp, the pulex aquatilis of Ray.

This fish seldom exceeds the length of three inches and an half: the head large, broad, flat, and thin at its circumference, being well adapted for insinuating itself under stones: on the middle part of the covers of the gills is a small crooked spine turning inwards.
Class IV. Armed Bull-Head.

The eyes are very small: the irides yellow: the teeth very minute, placed in the jaws and the roof of the mouth.

The body grows slender towards the tail, and is very smooth.

The first dorsal fin consists of six rays, the second of seventeen: the pectoral fins are round, and prettily scalloped at their edges, and are composed of thirteen rays; the ventral of only four; the anal of thirteen; the tail of twelve, and is rounded at the end.

The color of this fish is as disagreeable as its form, being dusky, mixed with a dirty yellow: the belly whitish.

Cataphractus, Stein-bicker, Miiller, Turfi-bull. Schonevelde, 30. Tab. 3.
Cottus cirris plurimis corpore octagono. Artd. synon. 77.

The pogge is very common on most of the British coasts.

It seldom exceeds five inches and an half in length, and even seldom arrives at that size.

The head is large, bony, and very rugged: the end of the nose is armed with four short upright spines:
FATHER-LASHER. CLASS IV.

Spines: on the throat are a number of short white beards.

The teeth are very minute, situated in the jaws.

The body is octagonal, and covered with a number of strong bony crufts, divided into several compartments, the ends of which project into a sharp point, and form several echinated lines along the back and sides from the head to the tail.

The first dorsal fin consists of six spiny rays: the second is placed just behind the first, and consists of seven soft rays.

The pectoral fins are broad and rounded, and are composed of fifteen rays.

THIS fish is not uncommon on the rocky coasts of this island: it lurks under stones, and will take a bait.

It does not grow to a large size, seldom exceeding (as far as we have seen in the specimens that are taken on our shores) eight or nine inches.
The head is very large, and has a most formid-able appearance, being armed with vast spines, which it can oppose to any enemy that attacks it, by swelling out its cheeks and gill covers to a large size.

*Et capitis duro nociturus Scorpios i.θα.*  
The hurtful Scorpion wounding with its head.

The nose, and space contiguous to the eyes, are furnished with short sharp spines: the covers of the gills are terminated by exceeding long ones, which are both strong and very sharp pointed.

The mouth is large: the jaws covered with rows of very small teeth: the roof of the mouth is furnished with a triangular spot of minute teeth.

The back is more elevated than that of others of this genus: the belly prominent: the side-line rough, the rest of the body very smooth, and grows slender towards the tail.

The first dorsal fin consists of eight spiny rays; the second of eleven high soft rays: the pectoral fins are large, and have sixteen; the ventral three; the anal eight: the tail is rounded at the end, and is composed of twelve bifurcated rays.

The color of the body is brown, or dusky and white marbled, and sometimes is found also stained with red: the fins and tail are transparent, sometimes clouded, but the rays barred regularly with brown: the belly is of a silvery white.

This kind is very frequent in the Newfoundland American seas,
feas, where it is called *Scolping*: it is also as common on the coast of Greenland in deep water near shore. It is a principal food of the natives, and the soup made of it is said to be agreeable as well as wholesome.
Body very deep, and compressed sideways.
Very long filaments issuing from the first dorsal fin.
Seven branchiostegous rays.

SUPERSTITION hath made the Doree rival to the Haddock, for the honor of having been the fish out of whose mouth St. Peter took the tribute-money, leaving on its sides those incontestible proofs of the identity of the fish, the marks of his finger and thumb.

It is rather difficult at this time to determine on which part to decide the dispute; for the Doree likewise affirms an origin of its spots of a similar nature, but of a much earlier date than the former. St. Christopher*, in wading through an arm of

* Belon, Rondel, also Aldrovand de pisc. 40. St. Christopher was of a Colossal stature, as is evident from his image in the church.
of the sea, having caught a fish of this kind *en pâs-
*</p>
</body>
</html>
LUNULATED GILT HEAD.

OPAH.

M. Griffith's del
Class IV. O P A H.

The first dorsal fin consists of ten strong spiny rays, with long filaments, reaching far beyond their ends; the second is placed near the tail, and consists of twenty-four soft rays, the middlemost of which are the longest.

The pectoral fins have fourteen rays, the ventral seven; the first spiny, the others soft: it has two anal fins; the first consists of four sharp spines, the second of twenty-two soft ones, and reaches very near the tail.

The tail is round at the end, and consists of fifteen branched rays.

The color of the sides is olive, varied with light blue and white, and while living is very resplendent, and as if gilt, for which reason it is called the Doree.

The largest fish we have heard of, weighed twelve pounds.


We have only five instances of this fish being taken in our seas, four of them in the North, viz. twice off Scotland*, once off Northumberland,

* The fish engraved by Sir Robert Sibbald, Hist. Scot. Tab. 6., and thus described, is of this kind. Pisces maculis aureis aspersus non scriptus, pollices 42 longus.
one in Filey-Bay, Yorkshire; and a fifth was caught at Brixham, in Torbay, in 1772.

The last weighed a hundred and forty pounds. The length was four feet and an half: the breadth two feet and a quarter: the greatest thickness, only four inches. Its general color was a vivid transparent scarlet varnish, over burnished gold, bespangled with oval silver spots of various sizes: the breast was an hard bone, resembling the keel of a ship: the flesh looked, and tasted like beef.

I find a more ample description of another, by Mr. Robert Harrison, of Newcastle.

Newcastle, Sept. 12. 1769; On Saturday last was thrown upon the sands at Blyth, a very rare and beautiful fish, weighing between seventy and eighty pounds, shaped like the sea bream. The length was three feet and an half; the breadth from back to belly almost two feet; but the thickness from side to side not above six inches.

The mouth small for the size of the fish, forming a square opening, and without any teeth in the jaws. The tongue thick, resembling that of a man, but rough and thick set with beards or prickles, pointing backwards, so that any thing might easily pass down, but could not easily return back, therefore these might serve instead of teeth to retain its prey. The eyes remarkably large, covered with a membrane, and shining with a glare of gold. The cover of the gills like the salmon.

† This description was sent to me by a gentleman, who saw the fish soon after it was taken.
The body diminishes very small to the tail, which is forked, and expands twelve inches: the gill fins are broad, about eight inches long, and play horizontally: a little behind their insertion the back fin takes its original, where it is about seven inches high, but slopes away very suddenly, running down very near the tail, and at its termination becomes a little broader: the belly fins are very strong, and placed near the middle of the body: a narrow fin also runs from the anus to the tail.

All the fins, and also the tail, are of a fine scarlet; but the colors and beauty of the rest of the body, which is smooth and covered with almost imperceptible scales, beggars all description; the upper part being a kind of bright green, variegated with whitish spots, and enriched with a shining golden hue, like the splendor of a peacock's feather. This by degrees, vanishes in a bright silver, and near the belly the gold again predominates in a lighter ground than on the back.
Body quite flat, and very thin.
Eyes, both on the same side the head.
Branchioptegous rays from four to seven.

* With the eyes on the right side.

**This** is the largest of the genus; some have been taken in our seas weighing from one to three hundred pounds; but much larger are found in those of Newfoundland, Greenland, and Iceland, where they are taken with a hook and line in very deep water. They are part of the food of the Greenlanders*, who cut them into large slips, and dry them in the sun.

They are common in the London markets, where they are exposed to sale cut into large pieces. They are very coarse eating, excepting the part

* Crantz. Hist. Greenl. I. 98. which
which adheres to the side fins, which is extremely fat and delicious, but surfeiting.

They are the most voracious of all flat fish. The last year there were two instances of their swallowing the lead weight at the end of a line, with which the seamen were sounding the bottom from on board a ship, one off Flamborough Head, the other going into Tinmouth Haven: the latter was taken, the other disengaged itself.

The holibut, in respect to its length, is the narrowest of any of this genus except the sole.

It is perfectly smooth, and free from spines either above or below. The color of the upper part is dusky; beneath of a pure white. We do not count the rays of the fins in this genus, not only because they are so numerous, but because nature hath given to each species characters sufficient to distinguish them by.

These flat fish swim sideway:; for which reason Linnaeus hath styled them Pleuronectes.
THESE fish are very common on most of our coasts, and sometimes taken of the weight of fifteen pounds; but they seldom reach that size, one of eight or nine pounds being reckoned a large fish.

The best and largest are taken off Rye, on the coast of Sussex, and also off the Dutch coasts. They spawn on the beginning of February.

They are very flat, and much more square than the preceding. Behind the left eye is a row of six tubercles, that reaches to the commencement of the lateral line.

The upper part of the body and fins is of a clear brown, marked with large bright orange-colored spots: the belly is white.
THE flounder inhabits every part of the British sea, and even frequents our rivers at a great distance from the salt waters; and for this reason some writers call it the Paffer fluvialis. It never grows large in our rivers, but is reckoned sweeter than those that live in the sea. It is inferior in size to the plaife, for we never heard of any that weighed more than six pounds.

It may very easily be distinguished from the plaife, or any other fish of this genus, by a row of sharp small spines that surround its upper sides, and are placed just at the junction of the fins with the body. Another row marks the side-line, and runs half way down the back.

The color of the upper part of the body is a pale brown, sometimes marked with a few obscure spots of dirty yellow. the belly is white.

We have met with a variety of this fish with the eyes and lateral line on the left side. Linnaeus makes a distinct species of it under the name of Q.3

Le Flez. Belon, 141.
Struff-butte Schonevelde, 62.
Flounder, Fluke, or But. Wil. Icth. 980. Rait syn.
pisc. 32.
Pleuronecles oculis a dextris, linea laterali aspera, spi-
nulis supiné ad radices pin- 104. Floun-

The flounder inhabits every part of the British sea, and even frequents our rivers at a great distance from the salt waters, and for this reason some writers call it the Paffer fluvialis. It never grows large in our rivers, but is reckoned sweeter than those that live in the sea. It is inferior in size to the plaice, for we never heard of any that weighed more than six pounds.

It may very easily be distinguished from the plaice, or any other fish of this genus, by a row of sharp small spines that surround its upper sides, and are placed just at the junction of the fins with the body. Another row marks the side-line, and runs half way down the back.

The color of the upper part of the body is a pale brown, sometimes marked with a few obscure spots of dirty yellow. the belly is white.

We have met with a variety of this fish with the eyes and lateral line on the left side. Linnaeus makes a distinct species of it under the name of Q.3

The flounder inhabits every part of the British sea, and even frequents our rivers at a great distance from the salt waters, and for this reason some writers call it the Passer fluvialis. It never grows large in our rivers, but is reckoned sweeter than those that live in the sea. It is inferior in size to the plaice, for we never heard of any that weighed more than six pounds.

It may very easily be distinguished from the plaice, or any other fish of this genus, by a row of sharp small spines that surround its upper sides, and are placed just at the junction of the fins with the body. Another row marks the side-line, and runs half way down the back.

The color of the upper part of the body is a pale brown, sometimes marked with a few obscure spots of dirty yellow. the belly is white.

We have met with a variety of this fish with the eyes and lateral line on the left side. Linnaeus makes a distinct species of it under the name of Q.3

The flounder inhabits every part of the British sea, and even frequents our rivers at a great distance from the salt waters, and for this reason some writers call it the Passe fluvialis. It never grows large in our rivers, but is reckoned sweeter than those that live in the sea. It is inferior in size to the plaice, for we never heard of any that weighed more than six pounds.

It may very easily be distinguished from the plaice, or any other fish of this genus, by a row of sharp small spines that surround its upper sides, and are placed just at the junction of the fins with the body. Another row marks the side-line, and runs half way down the back.

The color of the upper part of the body is a pale brown, sometimes marked with a few obscure spots of dirty yellow. the belly is white.

We have met with a variety of this fish with the eyes and lateral line on the left side. Linnaeus makes a distinct species of it under the name of Q.3
Pleuronectes Passer, p. 459; but since it differs in no other respect from the common kind, we agree with Doctor Gronovius in not separating them.


The dab is found with the other species, but is less common. It is in best season during February, March, and April: they spawn in May and June, and become flabby and watery the rest of summer. They are superior in goodness to the plaice and flounder, but far inferior in size.

Descrip. It is generally of an uniform brown color on the upper side, tho' sometimes clouded with a darker. The scales are small and rough, which is a character of this species. The lateral line is extremely incurvated at the beginning, then goes quite strait to the tail. The lower part of the body is white.

106. Smear-Dab. Rhombus lavis Cornubiensis maculis nigris, a Kit. Mr. Jago. Raiti syn. pisces. 162. fig. 1.

We found one of this species at a fishmonger's in London, where it is known by the name of the Smear-dab.
It was a foot and a half long, and eleven inches broad between fin and fin on the widest part.

The head appeared very small, as the dorsal fin began very near its mouth, and extended very near to the tail. It consisted of seventy nine rays.

The eyes were pretty near each other. The mouth full of small teeth.

The lateral line was much incurvated for the first two inches from its origin, then continued straight to the tail.

The back was covered with small smooth scales, was of a light brown color, spotted obscurely with yellow. The belly white, and marked with five large dusky spots.

It was a fish of goodness equal to the common dab.

La Sole. Belon, 142.
Tungen. Schonevalde, 63.
Pleuroneutes oculis a finiftra corpore oblongo, maxilla

superiore longiore, squamis utrinque aperis. Arted. syn.

107. Sole.

32.
Pleuroneetes Solea Lin. syft.


Suec. No. 326.

The sole is found on all our coasts, but those on the western shores are much superior in size to those of the north. On the former they are sometimes taken of the weight of six or seven pounds,
pounds, but towards Scarborough they rarely exceed one pound; if they reach two, it is extremely uncommon.

They are usually taken in the trawlnet: they keep much at the bottom, and feed on small shell fish.

**Descrip.**

It is of a form much more narrow and oblong than any other of the genus. The irides are yellow; the pupils of a bright sappharine color: the scales are small, and very rough: the upper part of the body is of a deep brown: the tip of one of the pectoral fins black: the under part of the body is white: the lateral line straight: the tail rounded at the end.

It is a fish of a very delicate flavour; but the small soles are much superior in goodness to large ones*. The chief fishery for them is at Brixham in Torbay.

Arnoglossus seu Solea lavis. Wil. Icth. 102. Ral. syn. pis. 34.

THIS, as described by Mr. Ray, (for we have not seen it) is extremely thin, pellucid, and

* By the antient laws of the Cinque ports, no one was to take soles from the 1st of November to the 15th of March; neither was any body to fish from sun setting to sun-rising, that the fish might enjoy their night-food.
white, and covered with such minute scales, and those instantly deciduous, as to merit the epi-
that smooth.

It is a scarce species, but is found in Cornwall, where, from its transparence, it is called the Lan-
tern Fish.

It is probable that Ovid intended this species, by his Solea; for the common kind does by no means
merit his description.

Fulgentes Soleae candore.

And Soles with white resplendent.

** With the eyes on the left side.

Steinbutt, Torbutt, Treen-
butt, Dornbutt. Schonevel-
de, 60.
Turbot, in the north a Bret.
Wil. Ictb. 94.
Rhombus maximus asper non

TURBOTS grow to a very large size; we
have seen them of three and twenty pounds
weight, but have heard of some that weighed
thirty. They are taken chiefly off the north coast of

England,
England, and others off the Dutch coast; but we believe the last has, in many instances, more credit than it deserves for the abundance of its fish.

The large Turbots, and several other kinds of flat fish, are taken by the hook and line, for they ly in deep water: the method of taking them in wares, or staked nets, is too precarious to be depended on for the supply of our great markets, because it is by mere accident that the great fish stray into them.

It is a misfortune to the inhabitants of many of our fishing coasts, especially those of the north part of North Wales, that they are unacquainted with the most successful means of capture: for their benefit, and perhaps that of other parts of our island, we shall lay before them the method praticed by the fishermen of Scarborough, as it was communicated to us by Mr. Travis.

When they go out to fish, each person is provided with three lines. Each man's lines are fairly coiled upon a flat oblong piece of wicker-work; the hooks being baited, and placed very regularly in the centre of the coil. Each line is furnished with 14 score of hooks, at the distance of six feet two inches from each other. The hooks are fastened to the lines upon sneads of twisted horse-hair, 27 inches in length.

When fishing there are always three men in each coble, and consequently nine of these lines are fastened together, and used as one line, extend-
ing in length near three miles, and furnished with 2520 hooks. An anchor and a buoy are fixed at the first end of the line, and one more of each at the end of each man's lines; in all four anchors, which are commonly perforated stones, and four buoys made of leather or cork. The line is always laid across the current. The tides of flood and ebb continue an equal time upon our coast, and when undisturbed by winds run each way about six hours. They are so rapid that the fishermen can only shoot and haul their lines at the turn of tide; and therefore the lines always remain upon the ground about six hours*. The same rapidity of tide prevents their using hand-lines; and therefore two of the people commonly wrap themselves in the sail, and sleep while the other keeps a strict look-out, for fear of being run down by ships, and to observe the weather. For storms often rise so suddenly, that it is with extreme difficulty they can sometimes escape to the shore, leaving their lines behind.

The coble is 20 feet 6 inches long, and 5 feet extreme breadth. It is about one ton burthen, rowed with three pair of oars, and admirably constructed for the purpose of encountering a mountainous sea: they hoist sail when the wind suits.

* In this space the *myxine glutinosa* of Linnaeus, will frequently penetrate the fish that are on the hooks, and entirely devour them, leaving only the skin and bones.

The
The five-men boat is 40 feet long and 15 broad, and of 25 tons burthen: it is so called, tho’ navigated by six men and a boy, because one of the men is commonly hired to cook, &c. and does not share in the profits with the other five. All our able fishermen go in these boats to the herring fishery at Yarmouth the latter end of September, and return about the middle of November. The boats are then laid up until the beginning of Lent, at which time they go off in them to the edge of the Dogger, and other places, to fish for turbot, cod, ling, skates, &c. They always take two cobs on board, and when they come upon their ground, anchor the boat, throw out the cobs, and fish in the same manner as those do who go from the shore in a coble; with this difference only, that here each man is provided with double the quantity of lines, and instead of waiting the return of tide in the coble, return to the boat and bait their other lines; thus hawling one set, and shooting another every turn of tide. They commonly run into harbour twice a week to deliver their fish. The five-men boat is decked at each end, but open in the middle, and has two large lug-fails.

Bait.

The best bait for all kinds of fish is fresh herring cut in pieces of a proper size; and notwithstanding what has been said to the contrary, they are taken here at any time in the winter, and all the spring, whenever the fishermen put down their nets for that purpose. The five-men boats always take some
some nets for that end. Next to herrings are the lesser lampreys *, which come all winter by land-carriage from Tadcaster. The next baits in esteem are small hadocks cut in pieces, sand worms, muscles, and limpets (called here Flidders;) and lastly, when none of these can be had they use bullock's liver. The hooks used here are much smaller than those employed at Iceland and Newfoundland. Experience has shewn that the larger fish will take a living small one upon the hook, sooner than any bait that can be put on; therefore they use such as the small fish can swallow. The hooks are two inches and an half long in the shank, near an inch wide between the shank and the point. The line is made of small cording, and is always tanned before it is used.

Turbots, and all the rays, are extremely delicate in their choice of baits. If a piece of herring or hadock has been twelve hours out of the sea, and then used as bait, they will not touch it.

This and the pearl are of a remarkable square form: the color of the upper part of the body is cinereous, marked with numbers of black spots of different sizes: the belly is white: the skin is without scales, but greatly wrinkled, and mixed with small short spines, dispersed without any order.

* The Dutch also use these fish as baits in the turbot fishery, and purchase annually from the Thames fishermen as much as amounts to 700£, worth, for that purpose.

It is frequently found in the London markets, but is inferior to the turbot in goodness as well as size.

The irides are yellow: the skin is covered with small scales, but is quite free from any spines or inequalities.

The upper side of the body is of a deep brown, marked with spots of dirty yellow: the under side is of a pure white.

III. Whiff. Passer Cornubienfis asper, magno oris hiatu. Mr. Jago. Rall syn. pis. 163. fig. 2.

This bears some resemblance to the Holibut. One was brought to me by my fisherman, October 31, 1775. Its length was eighteen inches: the greatest breadth not seven, exclusive of the fins.

The
Class IV. WHIFF.

The mouth extremely large: teeth very small: the under jaw hooks over the upper: the eyes large; and placed on the side.

The scales great, and rough: the side-line uncommonly incurvated at the beginning. After making a sharp angle, goes strait to the tail, and is tuberculated: the tail is rounded.

The color of the upper part of the body is cinereous brown, clouded in parts, and obscurely spotted: the under side white, tinged with red.
Covers of the gills scaly.
Five branchiostegous rays.
Fore teeth sharp.
Grinders flat.
One dorsal fin, reaching the whole length of the back.
Forked tail.

THIS is one of the pisces saxatiles, or fish that haunt deep waters on bold rocky shores: those that form this genus, as well as the following, feed chiefly on shell fish, which they comminute with their teeth before they swallow; the teeth of this genus in particular being extremely well adapted for that purpose, the grinders being flat and strong, like those of certain quadrupeds: besides those are certain bones in the lower part of the mouth, which assist in grinding their food.

They
Class IV. G I L T - H E A D.

They are but a coarse fish; nor did the Romans hold them in any esteem, except they had fed on the Lucrine oyster.

*Non omnis laudem pretiumque Aurata meretur,
Sed cui folus erit coucha Lucrina cibus.*

No praise, no price a Gilt-head e'er will take,
Unfed with oysters of the Lucrine lake.

They grow to the weight of ten pounds: the form of the body is deep, not unlike that of a bream: the back is very sharp, and of a dusky green color: the irides of a silvery hue: between the eyes is a semilunar gold colored spot, the horns of which point towards the head: on the upper part of the gills is a black spot, beneath that another of purple.

The dorsal fin extends almost the whole length of the back, and consists of twenty-four rays, the eleven first spiny, the others soft: the pectoral fins consist of seventeen soft rays; the ventral of six rays, the first of which is very strong and spiny: the anal fin of fourteen; the three first spiny.

The tail is much forked.

It takes its name from its predominant color; that of the forehead and sides being as if gilt, but the last is tinged with brown.

THIS species grows to a size equal with that of the former: its shape and the figure of the teeth are much the same.

The irides are silvery: the inside of the covers of the gills, the mouth, and the tongue, are of a fine red.

At the base of the pectoral fins is a ferruginous spot.

What is peculiar to this species is, that the skin at the end of the dorsal and anal fins is gathered up, and hides the last rays.

The scales are large: the tail forked.

The color of the whole body is red.
**Class IV. TOOTHED GILT-HEAD.**


This species was communicated to Mr. Ray by his friend Mr. *Jonston,* a Yorkshire gentleman, who informed him it was found on the sands near the mouth of the *Tees,* Sept. 18, 1681.

It was a deep fish, formed like a roch, twenty-six inches long, ten broad, and grew very slender towards the tail.

The eyes large, like those of quadrupeds. In the lower jaws were two rows of teeth, slender and sharp as needles; and on each side a slender canine tooth: in the upper only a single row of teeth. The aperture of the gills very large. The body scaly.

In the middle of the back was one fin extending almost to the tail; the seven first rays high, the rest low: behind the vent is another, corresponding: both are entirely covered with scales flated over each other.

The back black; the sides of a brighter color; the belly quite of a silvery brightness.
XXVI. Wrasse.

Covers of the gills scaly.

Branchioptegous rays unequal in number.*

Teeth conic, long and blunt at their ends. One tuberculated bone in the bottom of the throat: two above opposite to the other.

One dorsal fin reaching the whole length of the back: a slender skin extending beyond the end of each ray.

Rounded tail.

THIS species is found in deep water adjacent to the rocks. It will take a bait, though its usual food is shell-fish, and small crustacea.

* Linnaeus says fix: this species had only four; the second, six; the third and fourth, five. We also find the same variation in the rays of the fins, the numbers being different in fish of the same species, not only of this but of other genera.
Class IV. WRASSE.

It grows to the weight of four or five pounds: it bears some resemblance to a carp in the form of the body, and is covered with large scales.

The nose projects; the lips are large and fleshy, and the one turns up, the other hangs down: the mouth is capable of being drawn in or protruded.

The irides are red: the teeth are disposed in two rows; the first are conic, the second very minute, and as if supporters to the others: in the throat just before the gullet are three bones, two above of an oblong form, and one below of a triangular shape; the surface of each rising into roundish protruberances: these are of singular use to the fish, to grind its shelly food before it arrives at the stomach.

The dorsal fin consists of sixteen sharp and spiny rays, and nine soft ones, which are much longer than the others.

The pectoral fins large and round, and are composed of fifteen rays.

The ventral of six; the first sharp and strong: the anal of three sharp spines, and nine flexible.

The tail is rounded at the end, and is formed of fourteen soft branching rays.

The lateral line much incurvated near the tail.

These fish vary infinitely in color: we have seen them of a dirty red, mixed with a certain duskyness; others most beautifully striped, especially about the
the head, with the richest colors, such as blue, red, and yellow. Most of this genus are subject to vary; therefore care must be taken not to multiply the species from these accidental tints, but to attend to the form which never alters.

The Welsh call this fish Gwrach, or the old woman; the French, la Vieille; and the English give it the name of Old Wife.

THIS is a kind of Wrasse, sent from Scarborough by Mr. Travis, differing from the other species. They appear during summer in great shoals off Filey-Bridge: the largest weigh about five pounds.

It was of the form of the common wrasse, only between the dorsal fin and the tail was a considerable sinking: above the nose was a deep fulcus: on the farthest cover of the gills was a depression radiated from the center.

It had only four branchiostegous rays.

The dorsal fin had thirty-one rays, twenty spiny, eleven soft; the last branched, and much longer than the spiny rays.

The pectoral fins had fourteen; the ventral six; the first of which was short and spiny; the anal twelve; the three first spiny, the nine others branched and soft.
Class IV. BIMACULATED WRASSE.

The tail was rounded at the end; at the bottom, for about a third part of the way, between each ray was a row of scales.

The color in general was yellow, spotted with orange.

Labrus bimaculata. L. pinna
dorfa! ramentacea, macula
fusca in lateiore medio, et
ad caudam. Lin. fig. 477.


Mr. Brunnich observed this species at Penzance, and referred me to Linnaeus's description of it in the Museum Ad. Fred. where it is described under the name of Sciæa Bimaculata.

The body is pretty deep, and of a light color, marked in the middle on each side with a round brown spot; on the upper part of the base of the tail is another: the lateral line is incurvated.

The branchioftegous rays are six in number*: the first fifteen rays of the dorsal fin are spiny; the

* Linnaeus, in his last edition, has removed this species from the genus of Sciæa, to that of Labrus, though it does not agree with the last in his number of branchioftegous rays.
TRIMACULATED WRASSE. Class IV.

other eleven soft, and lengthened by a skinny appendage: the pectoral fins consist of fifteen rays; the ventral of six; the first spiny; the second and third ending in a slender bristle: the anal fin is pointed; the four first rays being short and spiny; the rest long and soft.

The species we examined was taken on the coast of Anglesea; its length was eight inches.

It was of an oblong form; the nose long; the teeth slender; the fore teeth much longer than the others.

The eyes large: branchioptegous rays, five.

The back fin consisting of seventeen spiny rays, and thirteen soft ones; beyond each extended a long nerve.

The pectoral fins were round, and consisted of fifteen branched rays.

The ventral fins consisted of six rays; the first spiny.

The anal fin of twelve; the three first short, very strong, and spiny; the others soft and branched.

The tail was rounded.

The lateral line was straight at the beginning of the back, but grew incurvated towards the tail. The
STRIPED Wrasse.
The body covered with large red scales; the covers of the gills with small ones.

On each side of the lower part of the back fin were two large spots, and between the fin and the tail another.

This was taken off the Skerry Isles, on the coast of Anglesea; its length was ten inches.

The form was oblong, but the beginning of the back a little arched: the lips large, double, and much turned up: the teeth like those of the preceding: branchiostegous rays, five.

The number of rays in the back, pectoral, and ventral fins, the same as in those of the former.

In the anal fin were fifteen rays; the three first strong and spiny.

The tail almost even at the end, being very little rounded: the covers of the gills cinereous, striped with fine yellow.

The sides marked with four parallel lines of greenish olive, and the same of most elegant blue.

The back and belly red; but the last of a much paler hue, and under the throat almost yellow.

Along the beginning of the back fin was a broad bed of rich blue; the middle part white; the rest red.
GIBBOUS W R A S S E. Class IV.

At the base of the pectoral fins was a dark olive spot.

The ends of the anal fin, and ventral fins, a fine blue.

The upper half of the tail blue; the lower part of its rays yellow.

120. GibboS.

This species was taken off Anglesea: its length was eight inches; the greatest depth three: it was of a very deep and elevated form, the back being vastly arched, and very sharp or ridged.

From the beginning of the head to the nose, was a steep declivity.

The teeth like those of the others.

The eyes of a middling size; above each a dusky semilunar spot.

The nearest cover of the gills finely serrated.

The sixteen first rays of the back strong and spiny; the other nine soft and branched.

The pectoral fins consisted of thirteen, the ventral of six rays; the first ray of the ventral fin was strong and sharp.

The anal fin consisted of fourteen rays, of which the three first were strongly aculeated.

The tail was large, rounded at the end, and the rays
Class IV. GOLD SinNY.

rays branched; the ends of the rays extending beyond the webs.

The lateral line was incurvated towards the tail.

The gill covers and body covered with large scales.

The first were most elegantly spotted, and striped with blue and orange, and the sides spotted in the same manner; but nearest the back the orange was disposed in stripes: the back fin and anal fin were of a sea green, spotted with black.

The ventral fins and tail a fine pea green.

The pectoral fins yellow, marked at their base with transverse stripes of red.

**Color.**

fig. 3.

This and the two following species were discovered by Mr. Jago on the coast of Cornwall: we never had an opportunity of examining them, therefore are obliged to have recourse to his descriptions, retaining their local names.

In the whole form of the body, lips, teeth, and fins, it resembles the *Wrasse*: it is said never to exceed a palm in length: near the tail is a remarkable
able black spot: the first rays of the dorsal fin are tinged with black.

The *Melanurus* of *Rondeletius* (adds he) takes its name from the black spot near the tail; but in many instances it differs widely from this species, the tail of the first is forked, that of the *Goldfinny* is even at the end.

I suspect that this species was sent to me from *Cornwal*. Besides the spot near the tail, there was another near the vent.

In the dorsal fin were sixteen spiny, and nine soft rays: in the pectoral fourteen: in the anal three spiny, eleven soft: in the ventral six. The tail almost even at the end.

**RECEIVED** this species from *Cornwal*, and suppose it to be the *Comber* of Mr. *Jago*.

It was of a slender form. The dorsal fin had twenty spiny, eleven soft rays: the pectoral fourteen: the ventral five: the anal three spiny, seven soft. The tail round.

The color of the back, fins, and tail, red: the belly yellow: beneath the lateral line ran parallel a smooth,
Class IV. Cook

A smooth, even stripe from gills to tail, of a silvery color.

Cook (i.e. Coquus) Cornubiensium, Rayi, syn. pis. 163. 123. Cook, fig. 4.

This species, Mr. Jago says, is sometimes taken in great plenty on the Cornish coasts. It is a scaly fish, and does not grow to any great size. The back is purple and dark blue; the belly yellow. By the figure it seems of the same shape as the Comber, and the tail rounded.

Besides these species we recollect seeing taken at the Giant's Causeway in Ireland, a most beautiful kind of a vivid green, spotted with scarlet; and others at Bandooran, in the county of Sligo, of a pale green. We were at that time inattentive to this branch of natural history, and can only say they were of a species we have never since seen.
254 PERCH. Class IV.

The edges of the gill-covers ferrated.
Seven branchioptegous rays.
Body covered with rough scales.
First dorsal fin spiny; the second soft *.

The perch of Aristotle and Aufonius is the same with that of the moderns. That mentioned by Oppian, Pliny, and Athenaeus †, is a sea-fish probably of the Labrus or Sparus kind, being enumerated by them among some congeneric-

* The Ruffe is an exception, having only one dorsal fin, but the fourteen first rays of it are spiny.


rous
Class IV. PERCH.

rous species. Our perch was much esteemed by the Romans:


It is not less admired at present as a firm and delicate fish; and the Dutch are particularly fond of it when made into a dish called Water Souchy.

It is a gregarious fish, and loves deep holes and gentle streams. It is a most voracious fish, and eager biter: if the angler meets with a shoal of them, he is sure of taking every one.

It is a common notion that the pike will not attack this fish, being fearful of the spiny fins which the perch erects on the approach of the former. This may be true in respect to large fish; but it is well known the small ones are the most tempting bait that can be laid for the pike.

The perch is a fish very tenacious of life: we have known them carried near sixty miles in dry straw, and yet survive the journey.

These fish seldom grow to a large size: we once heard of one that was taken in the Serpentine river, Hyde-Park, that weighed nine pounds, but that it is very uncommon.

The body is deep: the scales very rough: the back much arched: side-line near the back.

The irides golden: the teeth small, disposed in the jaws and on the roof of the mouth: the edges of
of the covers of the gills ferrated: on the lower end of the largest is a sharp spine.

The first dorsal fin consists of fourteen strong spiny rays: the second of sixteen soft ones: the pectoral fins are transparent, and consist of fourteen rays; the ventral of six; the anal of eleven.

The tail is a little forked.

**Color.**

The colors are beautiful: the back and part of the sides being of a deep green, marked with five broad black bars pointing downwards: the belly is white, tinged with red: the ventral fins of a rich scarlet; the anal fins and tail of the same color, but rather paler.

In a lake called *Llyn Raitblyn,* in *Merionethshire,* is a very singular variety of perch: the back is quite hunched, and the lower part of the back bone, next the tail, strangely distorted: in color, and in other respects, it resembles the common kind, which are as numerous in the lake as these deformed fish. They are not peculiar to this water, for *Linnaeus* takes notice of a similar variety found at *Fablun,* in his own country. I have also heard that it is to be met with in the *Thames* near *Marlow.*
The baffe is a strong, active, and voracious fish: Ovid calls them *rapidi lupi*, a name continued to them by after-writers.

That which we had an opportunity of examining was small; but they are said to grow to the weight of fifteen pounds.

The irides are silvery: the mouth large: the teeth are situated in the jaws, and are very small: in the roof of the mouth is a triangular rough space, and just at the gullet are two others of a roundish form.

The scales are of a middling size, are very thick set, and adhere closely.

The first dorsal fin has nine strong spiny rays, of which the first is the shortest, the middlemost the highest; the second dorsal fin consists of thirteen rays, the first spiny, the others soft.

The pectoral fins have fifteen soft rays; the ventral six rays, the first spiny: the anal fourteen rays, the three first spiny, the others soft: the tail is a little forked.
The body is formed somewhat like that of a salmon.

The color of the back is dusky, tinged with blue. The belly white. In young fish the space above the side line is marked with small black spots.

It is esteemed a very delicate fish.

THIS species is about a foot long: the head large and deformed: eyes great: teeth small and numerous. On the head and covers of the gills are strong spines. The dorsal fin is furnished with fifteen strong spiny rays, and fourteen soft: the pectoral with eighteen: the ventral with one spiny, and five soft: the anal with three spiny, and eight soft: the tail, even at the end: the lateral line parallel to the back. The color red, with a black spot on the covers of the gills, and some transverse dusky lines on the sides.

It is a fish held in some esteem at the table.
Percae fluviatilis genus minus. falibus unitis radiis 27.
Gefuer píc. 701. spinis 15. cauda bifida.
Ruffe. Raii syu. pís. 143. píc. 37. Tab. II. Wulff
Perca dorfo monopterygio, ca- Borufs. No. 35.
pite cavernofo. Arted. syu. 68.

THIS fish is found in several of the English streams: it is gregarious, assembling in large shoals, and keeping in the deepest part of the water.

It is of a much more slender form than the perch, and seldom exceeds six inches in length.

The teeth are very small, and disposed in rows.

It has only one dorsal fin extending along the greatest part of the back: the first rays, like those of the perch, are strong, sharp, and spiny; the others soft.

The pectoral fins consist of fifteen rays; the ventral of six; the anal of eight; the two first strong and spiny: the tail a little bifurcated.

The body is covered with rough compact scales.

The back and sides are of a dirty green, the last inclining to yellow, but both spotted with black.

The dorsal fin is spotted with black: the tail marked with transverse bars.
Mr. Jago has left so brief a description of this fish, that we find difficulty in giving it a proper class: it agrees with the Ruffe in the form of the body, and the smallness of the teeth, in having a single extensive fin on the back, a forked tail, and being of that section of bony fish, termed Thoracic: these appear by the figure, the teeth excepted. The other characters must be borrowed from the description.

"It is smooth, with very small thin scales, fifteen inches long, three quarters of an inch broad; head and nose like a peal or trout; little mouth; very small teeth, beginning from the nose four inches and three quarters, near six inches long; a forked tail; a large double nostril. Two taken at Loo, May 26, 1721, in the Sean, near the shore, in sandy ground with small ore weed."
Class IV. THREE SPINED S. BACK.

Three branchioosteogous rays.
The belly covered with bony plates.
One dorsal fin, with several sharp spines between it and the head.

La Grande Espinoche, un Epinard, une Artiere. Belon, 528.
Stickelback, Banfickle, or Sharpling. Wil. Ichth. 341.
Gaeteroalues aculeis in dorso tribus. Arted. synon. 80.

These are common in many of our rivers, but no where in greater quantities than in the Fens of Lincolnshire, and some of the rivers that creep out of them. At Spalding there are, once in seven or eight years, amazing shoals that appear in the Welland, and come up the river in form of a vast column. They are supposed to be the multitudes that have been washed out of the fens by the floods of several years, and collected in some deep hole, till overcharged with numbers, they are periodically obliged to attempt a change of place. The quantity is so great, that they are used to manure the land, and trials have been made
to get oil from them. A notion may be had of this vast shoal, by saying that a man employed by the farmer to take them, has got for a considerable time four shillings a day by selling them at a half-penny per bushel.

This species seldom reaches the length of two inches: the eyes are large: the belly prominent: the body near the tail square: the sides are covered with large bony plates, placed transversely.

On the back are three sharp spines, that can be raised or depressed at pleasure: the dorsal fin is placed near the tail: the pectoral fins are broad: the ventral fins consist each of one spine, or rather plate, of unequal lengths, one being large, the other small; between both is a flat bony plate, reaching almost to the vent: beneath the vent is a short spine, and then succeeds the anal fin.

The tail consists of twelve rays, and is even at the end.

The color of the back and sides is an olive green; the belly white; but in some the lower jaws and belly are of a bright crimson.

130. Ten Spined.

La petite Espinoche. Belon, 328.
Piéciuli aculeati alterum genus. Rondel, fluviat. 206.
Geßner pisc. 8.

Gasterosteus aculeis in dorso decem. Arted. synon. 80.
Benunge, Gaddfùr, Gorquad.

THIS species is much smaller than the former, and of a more slender make.

The
Class IV. FIFTEEN SPINED S. BACK.

The back is armed with ten short sharp spines, which do not incline the same way, but cross each other.

The sides are smooth, not plated like those of the preceding: in other particulars it resembles the former.

The color of the back is olive: the belly silvery.

Aculeatus, five Pungitius marinus longus, Stein-bicker, Erskruper. Schonevelde, 10. syn. pisce 145.
338.

THIS species inhabits the sea, and is never found in fresh water.

Its length is above six inches: the nose is long and slender: the mouth tubular: teeth small.

The fore part of the body is covered on each side with a row of bony plates, forming a ridge; the body afterwards grows very slender, and is quadrangular.

Between the head and the dorsal fin are fifteen small spines: the dorsal fin is placed opposite the anal fin: the ventral fins are wanting.

The tail is even at the end.

The color of the upper part is a deep brown: the belly white.

S 4    Seven
The mackerel is a summer fish of passage that visits our shores in vast shoals. It is less useful than other species of gregarious fish, being very tender, and unfit for carriage; not but that it may be preserved by pickling and salting, a method, we believe, practised only in Cornwall, where it proves a great relief to the poor during winter.

It was a fish greatly esteemed by the Romans,

This is the first opportunity we have had of looking into Salvianus, whose Italian synonyms we make use of.

† Borlase Cornwall, 269.
because it furnished the precious Garum, a sort of pickle that gave a high relish to their sauces, and was besides used medicinally. It was drawn from different kinds of fish, but that made from the mackerel had the preference: the best was made at Carthagena, vast quantities of mackerel being taken near an adjacent isle, called from that circumstance, Scombraria*; and the Garum, prepared by a certain company in that city, bore a high price, and was distinguished by the title of Garum Sociorum †.

This fish is easily taken by a bait, but the best time is during a fresh gale of wind, which is thence called a mackerel gale.

In the spring the eyes of mackerel are almost covered with a white film; during which period they are half blind. This film grows in winter, and is cast the beginning of summer.

It is not often that it exceeds two pounds in weight, yet we heard that there was one fold last summer in London that weighed five and a quarter.

The nose is taper and sharp-pointed: the eyes large: the jaws of an equal length: the teeth small, but numerous.

The form of this fish is very elegant.

The body is a little compressed on the sides: towards the tail it grows very slender, and a little angular.

* Strabo Lib. III. 109.
† Plinii Lib. XXXI. c. 8.

The
The first dorsal fin is placed a little behind the pectoral fin, is triangular, and consists of nine or ten stiff rays; the second lies at a distance from the other, and has twelve soft rays; the pectoral twenty; the ventral six: at the base of the anal fin is a strong spine.

Between the last dorsal fin and the tail, are five finall fins, and the same number between the anal fin and the tail.

Color.

The tail is broad and semilunar: the color of the back and sides above the lateral line, is a fine green, varied with blue, marked with black lines, pointing downwards; beneath the line the sides and belly are of a silvery color.

It is a most beautiful fish when alive; for nothing can equal the brilliancy of its color, which death impairs, but does not wholly obliterate.


THE tunny was a fish well known to the antients, it made a considerable branch of commerce;
merce; the time of its arrival into the Mediterranean from the ocean was observed, and stations for taking them established in places it most frequented; the eminencies above the fishery were styled ὤννοσκοτεῖα*, and the watchmen that gave notice to those below of the motions of the fish, ὤννοσκόται †. From one of the former the lover in Theocritus threatened to take a desperate leap, on account of his mistress’s cruelty.

Do you not hear? then, rue your Goat-herd’s fate,
For, from the rock where Olpis doth defcry
The numerous Thunny, I will plunge and die.

The very same station, in all probability, is at this time made use of, as there are very considerable thunny fisheries on the coast of Sicily, as well as several other parts of the Mediterranean‡; where they are cured, and make a great article of provision in the adjacent kingdoms. They are caught

* Strabo Lib. V. 156.
† Oppian Halieut. III. 638. This person answers to what the Cornish call a Huer, who watches the arrival of the pilchards.
‡ Many of them are the same that were used by the antients, as we learn from Oppian and others.
in nets, and amazing quantities are taken, for they come in vast shoals, keeping along the shores.

They frequent our coasts, but not in shoals like the Tunneys of the Mediterranean. They are not uncommon in the Lochs on the western coast of Scotland; where they come in pursuit of herrings; and, often during night, strike into the nets, and do considerable damage. When the fishermen draw them up in the morning, the Tunny rises at the same time towards the surface, ready to catch the fish that drop out. On perceiving it, a strong hook baited with a herring, and fastened to a rope, is instantly flung out, which the Tunny seldom fails to take. As soon as hooked, it loses all spirit; and after a very little resistance, submits to its fate. It is dragged to the shore and cut up, either to be sold fresh to people who carry it to the country markets, or is preserved salted in large casks.

The pieces, when fresh, look exactly like raw beef; but when boiled turn pale, and have something of the flavor of salmon.

One, which was taken when I was at Inveraray in 1769, and was weighed for my information, weighed 460 pounds.

The fish, I examined, was seven feet ten inches long: the greatest circumference five feet seven; the left near the tail one foot six. The body was round and thick, and grew suddenly very slender towards the tail; and near that part was angular.

The
The irides were of a pale green: the teeth very minute.

The first dorfal fin consisted of thirteen strong spines; which, when depressed, were so concealed in a deep slit in the back, as to be quite invisible till very closely inspected. Immediately behind this fin was another, tall and falciform: almost opposite to it, was the anal fin, of the same form. The spurious fins were of a rich yellow color: of these there were eleven above, and ten below.

The tail was in form of a crescent; and two feet seven inches between tip and tip.

The skin on the back was smooth, very thick, and black. On the belly the scales were visible. The color of the sides and belly silvery, tinged with caerulean and pale purple: near the tail marbled with grey.

They are known on the coast of Scotland by the name of Mackrelsture: Mackrel, from being of that genus; and sture, from the Danish, stor, great.

---

**Class IV. S C A D.**

The hides were of a pale green: the teeth very minute.

The first dorfal fin consisted of thirteen strong spines; which, when depressed, were so concealed in a deep slit in the back, as to be quite invisible till very closely inspected. Immediately behind this fin was another, tall and falciform: almost opposite to it, was the anal fin, of the same form. The spurious fins were of a rich yellow color: of these there were eleven above, and ten below.

The tail was in form of a crescent; and two feet seven inches between tip and tip.

The skin on the back was smooth, very thick, and black. On the belly the scales were visible. The color of the sides and belly silvery, tinged with caerulean and pale purple: near the tail marbled with grey.

They are known on the coast of Scotland by the name of Mackrelsture: Mackrel, from being of that genus; and sture, from the Danish, stor, great.

---

**Class IV. S C A D.**

The irides were of a pale green: the teeth very minute.

The first dorfal fin consisted of thirteen strong spines; which, when depressed, were so concealed in a deep slit in the back, as to be quite invisible till very closely inspected. Immediately behind this fin was another, tall and falciform: almost opposite to it, was the anal fin, of the same form. The spurious fins were of a rich yellow color: of these there were eleven above, and ten below.

The tail was in form of a crescent; and two feet seven inches between tip and tip.

The skin on the back was smooth, very thick, and black. On the belly the scales were visible. The color of the sides and belly silvery, tinged with caerulean and pale purple: near the tail marbled with grey.

They are known on the coast of Scotland by the name of Mackrelsture: Mackrel, from being of that genus; and sture, from the Danish, stor, great.

---

**Class IV. S C A D.**

The irides were of a pale green: the teeth very minute.

The first dorfal fin consisted of thirteen strong spines; which, when depressed, were so concealed in a deep slit in the back, as to be quite invisible till very closely inspected. Immediately behind this fin was another, tall and falciform: almost opposite to it, was the anal fin, of the same form. The spurious fins were of a rich yellow color: of these there were eleven above, and ten below.

The tail was in form of a crescent; and two feet seven inches between tip and tip.

The skin on the back was smooth, very thick, and black. On the belly the scales were visible. The color of the sides and belly silvery, tinged with caerulean and pale purple: near the tail marbled with grey.

They are known on the coast of Scotland by the name of Mackrelsture: Mackrel, from being of that genus; and sture, from the Danish, stor, great.
the irides silvery: the lower jaw a little longer than the upper: the edges of the jaws were rough, but without teeth.

On the upper part of the covers of the gills was a large black spot.

The scales were large and very thin: the lower half of the body quadrangular, and marked each side with a row of thick strong scales, prominent in the middle, extending to the tail.

The first dorsal fin consisted of eight strong spines: the second lay just behind it, and consisted of thirty-four soft rays, and reached almost to the tail. The pectoral fins narrow and long, and composed of twenty rays: the ventral of six branched rays.

The vent was in the middle of the belly; the anal fin extended from it to the tail, which was greatly forked.

The head and upper part of the body varied with green and blue: the belly silvery.

This fish was taken in the month of October; was very firm and well tasted, having the flavor of mackrel.
Head compressed, steep, and covered with scales.
Two branchioptegous rays.
Body covered with large scales, easily dropping off.

**Class IV. Red Surmullet.**

THIS fish was highly esteemed by the Romans, and bore an exceeding high price. The capricious epicures of Horace's* days, valued it in proportion to its size; not that the larger were more delicious, but that they were more difficult to be got. The price that was given for one in the time of Juvenal, and Pliny, is a striking evidence of the luxury and extravagance of the age:

Mullum sex millibus emit
Æquantem sane paribus foxtertia libris†.

* Sat. Lib. II. s. II. 33.
† Juvenal Sat. IV. 481. Ss. 9.d.

The
The lavish slave
Six thousand pieces for a Mullet gave,
A pence for each pound.

But *Asinius Celer*, a man of consular dignity, gave a still more unconscionable sum, for he did not scruple bestowing eight thousand nummi, or sixty-four pounds eleven shillings and eight-pence, for a fish of so small a size as the mullet; for according to Horace, a *Mullus trilobris*, or one of three pounds, was a great rarity; so that Juvenal's spark must have had a great bargain in comparison of what Celer had.

But Seneca says that it was not worth a farthing, except it died in the very hand of your guest: that such was the luxury of the times, that there were stews even in the eating rooms, so that the fish could at once be brought from under the table, and placed on it: that they put the mullets in transparent vases, that they might be entertained with the various changes of its rich color while it lay expiring†. *Apicius*‡, a wonderful genius

*Plin. Lib. IX. c. 17.


‡ *Ad omne luxus ingenium mirus*.
for luxurious inventions, first hit upon the method of suffocating them in the exquisite Carthaginian * pickle, and afterwards procured a rich sauce from their livers. This is the same gentleman whom Pliny, in another place, honors with the title of Nepotum omnium altissimus gurges †, an expression too forcible to be rendered in our language.

We have heard of this species being taken on the coast of Scotland, but had no opportunity of examining it; and whether it is found in the west of England with the other species, or variety, we are not at this time informed. Salvianus makes it a distinct species, and says, that it is of a purple color, striped with golden lines, and that it did not commonly exceed a palm in length: no wonder then that such a prodigy as one of six pounds should so captivate the fancy of the Roman epicure.

Mr. Ray establishes some other distinctions, such as the first dorsal fin having nine rays, and the color of that fin, the tail, and the pectoral fins, being of a very pale purple.

On these authorities we form different species of these fish, having only examined what Salvianus and Mr. Ray call the Mullus major, which we describe under the title of

* Garum Sociorum, vide p. 222.
† Lib. X. c. 48.
Mullus major. Salvian. 236. utrinoque quatuor luteis,
Mullus major nofter et Salviani. 95. longitudinalibus, parallelis.
Raii Syn. pif. 91. luteis longitudinalibus. Lin. f87. 496.
Trigla capite glabro, lineis

This species was communicated to us by Mr. Pitfield of Exeter: its weight was two pounds and an half; its length was fourteen inches; the thickest circumference eleven. It appears on the coast of Devonshire in May, and retires about November.

The head steep: the nose blunt: the body thick: the mouth small: the lower jaw furnished with very small teeth: in the roof of the mouth is a rough hard space: at the entrance of the gullet above is a single bone, and beneath are a pair, each with echinated surfaces, that help to comminute the food before it passes down.

From the chin hung two beards, two inches and a half long.

The eyes large: the irides purple: the head and covers of the gills very scaly.

The first dorsal fin was lodged in a deep furrow, and consisted of six strong, but flexible rays; the second of eight; the pectoral fins of sixteen; the ventral of six branched rays; the anal of seven: the tail is much forked.
The body very thick, and covered with large scales; beneath them the color was a most beautiful rosy red*; the changes of which, under the thin scales, gave that entertainment to the Roman epicures as above mentioned: the scales on the back and sides were of a dirty orange; those on the nose a bright yellow: the tail a reddish yellow.

The sides were marked lengthways with two lines of a light yellow color: these, with the red color of the dorsal fins, and the number of their rays, Mr. Ray makes the character of the Cornish Surmullet: these are notes so liable to vary by accident, that till we receive further information from the inhabitants of our western coasts, where these fish are found, we shall remain doubtful whether we have done right in separating this from the former, especially as Doctor Gronovius has pronounced them to be only varieties.

* This color is most vivid during summer.
XXXI. GURNARD.

Noce floping.
Head covered with strong bony plates.
Seven branchioptegous rays.
Three slender appendages at the base of the pectoral fins.

137. GREY.

Gurnatus seu Gurnardus gri- 
feus, the Grey Gurnard. 
Wil. Ichth. 279. Raii syn. 
pisc. 88.
Trigla vario rostro diacantho, 
aculeis geminis ad utrum- 
que oculum. Arted. Synon. 
74.
Trigla Gurnardus, Tr. digitis 
ternis dorso maculis nigris 
rubrisque. Lin. Syst. 497. 

THE nose pretty long, and sloping: the end 
bifurcated, and each side armed with three 
short spines.

The eyes very large; above each were two short 
spines: the forehead and covers of the gills sil-
very; the last finely radiated.

The teeth small, placed in the lower and upper 
jaws, in the roof of the mouth, and base of the 
tongue.

Nostrils minute, and placed on the sides of the 
nose.

On the extremity of the gill covers was a strong, 
sharp, and long spine: beneath that, just above the 
pectoral fins, another.
GREY GURNARD.
Class IV. Grey Gurnard.

The first dorsal fin consisted of eight spiny rays; the sides of the three first tuberculated.

The second dorsal fin of nineteen soft rays: both fins lodged in a groove, rough on each side, but not serrated.

The pectoral fins do not extend as far as the anal fins, are transparent, and supported by ten rays, bifurcated from their middle: the three beards at their base as usual.

The ventral fins had six rays, the first spiny, and the shortest of all.

The anal fin nineteen, each soft.

The tail bifurcated.

The lateral line very prominent, strongly serrated, and of a silvery color.

The back, tail, and a small space beneath the side line, were of a deep grey, covered with small scales, and in parts spotted with white and yellow; the belly silvery.

These fish are usually taken with the hook in deep water, bite eagerly even at a red rag; and sometimes are fond of sporting near the surface. They are often found of the length of two feet and a half.
Red Gurnard. Class IV.

138. Red.  
Konvix €vp€vos, Athenaeus lib. VII. 309.  
Pelse capone, Cocco, Orphano. Sallian. 191.  
Le Rouget. Belon. 199.  
Cuculys. Rondel. 287. Gesner p irritation. 305.  
Smiedecknecht, Kurre-fische.  
Schonewelde, 37.  
Trigla tota rubens, rostro parum bicorni, operculis branchiarum striatis. Arted ly- non. 74.  

This species agrees in its general appearance with the tub fish; but in these particulars differs.

The covers of the gills are radiated: the spines are longer and slenderer in those of the red gurnard. The nose armed on each side with two sharp spines.

The fins and body are of a fuller red: the scales are larger: head less and narrower: the pectoral fins are edged with purple, not with blue: are much shorter, for when extended they do not reach to the anal fin. The side line is strongly ferrated: the top of the back less so than that of the tub fish. The tail red and almost even at the end.
This species is frequently taken on the western coasts of this kingdom, and esteemed an excellent fish. It is also found off Anglesea.

The weight of one which was communicated to us by Mr. Pitfield*, was three pounds and a half; the thickest circumference thirteen inches, the left, which was next the tail, only three: the length near two feet.

The head was very large, and that part of the body next to it very thick: the nose divided into two broad plates, each terminated with three spines: on the inner corner of each eye is a strong spine: the bony plates of the head terminate on each side with another.

The covers of the gills are armed with one very sharp and strong spine, and are prettily striated: immediately over the pectoral fin is another spine very large and sharp pointed.

* We have been informed, that this fish is found at all times of the year on the western coasts, and is taken in nets.
SAPPHIRINE GURNARD. Class IV.

The nostrils very minute: the eyes large.
The lower jaw much shorter than the upper: the teeth in both very minute.

The first dorsal fin consisted of nine very strong sharp spines, the second of which is the longest; the second fin begins just behind the first, and consists of eighteen soft rays: the pectoral fins were long, and had twelve branched rays; the ventral fins six, very strong and thick: the anal eighteen, the first spiny: the tail small, in proportion to the size of the fish, and forked.

The back on each side the dorsal fin was armed with a set of strong and very large spines, pointing towards the tail like the teeth of a saw.

The scales were small, but very hard and rough: the lateral line bent a little at its beginning, that went straight to the tail, and was almost smooth.

This species is of a more slender form than the preceding.

The pupil of the eye is green: on the inner cor-
Class IV. Streaked Gurnard.  

... of each are two small spines. But what at once distinguishes this from the other species is the breadth and colors of the pectoral fins, which are very broad and long, of a pale green, most beautifully edged, and spotted with rich deep blue.

The dorsal fins are lodged between two rows of spines, of a serrated form: the back is of a greenish cast: the side line is rough: the sides are tinged with red; the belly white.

These fish are found on the coast of Cornwall. We have also taken them off Anglesea.

Cuculus lineatus, the Streaked Gurnard.  *Raii SYN. PISC. 165.*  fig. 11.

*This is one of the Cornish fish communicated to Mr. Petiver by Mr. Jago. He says the head is large, and distinguished with stellated marks; the eyes great; the covering of the gills thorny; the mouth small, and without teeth. By the figure the nose seems not to be bifurcated. The pectoral fins large, and spotted, beneath them three filaments: the color of the body red: the belly white, marked with many streaks, pointing downwards, from the back.

Mr. Jago imagines it to be the Mullis imber-bis of Rondeletius. *Wil. Icth. 278.*

Sect.*
Eyes in the upper part of the head.
Aperture to the gills closed below.
Several beards on the end of the upper jaw.
Body of almost an equal thickness.
One dorsal fin.

THE loche is found in several of our small rivers, keeping at the bottom on the gravel, and is on that account, in some places, called the Groundling: it is frequent on the stream near Amesbury, in Wiltshire, where the sportsmen, through frolick, swallow it down alive in a glass of white wine.

The largest we ever heard of was four inches and three quarters in length, but they seldom arrive to that size.
The mouth is small, placed beneath, and has no teeth: on the upper mandible are six small beards, one at each corner of the mouth, and four at the end of the nose.

The dorsal fin consists of eight rays; the pectoral of eleven; the ventral of seven; the anal of six: the tail is broad, and has sixteen or seventeen rays.

The body is smooth and slippery, and almost of the same thickness: the color of the head, back, and sides, is in some white, in others of a dirty yellow, very elegantly marked with large spots, consisting of numberless minute black specks: the pectoral, dorsal, and caudal fins are also spotted: the belly and ventral fins of a pure white: the tail broad, and a little rounded.
XXXIII. Branchiostegous rays unequal in number.
Two dorsal fins; the second thick, and without rays.

* With teeth.

The salmon is a northern fish, being unknown in the Mediterranean sea, and other warm climates: it is found in France in some of the rivers that empty themselves into the ocean*, and north as far as Greenland; they are also very common in Newfoundland, and the northern parts of North America. Salmons are taken in the rivers of Kamtschatka†, but whether they are of the

* Rondel. fluviat. 167.
† Hild. Kamtsch. 143.
fame species with the *European* kind is not very certain.

They are in several countries a great article of commerce, being cured different ways, by salting, pickling, and drying: there are stationary fisheries in *Iceland, Norway*, and the *Baltic*, but we believe no where greater than those at *Colraine* in *Ireland*; and in *Great Britain* at *Berwick*, and in some of the rivers of *Scotland*.

The salmon was known to the *Romans*, but not to the *Greeks*: *Pliny* speaks of it as a fish found in the rivers of *Aquitaine*: *Ausonius* enumerates it among those of the *Mosel*.

_Nec te puniceo rutilantem viscerè Salmo_  
_Transferem, lata cujus vagas verbera caudae_  
_Gurgite de medio summas referuntur in undas,_  
_Occultus placido cum proditur aquore pulsus._  
_Tu loricato squamosus peōore, frontem_  
_Lubricus, et dubia facturus fercula cænae,_  
_Temporā longarum fers incorrupta morarum,_  
_Praefignis maculis capitis, cui prodiga nutat_  
_Abovus, opimatoque fluidus abdomine venter._

Nor I thy scarlet belly will omit,  
O Salmon, whose broad tail with whisking strokes  
Bears thee up from the bottom of the stream  
Quick to the surface; and the secret laft  
Below, betrays thee in the placid deep.  
Arm’d in thy flaky mail, thy glossy snout

* There was, about the year 1578, a pretty considerable salmon fishery at *Cola*, in *Russian Lapland*. *Hackluyt. voy. I. 416.*

Slippery
Slippery escapes the fisher's fingers; else
Thou makest a feast for nicest judging palates:
And yet long uncorrupted thou remainedst:
With spotted head remarked, and wavy spread,
Of paunch immense o'erflowing wide with fat.

Anonymous

The salmon is a fish that lives both in the salt
and fresh waters, quitting the sea at certain seasons
for the sake of depositing its spawn in security, in the
gravelly beds of rivers remote from their mouths.
There are scarce any difficulties but what they
will overcome, in order to arrive at places fit for
their purpose: they will ascend rivers hundreds of
miles, force themselves against the most rapid
streams, and spring with amazing agility over ca-
taracts of several feet in height. Salmon are fre-
quently taken in the Rhine as high up as Basle;
they gain the sources of the Lapland rivers* in
spite of their torrent-like currents, and surmount the
perpendicular falls of Leixlip†, Kennerth‡, and
Pont aberglaslyn§; these last feats we have been
witnessto, and seen the efforts of scores of fish, some
of which succeeded, others miscarried during the
time of our stay.

* Scheff. Lap. 139.
† Near Dublin.
‡ On the Tavy in South Wales, which Michael Drayton cele-
brates in his Polyolbion on this account.
§ Amidst Snowdon hills, a wild scene in the style of Salvator
Rosa.
It may here be proper to contradict the vulgar error of their taking their tail in their mouth when they attempt to leap; such as we saw, sprung up quite straight, and with a strong tremulous motion.

Other particulars relating to the natural history of this fish, we shall relate in our accounts of the fisheries, either from our own observations, or from such as have been communicated to us from different places: the fullest we have been favoured with, is from the late Mr. Potts, of Berwick, to whom the public is indebted for the following very curious history of the salmon fishery on the Tweed.

At the latter end of the year, or in the month of November, the salmon begin to press up the rivers as far as they can reach, in order to spawn; when that time approaches they search for a place fit for the purpose: the male and female unite in forming a proper receptacle for it in the sand or gravel, about the depth of eighteen inches; in this the female deposits her spawn, the male his milt, which they cover carefully, as it is said, with their tails, for after spawning they are observed to have no skin on that part.

The spawn lies buried till spring, if not disturbed by violent floods; but the salmon hasten to sea as soon as they are able, to purify and cleanse themselves, and to recover their strength; for after spawning they become very poor and lean, and then are called Kipper.

When the salmon first enter the fresh water, they are

---

Class IV.  
SALMON.

287
are observed to have abundance of insects adhering to them, especially above the gills: these are the *Lernæae Salmoneæ* of Linnaeus, and are signs that the fish are in high season. These animals die and drop off, soon after the salmon have left the sea.

About the latter end of March the spawn begins to exclude the young, which gradually increase to the length of four or five inches, and are then termed *Smelts* or *Smouts*: about the beginning of May the river is full of them; it seems to be all alive; there is no having an idea of the numbers without seeing them; but a seasonable flood then hurries them all to the sea, scarce any or very few being left in the river.

About the middle of June the earliest of the fry begin to drop, as it were, into the river again from the sea, at that time about twelve, fourteen, or sixteen inches, and by a gradual progress, increase in number and size till about the end of July, which is at Berwick termed the height of Gilfe time, the name given to the fish at that age: the end of July, or beginning of August, they lessen in number, but increase in size, some being six, seven, eight, or nine pounds in weight; this appears to be a surprising quick growth, yet we have received from a gentleman at Warrington, an instance still more so: a kipper salmon weighing 7 lb. three quarters, taken on the 7th of February, being marked with a scissars, on the back, fin, and tail, and turned into the river, was again taken.
Class IV. SALMON.

taken on the 17th of March following, and then was found to weigh 17 lb. and a half.

All fishermen agree, that they never find any food in the stomach of this fish. It is likely they may neglect their food entirely during the time of spawning, as sea lions and sea bears are known to do for months together during their breeding season: and it may be observed, that like those animals, the salmons return to the sea lank and lean, and come from the salt water in good condition. It is evident that at times their food is both fish and worms, for the angler uses both with good success; as well as a large, gaudy, artificial fly, which probably the fish mistakes for a gay libellula or dragon fly.

The capture in the Tweed, about the month of July, is prodigious; in a good fishery, often a boat load, and sometimes near two, are taken in a tide: some few years ago there were above seven hundred fish taken at one hawl, but from fifty to a hundred is very frequent: the coopers in Berwick then begin to salt both Salmon and Gilfes in pipes, and other large vessels, and afterwards barrel* them to send abroad, having then far more than the London markets can take off their hands.

Most of the salmon taken before April, or to the setting in of the warm weather, is sent fresh to Lon-

* The salmon barrel holds above forty-two gallons, wine measure.
SALMON. CLASS IV.

*don in baskets, unless now and then the vessel is disappointed by contrary winds, of failing immediately; in that case the fish is brought ashore again to the cooper's offices, and boiled, pickled, and kitted, and sent to the London markets by the same ship, and fresh salmon put in the baskets in lieu of the stale ones. At the beginning of the season, when a ship is on the point of failing, a fresh clean salmon will fall from a shilling to eighteen pence a pound, and most of the time that this part of the trade is carried on, the prices are from five to nine shillings per stone*, the value rising and falling according to the plenty of fish, or the prospect of a fair or foul wind. Some fish are sent in this manner to London the latter end of September, when the weather grows cool, but then the fish are full of large roes, grow very thin bellied, and are not esteemed either palatable or wholesome.

The price of fresh fish in the month of July, when they are most plentiful, has been known to be as low as 8d. per stone, but last year never less than 16d. and from that to 2s. 6d.

The season for fishing in the Tweed begins November 30th, but the fishermen work very little till after Christmas; it ends on Michaelmas-Day; yet the corporation of Berwick (who are conservators

* A stone of salmon weighs 18 lb. 10 oz. and half, or in other terms, four stones, or fifty-six pounds avoirdupois, is only three stones, or forty-two pounds, fish weight at Berwick.
of the river) indulge the fishermen with a fortnight past that time, on account of the change of the style.

There are on the river forty-one considerable fisheries extending upwards, about fourteen miles from the mouth (the others above being of no great value) which are rented for near 5400l. per annum. The expense attending the servants wages, nets, boats, &c. amount to 5000l. more, which together makes up the sum 10400l. Now in consequence the produce must defray all, and no less than twenty times that sum of fish will effect it, so that 208000 salmon must be caught there one year with another.

There is a misfortune attending the river Tweed, which is worthy a parliamentary remedy; for there is no law for preserving the fish in it during the fence months, as there is in the case of many other British rivers. This being the boundary between the two kingdoms, part of it belongs to the city of Berwick, and the whole north side (beginning about two miles from the town) is entirely Scotch property. From some disagreement between the parties they will not unite for the preservation of the fish, so that in some fisheries on the north side they continue killing salmon the whole winter, when the death of one fish is the destruction of thousands*.

* I think that this grievance is now removed.

U 2 The
The legislature began very early to pay attention to this important article: by the 13th Edward I. there is an act which prohibits the capture of the salmon from the Nativity of our Lady to St. Martin's Day, in the waters of the Humber, Owfe, Trent, Done, Arre, Derwent, Wharfe, Nid, Yore, Swale, and Tees; and other monarchs in after-times, provided in like manner for the security of the fish in other rivers.

Scotland possesses great numbers of fine fisheries on both sides of that kingdom. The Scotch in early times had more severe laws against the killing of this fish; for the third offence was made capital, by a law of James IV. Before that, the offender had power to redeem his life*. They were thought in the time of Henry VI. a present worthy of a crowned head, for in that reign the Queen of Scotland sent to the Duchesses of Clarence, ten casks of salted salmon; which Henry directed to pass duty-free. The salmon are cured in the same manner as at Berwick, and a great quantity is sent to London in the spring; but after that time the adventurers begin to barrel and export them to foreign countries: but we believe that commerce is far less lucrative than it was in former times, partly owing to the great encrease of the Newfoundland fishery, and partly to the general relaxation of the discipline of abstinence in the Roman church.

Class IV. Salmon.

Ireland (particularly the north) abounds with this fish: the most considerable fishery is at Cranna, on the river Ban, about a mile and an half from Coleraine. When I made the tour of that hospitable kingdom in 1754, it was rented by a neighboring gentleman for 620l. a year, who assured me that the tenant, his predecessor, gave 1600l. per ann. and was a much greater gainer by the bargain for the reasons before-mentioned, and on account of the number of poachers who destroy the fish in the fence months.

The mouth of this river faces the north, and is finely situated to receive the fish that roam along the coast, in search of an inlet into some fresh water, as they do all along that end of the kingdom which opposes itself the northern ocean. We have seen near Ballicastle, nets placed in the sea at the foot of the promontories that jut into it, which the salmon strike into as they are wandering close to shore, and numbers are taken by that method.

In the Ban they fish with nets eighteen score yards long, and are continually drawing night and day the whole season, which we think lasts about four months, two sets of sixteen men each alternately relieving one another. The best drawing is when the tide is coming in: we were told that at a single draught there were once eight hundred and forty fish taken.

A few miles higher up the river is a ware, where a considerable number of fish that escape the nets are
are taken. We were lately informed, that in the year 1760 about 320 tons were taken in the Cran-na fishery.

The salmon are cured in this manner: they are first split, and rubbed with fine salt; and after lying in pickle in great tubs, or reservoirs, for six weeks, are packed up with layers of coarse brown Spanish salt in casks, six of which make a ton. These are exported to Legborn and Venice at the price of twelve or thirteen pounds per ton, but formerly from sixteen to twenty-four pounds each.

The salmon is a fish so generally known, that a very brief description will serve. The largest we ever heard of weighed seventy-four pounds. The color of the back and sides are grey, sometimes spotted with black, sometimes plain: the covers of the gills are subject to the same variety: the belly silvery: the nose sharp pointed: the end of the under jaw in the males often turns up in form of a hook; sometimes this curvature is very considerable: it is said that they lose this hook when they return to the sea.

The teeth are lodged in the jaws and on the tongue, and are slender, but very sharp.

The tail is a little forked.
The Grey, i.e. cinereous Salmo eriox. Linn. fost. 509.

Salmo eriox. Linn. 509.

The Grey, i.e. cinereous feu Grifeus. Wil. Isth. 193.


Lachfs-forellen mit Schwartz-grauen flecken oder punkt-


We are uncertain whether this is not a meer variety of the salmon; but on the authority of Mr. Ray, we describe them separate. He says it is a very strong fish, that it does not ascend the fresh waters till August, when it rushes up with great violence, that it is rarely taken, and not much known.

The inhabitants of the North of England and of South Wales seem extremely well assured, that it is a distinct species from the salmon. They appear in the Esk in Cumberland from July to September, and are then in spawn. The lower jaw grows hooked, when they are out of season. I was informed they never exceeded thirteen pounds in weight.*

The head is larger in proportion than that of the salmon. In the jaws are four rows of teeth: and on the tongue are eight teeth. The back and sides, above the lateral line, of a deep grey, spotted

* I met with a fish (I suspected to be a Grey) taken in the sea near Conway. It weighed twenty-two pounds.

U 4

with
with number of purplish spots. The belly silvery. The tail even at the end.

THIS we believe to be the Sewin, or Shewin of South Wales. The description above, was communicated to us by Doctor Roberts of Herefordshire.


T HIS species migrates like the salmon up several of our rivers; spawns, and returns to the sea. That, which I describe, was taken in the Tweed below Berwick, June 1769.

The shape was more thick than the common trout. The weight three pounds two ounces. The irides silvery: the head thick, smooth, and dusky, with a gloss of blue and green: the back of the same color, which grows fainter towards the side line. The back is plain, but the sides as far as the lateral line marked with large, distinct, irregularly shaped spots of black: the lateral line strait: the
the sides beneath the line, and the belly are white.
Tail broad, and even at the end.
The dorsal fin had twelve rays: the pectoral fourteen: the ventral nine: the anal ten.
The flesh when boiled is of a pale red, but well flavored.

Mr. Willughby's account of the Salmon, Bull, or Scurf Trout obscure. Whether the same with this?

Salar. Aufonius Mosel. 88.
Salar et varius, Trotta. Sal-vian. 96.
La Truitte. Belon, 274.
Foren, Forellen. Schonevelde, 77.

It is matter of surprize that this common fish has escaped the notice of all the antients, except Aufonius: it is also singular, that so delicate a species should be neglected at a time when the folly of the table was at its height; and that the epicures should overlook a fish that is found in such quantities in the lakes of their neighborhood, when they ransacked the universe for dainties. The milts of Murane were brought from one place;
the livers of Scari from another *; and Oysters even from so remote a spot as our Sandwich †: but there was, and is a fashion in the article of good living. The Romans seem to have despised the trout, the piper, and the doree; and we believe Mr. Quin himself would have resigned the rich paps of a pregnant sow ‡, the heels of camels §, and the tongues of Flamingos ‖, though dressed by Heliogabalus's cooks, for a good jowl of salmon with lobster sauce.

When Ausonius speaks of this fish, he makes no euloge on its goodness, but celebrates it only for its beauty.

Purpureisque Salar siellatus Tergore guttis.

With purple spots the Salar's back is stained.

These marks point out the species he intended: what he meant by his Fario is not so easy to determine: whether any species of trout, of a size between the salar and the salmon; or whether the salmon itself, at a certain age, is not very evident.

* Suetonius, vita Vitellii.
† Juvenal Sat. IV. 141.
‡ Martial, Lib. XIII. Epig. 44.
§ Lamprid. vit. Heliogab.
‖ Martial, Lib. XII. Epig. 71.
Class IV. T R O U T.

Tegue inter geminos species, neutrumque et utrumque,
Qui nec dum Salmo, nec Salar ambiguusque.
Amborum medio Fario intercepte sub anno.

Salmon or Salar, I'll pronounce thee neither;
A doubtful kind, that may be none, or either,
Fario, when stop't in middle growth.

In fact the colors of the trout, and its spots, vary greatly in different waters, and in different seasons; yet each may be reduced to one species. In Llyndivi, a lake in South Wales, are trouts called Coch y dail, marked with red and black spots as big as six-pences; others unspotted, and of a reddish hue, that sometimes weigh near ten pounds, but are bad tasted.

In Lough Neagh in Ireland, are trouts called there Buddaghs, which I was told sometimes weighed thirty pounds, but it was not my fortune to see any during my stay in the neighborhood of that vast water.

Trouts (probably of the same species) are also taken in Hulse-water, a lake in Cumberland, of a much superior size to those of Lough Neagh. These are supposed to be the same with the trout of the lake of Geneva, a fish I have eaten more than once, and think but a very indifferent one.

In the river Eynion, not far from Mackynleth, in Merionethshire, and in one of the Snowdon lakes, are found a variety of trout, which are naturally deformed, having a strange crookedness near the tail,
tail, resembling that of the perch before described. We dwell on these monstrous productions, as our friend the Hon. Daines Barrington, has already given an account of them in an ingenious dissertation on some of the Cambrian fish, published in the Philosophical Transactions of the year 1767.

The stomachs of the common trouts are uncommonly thick, and muscular. They feed on the shell-fish of lakes and rivers, as well as on small fish. They likewise take into their stomachs gravel, or small stones, to assist in comminuting the testaceous parts of their food. The trouts of certain lakes in Ireland, such as those of the province of Galway, and some others, are remarkable for the great thickness of their stomachs, which, from some slight resemblance to the organs of digestion in birds, have been called gizzards: the Irish name the species that has them, Gillaroo trouts. These stomachs are sometimes served up to table, under the former appellation. It does not appear to me, that the extraordinary strength of stomach in the Irish fish, should give any suspicion, that it is a distinct species: the nature of the waters might increase the thickness; or the superior quantity of shell-fish, which may more frequently call for the use of its comminuting powers than those of our trouts, might occasion this difference. I had opportunity of comparing the stomach of a great


Gillaroo
Class IV. T R O U T.

Gillaroo trout, with a large one from the Uxbridge river. The last, if I recollect, was smaller, and out of season; and its stomach (notwithstanding it was very thick) was much inferior in strength to that of the former: but on the whole, there was not the least specific difference between the two subjects.

Trouts are most voracious fish, and afford excellent diversion to the angler: the passion for the sport of angling is so great in the neighborhood of London, that the liberty of fishing in some of the streams in the adjacent counties, is purchased at the rate of ten pounds per annum.

These fish shift their quarters to spawn, and, like salmon, make up towards the heads of rivers to deposit their roes. The under jaw of the trout is subject, at certain times, to the same curvature as that of the salmon.

A trout taken in Llynallet, in Denbighshire, which is famous for an excellent kind, measured seventeen inches, its depth three and three quarters, its weight one pound ten ounces: the head thick; the nose rather sharp: the upper jaw a little longer than the lower; both jaws, as well as the head, were of a pale brown, blotched with black: the teeth sharp and strong, disposed in the jaws, roof of the mouth and tongue, as is the case with the whole genus, except the Gwyniad, which is toothless, and the Grayling, which has none on its tongue.

The
The back was dusky; the sides tinged with a purplish bloom, marked with deep purple spots, mixed with black, above and below the side line which was straight: the belly white.

The first dorsal fin was spotted; the spurious fin brown, tipped with red; the pectoral, ventral, and anal fins, of a pale brown; the edges of the anal fin white: the tail very little forked when extended.

147. *White.*

This species migrates out of the sea into the river *Esk* in Cumberland from July to September, and is called from its color the *Whiting.* When dressed, their flesh is red, and most delicious eating. They have, on their first appearance from the salt water, the *lernæa salmonea,* or salmon louse, adhering to them. They have both melt and spawn; but no fry has as yet been observed. This is the fish called by the Scots, *Phinocs.*

They never exceed a foot in length. The upper jaw is a little longer than the lower: in the first are two rows of teeth; in the last, one: on the tongue are six teeth.

The back is straight: the whole body of an elegant form: the lateral line is straight; color, between that and the top of the back, dusky and silvery intermixed; beneath the line of an exquisite
THE samlet is the left of the trout kind, is
frequent in the Wye, in the upper part of the
Severn, and the rivers that run into it, in the north
of England, and in Wales. It is by several ima-
gined to be the fry of the salmon; but our reasons
for dissenting from that opinion are these:
First, It is well known that the salmon fry ne-
ever continue in fresh water the whole year; but as
numerous as they appear on their first escape from
the spawn, all vanish on the first vernal flood that
happens, which sweeps them into the sea, and
leaves scarce one behind.
Secondly, The growth of the salmon fry is so
quick and so considerable, as suddenly to exceed
the bulk of the largest samlet: for example, the
fry that have quitted the fresh water in the spring,
not larger than gudgeons, return into it again a
foot or more in length.

Thirdly,
Thirdly, The salmon attain a considerable bulk before they begin to breed: the famlets, on the contrary, are found male and female* (distinguished by the milt and roe) of their common size.

Fourthly, They are found in the fresh waters in all times of the year, and even at seasons when the salmon fry have gained a considerable size. It is well known, that near Shrewsbury (where the are called Samfons) they are found in such quantities in the month of September, that a skilful angler, in a coracle, will take with a fly from twelve to sixteen dozen in a day.

They spawn in November and December, at which time those of the Severn push up towards the head of that fair river, quitting the lesser brooks, and return into them again when they have done.

They have a general resemblance to the trout, therefore must be described comparatively.

First, The head is proportionably narrower, and the mouth less than that of the trout.

Secondly, Their body is deeper.

Thirdly, They seldom exceed six or seven inches in length: at most, eight and a half.

Fourthly, The pectoral fins have generally but one large black spot, though sometimes a single small one attends it; whereas the pectoral fins of the trout are more numerously marked.

Fifthly, The spurious or fat fin on the back is

* It has been vulgarly imagined, that there were no other than males of this species.
never tipped with red; nor is the edge of the anal fin white.

Sixthly, The spots on the body are fewer, and not so bright.

It is also marked from the back to the sides with six or seven large bluish bars; but this is not a certain character, as the same is sometimes found in young trouts.

Seventhly, The tail of the smelt is much more forked than that of the trout.

These fish are very frequent in the rivers of Scotland, where they are called Pars. They are also common in the Wye, where they are known by the name of Skirlings, or Lasprings.

L'Omble, ou Humble. Belon, 281.
Umbla seu Humble Belonii. Gefner pisc. 1005.
Umbla minor. Gefner pisc. 1013.

149. Charr.
Salmo vix pedalis, pinnis ventralibus rubris, maxilla inferiori longiore. Arted. syn. 25.
Salmo alpinus. Lin. Syst. 510.
Phil. Trans. 1755.

THE charr is an inhabitant of the lakes of the north, and of those of the mountainous parts of Europe. It affects clear and pure waters, and is very rarely known to wander into running streams,
streams, except into such whose bottom is similar to the neighboring lake.

It is found in vast abundance in the cold lakes on the summits of the Lapland Alps, and is almost the only fish that is met with in any plenty in those regions; where it would be wonderful how they subsisted, had not Providence supplied them with innumerable larve of the Gnat kind*: these are food to the fish, who in their turn are a support to the migratory Laplanders in their summer voyages to the distant lakes.

In such excursions those vacant people find a luxurious and ready repast in these fish, which they dress and eat without the addition† of sauces; for exercise and temperance render useless the inventions of epicurism.

*A pupil of Linnaeus remarks in the fourth volume of the Aman. Acad. p. 156, that the same insects which are such a pest to the rein deer, afford sustenance to the fish of the vast lakes and rivers of Lapland. But at the same time that we wonder at Linnaeus's inattention to the food of the birds and fish of that country, which abound even to a noxious degree, we must, in justice to that Gentleman, acknowledge an oversight of our own in the second volume of the British Zoology, p. 522, edition the second, where we give the Lapland waters only one species of water plant; for on a more careful review of that elaborate performance, the Flora Lapponica, we discover three other species, viz. Scirpus, No. 18, Alopecurus, No. 38, Ranunculus, No. 234; but those so thinly scattered over the Lapland lakes, as still to vindicate our assertion, as to the scarceness of plants in the waters of alpine countries.

† Arted. Sp. pisd. 52.
There are but few lakes in our island that produce this fish, and even those not in any abundance. It is found in Winander Mere in Westmorland; in Llyn Quellyn, near the foot of Snowdon; and before the discovery of the copper-mines, in those of Llynberris, but the mineral streams have entirely destroyed the fish in the last lakes*. Whether the waters in Ireland afford the char, we are uncertain, but imagine not, except it has been overlooked by their writers on the natural history of that kingdom. In Scotland it is found in Loch Inch, and other neighboring lakes, and is said to go into the Spey to spawn.

The largest and most beautiful we ever received were taken in Winander Mere, and were communicated to us by the Rev. Mr. Farrish of Carlisle, with an account of their natural history. He favored me with five specimens, two under the name of the Cafe Charr, male and female; another he called the Gelt Charr, i.e. a char which had not spawned the preceding season, and on that account is reckoned to be in the greatest perfection. The two others were inscribed, the Red Charr, the Silver or Gilt Charr, the Carpio Lacus Benaci, Raii syn. pisc. 66, which last are in Westmorland distinguished by the epithet red, by reason of the flesh assuming a higher color than the other when dressed.

* They are also found in certain lakes in Merionethshire.
On the closest examination, we could not discover any specific differences in these specimens, therefore must describe them as the same fish, subject only to a slight variation in their form, hereafter to be noted. But there is in another respect an essential difference, we mean in their economy, which is in all beings invariable; the particulars we shall deliver in the very words of our obliging informant.

The *Umbla minor*, or cafe char, spawns about Michaelmas, and chiefly in the river Brathy, which uniting with another called the Rowthay, about a quarter of a mile above the lake, they both fall into it together. The Brathy has a black rocky bottom; the bottom of the Rowthay is a bright sand, and into this the char are never observed to enter. Some of them however spawn in the lake, but always in such parts of it which are stony, and resemble the channel of the Brathy. They are supposed to be in the highest perfection about May, and continue so all the summer, yet are rarely caught after April. When they are spawning in the river they will take a bait, but at no other time, being commonly taken, as well as the other species, in what they call breast nets, which are in length about twenty-four fathoms, and about five, where broadest.

The season which the other species spawns in is from the beginning of January to the end of March. They are never known to ascend the rivers,
rivers, but always in those parts of the lake which are springy, where the bottom is smooth and sandy, and the water warmest. The fishermen judge of this warmth, by observing that the water seldom freezes in the places where they spawn, except in intense frosts, and then the ice is thinner than in other parts of the lake. They are taken in greatest plenty from the end of September to the end of November: at other times they are hardly to be met with. This species is much more esteemed for the table than the other, and is very delicate when potted.

We must observe, that this account of the spawning season of the Westmorland charrs, agrees very nearly with that of those of Wales, the last appearing about a month later, keep moving from side to side of the pool, and then retire into the deep water, where they are sometimes but rarely taken.

This remarkable circumstance of the different season of spawning in fish, apparently the same (for the red charr of Winander, is certainly not the Carpio Lacus Benaci) puzzles us greatly, and makes us wish that the curious, who border on that lake, would pay farther attention to the natural history of these fish, and favor us with some further lights on the subject.

We shall now describe the varieties by the names ascribed to them in the north.

The length of the red charr to the division in its tail, was twelve inches; its biggest circumference $X_3$ almost
almost seven. The first dorsal fin five inches and three quarters from the tip of its nose, and consisted of twelve branched rays: the first of which was short, the fifth the longest: the fat fin was very small.

Each of the five fish had double nostrils, and small teeth in the jaws, roof of the mouth, and on the tongue.

The head, back, dorsal fin, and tail of each, was of a dusky blue; the sides rather paler, marked with numbers of bright red spots: the bellies of the Red Charr were of a full and rich red; those of the Cave Charr rather paler; from this particular the Welch call these fish Torgoch, or red belly.

The first rays of the anal and ventral fins of each, were of a pure white; the rest of each fin on the lower part of the body, tinged with red.

The lateral line straight, dividing the fish in two equal parts, or nearly so.

The jaws of the Cave Charr are perfectly even; on the contrary, those the Red Charr were unequal, the upper jaw being the broadest, and the teeth hung over the lower, as might be perceived on passing the finger over them.

The branchiostegous rays were, on different sides of the same fish, unequal in number, viz. 12,—11, 11,—10, 10—9, except in one, where they were 11,—11.

The Gelt, or Barren Charr, was rather more slender
flender than the others, as being without spawn.
The back of a glossy dusky blue: the sides silvery, mixed with blue, spotted with pale red: the sides of the belly were of a pale red, the bottom white.

The tails of each bifurcated.

The charrs we have seen, brought from Snowdon lakes, were rather smaller than those of Westmorland, their colors paler. The supposed males very much resemble the Gelt Charr; but that is not a certain distinction of sex, for the Rev. Mr. Farrington *, has told me that the fishermen do not make that distinction.

THE grayling haunts clear and rapid streams, and particularly such that flow through mountainous countries. It is found in the rivers of Derbyshire; in some of those of the north; in

* Who favored the Royal Society with a paper on the Welch charr. Vide Phil. Trans. 1755.
the Tame near Ludlow; in the Lug, and other streams near Leominster; and in the river near Christchurch, Hampshire. It is also very common in Lapland; the inhabitants make use of the guts of this fish instead of rennet, to make the cheese which they get from the milk of the rein deer*.

It is a voracious fish, rises freely to the fly, and will very eagerly take a bait. It is a very swift swimmer, and disappears like the transient passage of a shadow, from whence we believe is derived the name of Umbra.

\[ \text{Effugiensque oculos celeri levis Umbra natatu} \]

The Umbra swift escapes the quickest eye.

\[ \text{Thymalus and Thymus, are names bestowed on it on account of the imaginary scent, compared by some to that of thyme; but we never could perceive any particular smell.} \]

\[ \text{Descrip.} \]

It is a fish of an elegant form; less deep than that of a trout: the largest we ever heard of was taken near Ludlow, which was above half a yard long, and weighed four pounds six ounces, but this was a very rare instance.

The irides are silvery, tinged with yellow: the teeth very minute, seated in the jaws and the roof of the mouth, but none on the tongue: the head is dusky: the covers of the gills of a glossy green:

† Aufonii Mosel. 90.
Class IV. Smelt.

The back and sides of a fine silvery grey, but when the fish is just taken, varied slightly with blue and gold: the side-line is strait.

The scales large, and the lower edges dusky, forming strait rows from head to tail.

The first dorsal fin has twenty-one rays; the three or four first are the shortest, the others almost of equal lengths; this fin is spotted, all the others are plain.

The tail is much forked.

Epelan de mer. Belon, 282.
Eperlanus. Rondel. fluviat.
Spirincus et Stincus. Gesner
Paralip. 29.
A Spyrling a Sprote. Turner
epiš. ad. Gesn.
Stindt, et Stinckfisch. Scho-
nevelde, 70.

The Smelt inhabits the seas of the northern parts of Europe, and we believe never is found as far south as the Mediterranean: the Seine is one of the French rivers which receive it, but whether it is found south of that, we have not at present authority to say. If we can depend on the observations of navigators, who generally have too much to think of to attend to the minutiae of natural history, these fish are taken in the straits of Magellan,
Magellan*, and of a most surprising size, some measuring twenty inches in length, and eight in circumference.

They inhabit the seas that wash these islands the whole year, and never go very remote from shore, except when they ascend the rivers. It is remarked in certain rivers that they appear a long time before they spawn, being taken in great abundance in November, December, and January, in the Thames and Dee, but in others not till February, and in March and April they spawn; after which† they all return to the salt water, and are not seen in the rivers till the next season. It has been observed, that they never come into the Mersey as long as there is any snow water in the river.

These fish vary greatly in size, but the largest we ever heard of was thirteen inches long, and weighed half a pound.

They have a very particular scent, from whence is derived one of their English names Smelt, i.e. smell it. That of Sparling, which is used in Wales and the north of England, is taken from the French Eperlan. There is a wonderful disagreement in the opinion of people in respect to the scent of this fish; some assert it flavors of the violet; the Ger-

* Narborough's Voy. 123.
† In the river Conway, near Llanrwst, and in the Mersey they never continue above three or four weeks.
mans, for a very different reason, distinguish it by the elegant title of *Stinckfisch*.

Smelts are often sold in the streets of London split and dried. They are called dried *Sparlings*, and are recommended as a relish to a glass of wine in the morning.

It is a fish of a very beautiful form and colour: the head is transparent, and the skin in general so thin, that with a good microscope the blood may be observed to circulate.

The irides are silvery: the pupil of a full black: the under jaw is the longest: in the front of the upper jaw are four large teeth; those in the sides of both are small; in the roof of the mouth are two rows of teeth; on the tongue two others of large teeth.

The first dorsal fin has eleven rays; the pectoral fins the same number; the ventral eight; the anal fourteen.

The scales are small, and readily drop off: the tail consists of nineteen rays, and is forked.

The color of the back is whitish, with a cast of green, beneath which it is varied with blue, and then succeeds a beautiful gloss of a silvery hue.

* And not without reason, if we may depend on *Linnæus*, who says there are in the *Baltic* two varieties, the one, which is called *Nors, satidissimus, stercoreis instar*, which in the early spring, when the peasants come to buy it, fills all the streets of *Upfal* with the smell. He adds, that at this season agues reign there. *Faun. fuc. p. 125.*
** Without Teeth.

Albula nobilis, Snepel, Helte? Schonewulde, 12.
Albula cārulea. Scheuchzer it. Alp. II. 481.
Salmo Lavaretus. Lin. fīs. 512.
Guiniad. Phil. Trans. 1767. 211.

THIS fish is an inhabitant of several of the lakes of the Alpine parts of Europe. It is found in those of Switzerland, Savoy, and Italy; of Norway, Sweden, Lapland*, and Scotland; in

* Schöffer, in his history of Lapland, p. 140. says, that these fish are caught there of the weight of ten or twelve pounds. We with Linnaeus had executed his intention of favoring the world with his Lachetsis Lapponica, in which he promised a complete history of that country. I once reminded him of it, and it is with true regret, that I give his answer: Nunc nimis sérō inciperem,

Me quoque debilitat series immensa laborum,
Ante meum tempus cogor et esse senem:
Firma sit illa licet solvetur in aequore navis,
Quae nunquam liquidis sicca carebit aquis.

thofe
Class IV. G W I N I A D.

those of Ireland, and of Cumberland; and in Wales, in that of Llynegi, near Bala, in Merionethshire.

It is the same with the Ferra of the lake of Geneva, the Schelly*, of Hulše-water, the Pollen of Lough Neagh, and the Vangis and Juvangis of Loch Mabon. The Scotch have a tradition that it was first introduced there by the beauteous queen, their unhappy Mary Stuart; and as in her time the Scotch court was much frenchified, it seems likely that the name was derived from the French, vendois, a dace; to which a slight observer might be tempted to compare it from the whiteness of its scales. The British name Gwiniad, or whiting, was bestowed on it for the same reason.

It is a gregarious fish, and approaches the shores in vast shoals in spring and in summer, which prove in many places a blessed relief to the poor of inland countries, in the same degree as the annual return of the herring is to those who inhabit the coasts. The Rev. Mr. Farriſh, of Carlisle, wrote me word, that he was assured by a Hulſe-water fisherman, that last summer he took between seven and eight thousand at one draught. I must not pass by that gentleman without acknowledging my obligations to him for an account of the Charrs and the Schelly; he being one of the valuable embellishers of this work, for whom I am indebted to the friendship of his late worthy prelate.

* The inhabitants of Cumberland give this name also to the chub, from its being a scaly fish.
The *Gwiniad* is a fish of an insipid taste, and must be eaten soon, for it will not keep long; those that choose to preserve them do it with salt. They die very soon after they are taken. Their spawning season in *Llyntegid* is in December.

It has long ago been observed in *Cambden*, that these fish never wander into the Dee, nor the salmon never ventures into the lake: this must be allowed to be generally the case; but by accident the first have been known to stray as far as *Llandrillo*, six miles down the river, and a salmon has now and then been found trespassing in the lake.

The largest *Gwiniad* we ever heard of weighed between three and four pounds: we have a *Ferra* we brought with us out of *Switzerland*, that is fifteen inches long; but these are uncommon sizes: the fish which we describe was eleven inches long, its greatest depth three.

The head small, smooth, and of a dusky hue: the eyes very large: the pupil of a deep blue: the nose blunt at the end: the jaws of equal length: the mouth small and toothless: the branchiostegous rays nine: the covers of the gills silver, powdered with black.

The back is a little arched, and slightly carinated: the color, as far as the lateral line, glossed with deep blue and purple, but towards the lines assumes

---

* Vol. II. 790.
† *Hon. D. Barrington's Letter to Dr. Watson*. Phil. Tranf. 1767.
a silvery cast, tinged with gold, beneath which those colors entirely prevale.

The side line is quite straight, and consists of a series of distinct spots of a dusky hue: the belly is a little prominent, and quite flat on the bottom.

The first dorsal fin is placed almost in the middle, and consists of fourteen branched rays; the second is thin, transparent, and not distant from the tail.

The pectoral fins had eighteen rays, the first the longest, the others gradually shortening; the ventral fins were composed of twelve, and the anal of fifteen, all branched at their ends; the ventral fins in some are of a fine sky blue, in others as if powdered with blue specks; the ends of the other lower fins are tinged with the same color.

The tail is very much forked: the scales large, and adhere close to the body.
PIKE.  

Upper jaw shorter than the lower.

Body long, slender, compressed sideways.

One dorsal fin placed near the tail.

The pike is common in most of the lakes of Europe, but the largest are those taken in Lapland, which, according to Schæffer, are sometimes eight feet long. They are taken there in great abundance, dried, and exported for sale. The largest fish of this kind which we ever heard of in England, weighed thirty-five pounds.

According to the common saying, these fish were introduced into England in the reign of Henry VIII. in 1537. They were so rare, that a pike was sold for double the price of a house-lamb in February, and a pickerel for more than a fat capon. How far this may be depended on, I cannot say, for this fish is mentioned in the Boke of St. Albons, printed in the year 1496, and is not there spoke of as a scarce fish, as was then the case with respect to the carp. Great numbers of this fish were dressed in the year 1466, at the great feast given by George Nevil, Archbishop of York.

All writers who treat of this species bring instances of its vast voraciousness. We have known one that was choaked by attempting to swallow one
one of its own species that proved too large a morsel. Yet its jaws are very loosely connected; and have on each side an additional bone like the jaw of a viper, which renders them capable of greater distension when it swallows its prey. It does not confine itself to feed on fish and frogs; it will devour the water rat, and draw down the young ducks as they are swimming about. In a manuscript note which we found, p. 244, of our copy of Plott's History of Staffordshire, is the following extraordinary fact: "At Lord Gower's canal at "Trentham, a pike seized the head of a swan as "she was feeding under water, and gorged so "much of it as killed them both. The servants "perceiving the swan with its head under water "for a longer time than usual, took the boat, "and found both swan and pike dead*.

But there are instances of its fierceness still more surprising, and which indeed border a little on the marvellous. Gesner † relates, that a famished pike in the Rhone seized on the lips of a mule that was brought to water, and that the beast drew the fish out before it could disengage itself. That people have been bit by these voracious creatures while they were washing their legs, and that they will

* This note we afterwards discovered was wrote by Mr. Plott, of Oxford, who assured me he inserted it on good authority.
† Gesner p. 503.
even contend with the otter for its prey, and endeavour to force it out of its mouth.

Small fish shew the same uneasiness and detention at the presence of this tyrant, as the little birds do at the sight of the hawk or owl. When the pike lies dormant near the surface (as is frequently the case) the lesser fish are often observed to swim around it in vast numbers, and in great anxiety. Pike are often haltered in a noose, and taken while they lie thus asleep, as they are often found in the ditches near the Thames in the month of May.

In the shallow water of the Lincolnshire fens they are frequently taken in a manner peculiar, we believe, to that county, and the isle of Ceylon. The fishermen make use of what is called a crown-net, which is no more than a hemispherical basket, open at top and bottom. He stands at the end of one of the little fenboats, and frequently puts his basket down to the bottom of the water, then poking a stick into it, discovers whether he has any booty by the striking of the fish; and vast numbers of pike are taken in this manner.

**Longevity.**

The longevity of this fish is very remarkable, if we may credit the accounts given of it. Rzaczynski tells us of one that was ninety years old;

* Walton. 157.
† Knox’s Hist. Ceylon, 28.
‡ Hist. Nat. Poloniae, 152.

**but**
but Gesner* relates, that in the year 1497, a pike was taken near Hailbrun, in Suabia, with a brazen ring affixed to it, on which were these words in Greek characters: *I am the fish which was first of all put into this lake by the hands of the governor of the universe, Frederick the Second, the 5th of October, 1230:* so that the former must have been an infant to this Methusalem of a fish.

Pikes spawn in March or April, according to the coldness or warmth of the weather. When they are in high season their colors are very fine, being green, spotted with bright yellow; and the gills are of a most vivid and full red. When out of season, the green changes to grey, and the yellow spots turn pale.

The head is very flat; the upper jaw broad, and is shorter than the lower: the under jaw turns up a little at the end, and is marked with minute punctures.

The teeth are very sharp, disposed only in the front of the upper jaw, but in both sides of the lower, in the roof of the mouth, and often the tongue. The slit of the mouth, or the gape, is very wide; the eyes small.

The dorsal fin is placed very low on the back, and consists of twenty-one rays; the pectoral of fifteen; the ventral of eleven; the anal of eighteen.

The tail is bifurcated.

---

*Icones piscium, 316, where a print of the ring is given.
This fish which is found in many places, is known by the name of the Sea Needle. It comes in shoals on our coasts in the beginning of summer, and precedes the mackerel: it has a resemblance to it in taste, but the light green, which stains the back bone of this fish when boiled, gives many people a disgust to it.

The common sea pike, or sea needle, sometimes grows to the length of three feet, or more.

The jaws are very long, slender, and sharp pointed; the under extends much farther than the upper, and the edges of both are armed with numbers of short slender teeth: the inside of the mouth is purple: the tongue small: the eyes large: the irides silvery: the nostrils wide and round.

The body is slender: the belly quite flat, bounded on both sides by a rough line.
Class IV. SAURY PIKE.

The pectoral fins consist of fourteen rays; the ventral fin small, and placed very remote from the head, consists of seven rays, the first spiny.

The dorsal fin lies on the very lowest part of the back, consists of sixteen rays; the first are high, the others lower as they approach the tail; the anal fin is of the same form, and placed opposite to the other; and has twenty-one rays. The tail is much forked.

The colors are extremely beautiful when the fish is in the water: the back of a fine green, beneath that appears a rich changeable blue and purple: the sides and belly are of a fine silvery hue.

Saurus, Rondel. pis. 232. syn. pis. 169.
Skipper, Cornubiensium. Raii The Saury. Tour Scotland 1769.

The length is eleven inches: the nose slender: the jaws produced like those of the sea needle, but of equal length. The upper mandible a little incurvated. Their length one inch.

The eyes large; the body anguilliform: but towards the tail grows suddenly smaller, and tapers to a very inconsiderable girth. On the lower part of the back is a small fin, and between it and the tail six spurious like those of the mackerel. Correspondent to these, below are the anal fin and six spurious. The pectoral and ventral fins very small:
the tail much forked. The back dusky: the belly bright and silvery.

Great numbers of these fish were thrown ashore on the sands of Leith, near Edinburgh, after a great storm in November 1768. Rondeletius describes this species among the fish of the Mediterranean; but speaks of it as a rare kind.
ARGENTINE

ATHERINE
Teeth in the jaws and tongue.
Eight branchioptegous rays.
Vent near the tail.
The ventral fins composed of many rays.

Gesner pifc. 883? 

A LITTLE fish, which I believe to be of this species, was brought to me in 1769, taken in the sea near Downing.

The length was two inches one-fourth: the eyes large; and irides silvery. The lower jaw flopped much: the teeth small.

The body compressed, and of an equal depth almost to the anal fin. The tail forked.

The back was of a dusky green: the sides and covers of the gills as if plated with silver. The lateral line was in the middle and quite strait.

On each side of the belly was a row of circular punctures: above them another, which ceased near the vent.

Mr. Willughby says, that the outside of the air bladder of this fish consists of a foliaceous silvery skin, which was made use of in the manufacture of artificial pearl.

Y 4
The upper jaw a little flat.
Six branchioptegous rays.
A silvery stripe along the side.

This species is very common in the sea near Southampton, where it is called a Smelt. The highest season is from March to the latter end of May, or beginning of June; in which month it spawns. It never deserts the place; and is constantly taken except in hard frost. It is also found on other coasts of our island.

The length is above four inches one-fourth. The back straight: the belly a little protuberant. On the back are two fins. I neglected to count the rays. The tail is much forked.

The fish is semipellucid, covered with scales: the color silvery, tinged with yellow: the side line straight: beneath it is a row of small black spots.
Body and covers of the gills clothed with large scales.

Six incurvated branchioptegous rays.

Teeth on the tongue and in the palate only.

The mullet is justly ranked by Aristotle among the Pisces Littorales, or those that prefer the shores to the full sea: they are found in great plenty on several of the sandy coasts of our island, and haunt in particular those small bays that have influxes of fresh water. They come in great shoals, and keep rooting like hogs in the sand or mud, leaving their traces in form of large round holes. They are very cunning, and when surrounded with a net, the whole shoal frequently escapes by leaping over it, for when one takes the lead, the others are sure to follow: this circumstance is taken notice of by Oppian; whether the latter part of his observation is true, is what we are uncertain.
MULLET. CLASS IV.

The Mullet*, when encircling feines inclofe,
The fatal threads and treach'rous bosom knows.
Inflant he rallies all his vig'rous powers,
And faithful aid of every nerve implores;
O'er battlements of cork up-darted flies,
And finds from air th' escape that sea denies.
But should the first attempt his hopes deceive,
And fatal space th' imprison'd fall receive,
Exhausted strength no second leap supplies;
Self-doom'd to death the prostrate victim lies,
Refign'd with painful expectation waits,
'Till thinner elements compleat his fates.  Jones.

Oppian had good opportunity of examining these fish, for they swarm during some seafons on the coasts of the Mediterranean. Near Martegues, in the south of France, abundance of mullets are taken in weregs made of reeds placed in the shallows. Of the milts of the males, which are there called

* Mr. Jones, by mistake, translates it the Barbel.

Alletants,
Class IV. MULLET.

Allatants, and of the roes of the females, which are called Botar, is made Botargo. The materials are taken out entire, covered with salt for four or five hours, then pressed a little between two boards or stones, washed, and at last dried in the sun for thirteen or fourteen days.

This fish was sometimes made the instrument of a horrible punishment for unfortunate gallants. It was in use both at Athens and at Rome; but we doubt much whether it was a legal one: for we rather suspect it was inflicted instantaneously by the injured and enraged husband, at a season when

Furor arma ministrat.

Juvenal seems to speak of it in that light as well as Horace: the former, relating the revenge taken by the exasperated spouse, describes it as very various;

Necat hic ferro, secat ille cruentis
Verberibus, quo'sdam mæchos et Mugilis intrat.

The passage in Horace seems not to have been attended to by the critics; but when he mentions

* Mr. Willughby's notes during his travels. Vide Harris's Col. Voy. II. 721.
† Legibus Athenienium adulteri en ξεγν dépréhensæ pæna fuit ἑαυτονδων. Raphani loco utebantur nonnullam mugile pisce, interdum scorpione. Causauboni animadvers. in Athenœum, lib. I.
‡ Satyr. X. 316

the
the distresses that the invader of another's bed underwent, he most certainly alludes to this penalty:

_Discipet tunicâ fugiendum est, ac pede nudo; Ne nummi percant, aut Pyga, aut denique fama.*_

The mullet is an excellent fish for the table, but at present not a fashionable one.

The head is almost square, and is flat on the top: the nose blunt: lips thick. It has no teeth, only in the upper lip is a small roughness: between the eyes and the mouth is a hard callus.

The pupil of the eye is black, encircled with a small silvery line: the upper part of the iris is hazel; the lower silvery.

The form of the body is pretty thick, but the back not greatly elevated. The scales are large and deciduous.

The first dorsal fin is placed near the middle of the back, and consists of four strong spines; the second of nine soft branching rays; the pectoral has sixteen, the ventral six; the first a strong spine, the others soft.

The tail is much forked.

The color of the back is dusky, varied with blue and green: the sides silvery, marked with broad dusky parallel lines, reaching from head to tail: the belly is silvery.

* _Satyr. II. lib. I. 132._

Head
FLYING FISH.

No. 159.

ANCHOVY.

No. 163.
Head covered with scales.
Pectoral fins almost as long as the body.

Hirundo Plinii lib. IX. c. 26.
χελιδόν? Oppian II. 459.
Rondine. Salvian, 186.
Hirondelle de mer. Belon, 189.
Mugil alatus. Rondel. 267.

Gesner pisc. 553. Wil. Icth. 159. Wing-
Exocætus. Arted. synon. 18.
Exocætus volitans. E. abdo-
mine utrinque carinato.

WE can produce but a single instance of this
species † being taken on the British coasts.
In June 1765, one was caught at a small distance
below Caernarthen, in the river Towy, being
brought up by the tide which flows as far as the
town. It is a fish frequent enough in the Medi-
terranean, and also in the ocean, where it leads a
most miserable life. In its own element it is per-
petually harassed by the Dorados, and other fish of
prey. If it endeavors to avoid them by having re-
course to the air, it either meets its fate from the

* Pliny mentions it under the same name, lib. IX. c. 19.
† This fish was seen by John Strange, Esq; at Caernarthen,
who was so obliging as to communicate to me the account of it.
FLYING FISH. Class IV.

Gulls, or the Albatross, or is forced down again into the mouth of the inhabitants of water, who below keep pace with its aerial excursion. Neither is it unfrequent that whole shoals of them fall on board of ships that navigate the seas of warm climates: it is therefore apparent, that nature in this creature hath supplied it with instruments that frequently bring it into that destruction it strives to avoid, by having recourse to an element unnatural to it.

The antients were acquainted with this species: Pliny mentions it under the name of Hirundo, and speaks of its flying faculty. It is probable that Oppian intended the same by his Δνεια χειριδονες, or the swift swallow fish. What Athenaeus and the last cited author mean by the Εξουτος and Αδωνις, is not so evident: they assert it quitted the water and leapt on the rocks, from whence it tumbled with precipitation when disturbed by the unfriendly birds: on these accounts Ichthyologists seem to have made it synonymous with the flying fish.

Descrip.

It resembles the herring in form of the body, but the back is flat: the scales large and silvery: the dorsal fin is small, and placed near the tail: the pectoral fins, the instruments of flight, are almost as long as the body: the tail is bifurcated.

Eight
Eight branchioptegous rays.
The belly extremely sharp, and often ferrated.

Aringha ex cimbricus littoribus. Joannis, 143.
Herring. Schoneveld, 37.
Raii syn. p. 103.
Clupea maxilla inferiore longiore maculis carens. Arted.

synon. 14. α. β.
Clupea Harengus. Cl. immaculata, maxilla inferiore longiore. Lin. ffift. 522.
Sill. Faun. Suec. No. 357. α.

THE herring was unknown to the antients, notwithstanding the words ἱαρὰς and μασας, are by translators rendered Hælac†, the characters given of those fish are common to such numbers of different species, as render it impossible to say which they intended.

Herrings are found from the highest northern latitudes yet known, as low as the northern coasts of France; and excepting one instance brought by

* The herring of the Baltic, in all respects is like ours, but smaller.
† Which word, in spite of all lexicographers, never signified any thing but the garum or pickle. Vide p. 221.
HERRING. CLASS IV.

Dodd*, of a few being once taken in the Bay of Tangier, are never found more southerly.

They are met with in vast shoals on the coast of America, as low as Carolina. In Chesapeake Bay is an annual inundation of those fish, which cover the shores in such quantities as to become a nuisance†. We find them again in the seas of Kamtschatka, and possibly they reach Japan; for Kämpfer mentions, in his account of the fish of that country, some that are congeneric.

The great winter rendezvous of the herring is within the Arctic circle: there they continue for many months in order to recruit themselves after the fatigue of spawning, the seas within that space swarming with infect food, in a degree far greater than in our warmer latitudes.

This mighty army begins to put itself in motion in the spring; we distinguish this vast body by that name, for the word herring is derived from the German, Heer, an army, to express their numbers.

They begin to appear off the Shetland isles in April and May; these are only forerunners of the grand shoal which comes in June, and their appearance is marked by certain signs by the numbers of birds, such as gannets, and others which follow to prey on them: but when the main body approaches, its breadth and its depth is such as to

* Natural Hist. of the Herring, p. 27.
† Cat. of Carol. II. XXXIII.
alter the appearance of the very ocean. It is divided into distinct columns of five or six miles in length, and three or four in breadth, and they drive the water before them with a kind of rippling: sometimes they sink for the space of ten or fifteen minutes, then rise again to the surface, and in bright weather reflect a variety of splendid colors, like a field of the most precious gems, in which, or rather in a much more valuable light, should this stupendous gift of Providence be considered by the inhabitants of the British isles.

The first check this army meets in its march southward, is from the Shetland isles, which divide it into two parts; one wing takes to the east, the other to the western shores of Great Britain, and fill every bay and creek with their numbers; others pass on towards Yarmouth, the great and antient mart of herrings; they then pass through the British channel, and after that in a manner disappear. Those which take to the west, after offering themselves to the Hebrides, where the great stationary fishery is, proceed towards the north of Ireland, where they meet with a second interruption, and are obliged to make a second division; the one takes to the western side, and is scarce perceived, being soon lost in the immensity of the Atlantic; but the other, which passes into the Irish sea, rejoices and feeds the inhabitants of most of the coasts that border on it.

These brigades, as we may call them, which are thus
thus separated from the greater columns, are often capricious in their motions, and do not shew an invariable attachment to their haunts. We have had in our time instances of their entirely quitting the coasts of Cardiganshire, and visiting those of Caernarvonshire and Flintshire, where they continued for a few years, but in the present year have quite deserted our sea, and returned to their old seats. The season of their appearance among us was very late, never before the latter end of November; their continuance till February.

Were we inclined to consider this partial migration of the herring in a moral light, we might reflect with veneration and awe on the mighty Power which originally impressed on this most useful body of his creatures, the instinct that directs and points out the course, that blesses and enriches these islands, which causes them at certain and invariable times to quit the vast polar deeps, and offer themselves to our expecting fleets. That benevolent Being has never, from the earliest records, been once known to withdraw this blessing from the whole, though he often thinks proper to deny it to particulars; yet this partial failure (for which we see no natural reason) should fill us with the most exalted and grateful sense of his Providence, for impressing so invariable and general instinct on these fish towards a southward migration, when the whole is to be benefited, and to withdraw it only when a minute part is to suffer.

This
This instinct was given them, that they might remove for the sake of depositing their spawn in warmer seas, that would mature and vivify it more assuredly than those of the frigid zone. It is not from defect of food that they set themselves in motion, for they come to us full of fat, and on their return are almost universally observed to be lean and miserable. What their food is near the pole, we are not yet informed; but in our seas they feed much on the *Oniscus Marinus*, a crustaceous insect, and sometimes on their own fry. The herring will rise to a fly. Mr. Low of Birfa in the Orkneys assures me, that he has caught many thousands with a common trout fly, in a deep hole in a rivulet, into which the tide flows. He commonly went at the fall of the tide. They were young fish, from six to eight inches in length.

They are in full roe the end of June, and continue in perfection till the beginning of winter, when they begin to deposit their spawn. The young herrings begin to approach the shores in July and August, and are then from half an inch to two inches long: those in Yorkshire are called *Herring Sile*. Though we have no particular authority for it, yet as very few young herrings are found in our seas during winter, it seems most certain that they must return to their parental haunts beneath.

*The Suedes and Danes call the old herring *Sill*; but the people of *Sleswick*, from whence the Anglo-Saxons came, call the fry *Slyen.*
the ice, to repair the vast destruction of their race during summer, by men, fowl, and fish. Some of the old herrings continue on our coasts the whole year: the Scarborough fishermen never put down their nets but they catch a few; but the numbers that remain are not worth mention in comparison to the numbers that return.

Descrip. Herrings vary greatly in size. Mr. Travis communicated to me the information of an experienced fisher, who informed him that there is sometimes taken near Yarmouth, a herring distinguished by a black spot above the nose; and that he once saw one that was twenty-one inches and an half long. He insisted that it was a different species, and varied as much from the common herring as that does from the pilchard. This we mention in order to incite some curious person on that coast to a farther enquiry.

The eye is very large: the edges of the upper jaw and the tongue are very rough, but the whole mouth is void of teeth: the gill covers are very loose, and open very wide; which occasions the almost instant death of the herring when taken out of the water, which is well known, even to a proverb.

The dorsal fin consists of about seventeen rays, and is placed beyond the centre of gravity, so that when the fish is suspended by it, the head immediately dips down: the two ventral fins have nine rays;
Class IV. Herring.

rays; the pectoral seventeen; the anal fourteen: the tail is much forked.

The lateral line is not apparent, unless the scales are taken off: the sides are compressed: the belly sharply carinated, but the ridge quite smooth, and not in the left serrated.

The scales are large, thin, and fall off with a slight touch.

The color of the back and sides green, varied with blue: the belly silvery.

The herring fishery is of great antiquity: the industrious Dutch first engaged in it about the year 1164: they were in possession of it for several centuries, but at length its value became so justly to be known, that it gave rise to most obstinate and well-disputed wars between the English and them; but still their diligence and skill gives them a superiority over us in that branch of trade.

Our great stations are off the Shetland and Western Isles, and off the coast of Norfolk, in which the Dutch also share. Yarmouth has long been famous for its herring fair*; that town is obliged, by its charter, to send to the sheriffs of Norwich one hundred herrings, to be made into twenty-four pies, by them to be delivered to the lord of the manor of East Carleton, who is to convey them to the

---

* This fair was regulated by an act, commonly called the Statute of Herrings, in the 31st year of Edward III.
HERRING. Class IV, king *. The facetious Doctor Fuller † takes notice of the great repute of Norfolk was in for this fish, and, with his usual archness, calls a red herring, a Norfolk Capon.

In 1195, Dunwich in Suffolk accounted to the king for their yearly fee farm rent, £120, 1 mark, and 24000 herrings, 12000 for the monks of Eye, and 12000 for those of Ely.

The Dutch are most extravagantly fond of this fish when it is pickled. A premium is given to the first boats that arrives in Holland with a lading of this their ambrosia, and a vast price given for each keg. We have been in the country at that happy minute, and observed as much joy among the inhabitants on its arrival, as the Egyptians shewed on the first overflowing of the Nile. Flanders had the honor of inventing the art of pickling herrings. One William Beukelen, of Biervlet, near Sluys, hit on this useful expedient: from him was derived the name pickle, which we borrow from the Dutch and German. Beukelen died in 1397. The emperor Charles V. held his memory in such veneration for the service he did mankind, as to do his tomb the honor of a visit. It is very singular that most nations give the name of their favorite dish to the facetious attendant on every mountebank. Thus the Dutch call him Pickle

* Cambden Britan. I. 458.  † Britifb Worthies, 238.
Class IV. PILCHARD.

HERRING; the Italians, Macaroni; the French, Jean Pottage; the Germans, Hans Wurst*; and we dignify him with the title of Jack Pudding.


THE pilchard appears in vast shoals off the Cornish coasts about the middle of July, disappearing the beginning of winter, yet sometimes a few return again after Christmas. Their winter retreat is the same with that of the herring, and their motives for migrating the same. They affect, during summer, a warmer latitude, for they are not found in any quantities on any of our coasts except those of Cornwall, that is to say, from Fowey harbor to the Scilly isles, between which places the shoals keep shifting for some weeks.

The approach of the pilchard is known by much the same signs as those that indicate the arrival of the herring. Persons, called in Cornwall Huers, are placed on the cliffs, to point to the boats stationed off the land the course of the fish. By the 1st of James I. c. 23, fishermen are empowered to

* That is, Jack Sausage.
go on the grounds of others to *hue*, without being liable to actions of trespass, which before occasioned frequent lawsuits.

The emoluments that accrue to the inhabitants of that county are great, and are best expressed in the words of Doctor *W. Borlace*, in his account of the *Pilchard* fishery.

"It employs a great number of men on the sea, training them thereby to naval affairs; employs men, women, and children, at land, in salting, pressing, washing, and cleaning, in making boats, nets, ropes, casks, and all the trades depending on their construction and sale. The poor is fed with the offals of the captures, the land with the refuse of the fish and salt, the merchant finds the gains of commission and honest commerce, the fisherman the gains of the fish. Ships are often freighted hither with salt, and into foreign countries with the fish, carrying off at the same time part of our tin. The usual produce of the number of hogheads exported each year, for ten years, from 1747 to 1756 inclusive, from the four ports of Fawy, Falmouth, Penzance, and St. Ives, it appears that Fawy has exported yearly 1732 hogheads; Falmouth, 1463½ hogheads and two-thirds; Penzance and Mounts-Bay, 12149 hogheads and one-third; St. Ives, 1282 hogheads: in all amounting to 29795 hogheads. Every hoghead for ten years last past, together with the bounty allowed for each hoghead exported,
Class IV. PILCHARD.

"ported, and the oil made out of each hogshead, " has amounted, one year with another at an a- "verage, to the price of one pound thirteen shil- "lings and three-pence; so that the cash paid for "pilchards exported has, at a medium, annually "amounted to the sum of forty-nine thousand five "hundred and thirty-two pounds ten shillings."

The numbers that are taken at one shooting out of the nets, is amazingly great. Dr. Borlase assured me, that on the 5th of October, 1767, there were at one time inclosed in St. Ives's Bay 7000 hogs- heads, each hogshead containing 35000 fish, in all 245000000.

This fish has a general likeness to the herring, but differs in some particulars very essentially; we therefore describe it comparatively with the other, having one of each species before us, both of them of the same length, viz. nine inches and an half.

The body of the pilchard is less compressed than that of the herring, being thicker and rounder: the nose is shorter in proportion, and turns up: the under jaw is shorter.

The back is more elevated: the belly less sharp: the dorsal fin of the pilchard is placed exactly in the centre of gravity, so that when taken up by it, the body preserves an equilibrium, whereas that of the herring dips at the head: the dorsal fin of the pilchard we examined, being placed only three inches eight tenths from the tip of the nose; that of the herring four inches one tenth.

The
The scales of the pilchard adhere very closely, whereas those of the herring very easily drop off.

The pilchard is in general less than the herring; the specimen we describe being a very large one.

The pilchard is fatter, or more full of oil.

Mr. Willughby and Mr. Ray were of opinion, that these fish were the fry of the herring: we are induced to dissent from them, not only because on comparing a sprat and young herring of equal size, we discovered some specific differences, but likewise for another reason: the former visit our coasts, and continue with us in shoals innumerable, when the others in general have retired to the great northern deeps.

They come into the river Thames, below bridge, the beginning of November, and leave it in March, and are, during their season, a great relief to the poor of the capital.

At Gravesend, and at Yarmouth, they are cured like red herrings; they are sometimes pickled, and are little inferior in flavor to the Anchovy, but the bones
bones will not dissolve like those of the latter. Mr. Forster tells me, that in the Baltic they preserve them in the same manner, and call them Breitling, i.e. the little deep fish, as being deeper than the Stromling, or Baltic herring.

The sprat grows to about the length of five inches: the body is much deeper than that of a young herring of equal length: the back fin is placed more remote from the nose than that of the herring, and we think had sixteen rays. But one great distinction between this fish, the herring and pilchard, is the belly: that of the two first being quite smooth, that of the last most strongly serrated. Another is, that the herring has fifty six vertebrae; this only forty eight.

The true anchovies are taken in vast quantities in the Mediterranean, and are brought over here pickled. The great fishery is at Gorgona, a small isle west of Leghorn.

Mr. Ray discovered this species in the estuary of the
the *Dee* above a century ago*. Since that time no notice has been taken of it, till a few were taken near my house in 1769.

The length of the largest was six inches and an half: the body slender, but thicker in proportion than the herring.

The eyes were large: the irides white, with a cast of yellow: the under jaw much shorter than the upper: the teeth small; a row in each jaw, and another on the middle of the tongue. The tongue doubly ciliated on both sides. The dorsal fin consisted of twelve rays, was transparent, and placed nearer the nose than the tail.

The scales large and deciduous: back green and semipellucid: sides and belly silvery and opake: edge of the belly smooth: the tail forked.


Neither Aristotle, Athenaeus, nor Oppian, have described their *Ogovia* with such pre-

* Ray's Letters, 47.*
cision, as to induce us to translate it the Shad, without affixing to it our sceptic mark. Ausonius has been equally negligent in respect to his Alausa: all he tells us is, that it was a very bad fish:

\[ \text{Stridentesque focis obsonia plebis Alausas.} \]

\[ \text{Alausa crackling on the embers are} \]
\[ \text{Of wretched poverty, th' insipid fare.} \]

But commentators have agreed to render the \( \text{Opios} \) of the first, and the Alausa of the last, by the word Shad. Perhaps they were directed by the authority of Strabo, who mentions the \( \text{Opios} \) the supposed Shad, and the \( \text{Kersew} \), or Mullet, as fish that ascend the Nile at certain seasons, which, with the Dolphin* of that river, he says, are the only kinds that venture up from the sea for fear of the crocodile. That the two first are fish of passage in the Nile, is confirmed to us by Belonius†, and by Haffelquist‡. The last says it is found in the Mediterranean near Smyrna, and on the coast of Egypt, near Rosetto; and that in the months December and January it ascends the Nile, as high as Cairo: that it is stuffed with pot marjoram, and

*This is the Dolphin of the Nile, a fish now unknown to us. Pliny lib. VIII. c. 25. says, it had a sharp fin on its back, with which it destroyed the crocodile, by thrusting it into the belly of that animal, the only penetrable place.
†Belon. Iiim. 98.
when dressed in that manner will very nearly intox-icate the eater.

In *Great Britain* the *Severn* affords this fish in higher perfection than any other river. It makes its first appearance there in *May*, but in very warm seasons in *April*; for its arrival, sooner or later, depends much on the temper of the air. It continues in the river about two months, and then is succeeded by a variety which we shall have occasion to mention hereafter.

The *Severn* shad is esteemed a very delicate fish about the time of its first appearance, especially in that part of the river that flows by *Gloucester*, where they are taken in nets, and usually sell dearer than salmon; some are sent to *London*, where the fishmongers distinguish them from those of the *Thames*, by the *French* name of *Alosé*.

Whether they spawn in this river and the *Wye* is not determined, for their fry has not yet been ascertained. The old fish come from the sea into the river in full roe. In the months of *July* and *August*, multitudes of bleak frequent the river near *Gloucester*; some of them are as big as a small herring, and these the fishermen erroneously suspect to be the fry of the shad. Numbers of these are taken near *Gloucester* in those months only, but none of the emaciated shad are ever caught in their return *.

*Belon also observes, that none are taken in their return, on les prend en montant contre les rivieres, et jamais en descendant.*

The
The Thames shad does not frequent that river till the latter end of May or beginning of June, and is esteemed a very insipid coarse fish. The Severn shad is sometimes caught in the Thames, though rarely, and called Allis (no doubt Alose, the French name) by the fishermen, in that river. About the same time, and rather earlier, the variety called near Gloucester the Twait, makes its appearance, and is taken in great numbers in the Severn, and is held in as great disrepute as the shad of the Thames. The differences between each variety are as follow:

The true Shad weighs sometimes eight pounds, but their general size is from four to five.

The Twait, on the contrary, weighs from half a pound to two pounds, which it never exceeds.

The twaite differs from a small shad only in having one or more round black spots on the sides; if only one, it is always near the gill, but commonly there are three or four, placed one under the other.*

The other particulars agree in each so exactly, that the same description will serve for both.

The head slopes down considerably from the back, which at the beginning is very convex, and rather sharp: the body from thence grows gradually less to the tail.

* I must here acknowledge my obligations to Doctor Lysons, of Gloucester, for his communications relating to this fish, as well as to several other articles relating to those of the Severn.

The
SHAD.  Class IV.

The under jaw is rather longer than the upper: the teeth very minute.

The dorsal fin is placed very near the centre, is small, and the middle rays are the longest: the pectoral and ventral fins are small: the tail vastly forked: the belly extremely sharp, and most strongly serrated.

The back is of a dusky blue: above the gills begins a line of dark spots, which mark the upper part of the back on each side; the number of these spots is uncertain in different fish, from four to ten.
Class IV.

C A R P.

The mouth without teeth.
Three branchiostegous rays.
One dorsal fin.

* With bearded mouths.

IV. 8. VI. 40. VIII. 20. II. 30.
Raiua Burbuma. Salvian. 92.
La Carpe. Belon, 267.
Cyprinus. Rondel. fluviat. 150.
Geßner plic. 309.
Cyprinus nobilis, edle Karpe, Karpfe. Schonenwelda, 32.
plic. 115.

THIS is one of the naturalized fish of our country, having been introduced by Leonard Maschal, about the year 1514, to whom we were also indebted for that excellent apple the pepin. The many good things that our island wanted before that period, are enumerated in this old dichtich:

Turkies, carps, hops, pickerel, and beer,
Came into England all in one year. 

* Fuller’s Britifh Worthies, Sussex. 113.
† I inturf this note to shew that it was known here before.

The extract was made from the Boke of St. Albon’s printed at Westminster, by Wynkyn de Worde, in the year 1496. I think myself much obliged to Mr. Haworth, in Chancery-lane, not only for this but several other curious remarks.

‘ The carpe is a dayntous fishe, but there ben but fewe in ‘Englonde, and therfore I wytte the caiife of him. For he is ‘too 1ronge enarmyd in the mouthe that there may noo weke ‘harnays hold hym. And as touchyne his baytes, I have but ‘lyttel knoolege of it, and we were loth to wytte more than

Vol. III. A a

I know
Russia wants these fish at this day; Sweden has them only in the ponds of the people of fashion; Polish Prussia is the chief seat of the carp; they abound in the rivers and lakes of that country, particularly in the Frisch and Curisch-bass, where they are taken of a vast size. They are there a great article of commerce, and sent in well-boats to Sweden and Russia. The merchants purchase them out of the waters of the nobleffe of the country, who draw a good revenue from this article. Neither are there wanting among our gentry, instances of some who make good profit of their ponds.

The antients do not separate the carp from the sea fish. We are credibly informed that they are sometimes found in the harbor of Dantzick, between the town and a small place called Hela.

Carp are very long-lived. Gefner* brings an instance of one that was an hundred years old. They also grow to a very great size. On our own knowledge we can speak of none that exceeded twenty pounds in weight: but Jovius† says, that they were sometimes taken in the Lacus Larius (the Lago di Como) of two hundred pounds weight: and Rzaczyński † mentions others taken in the Dniester that were five feet in length.

* I know and have provyd. But well I wote that the redde worm, and the menow ben good baytyn for him at all tymes, as I have herd faye of persones credyble, and also founde wryten in bokes of credence.

† Hist. Nat. Poloniae, 142.
Class IV. CARP.

They are also extremely tenacious of life, and will live for a most remarkable time out of water. An experiment has been made by placing a carp in a net, well wrapped up in wet moss, the mouth only remaining out, and then hung up in a cellar, or some cool place: the fish is frequently fed with white bread and milk, and is besides often plunged into water. Carp thus managed have been known, not only to have lived above a fortnight, but to grow exceedingly fat, and far superior in taste to those that are immediately killed from the pond.*

The carp is a prodigious breeder: its quantity of roe has been sometimes found so great, that when taken out and weighed against the fish itself, the former has been found to preponderate. From the spawn of this fish Caviare is made for the Jews, who hold this sturgeon in abhorrence. We have forbore in this work to enter into minute calculations of the numbers each fish may produce. It has already been most skilfully performed by Mr. Harmer, and printed in the Philosophical Transactions of the year 1767. We shall, in our Appendix, take the liberty of borrowing such part of his tables of the fecundity of fish, as will demonstrate the kind attention of Providence, towards the

* This was told me by a gentleman of the utmost veracity, who had twice made the experiment. The same fact is related by that pious Philosopher Doctor Derham, in his Physico-Theology, edit. 9th. 1737, ch. 1. p. 7. n. e.
preferring so useful a class of animals for the service of its other creatures.

These fish are extremely cunning, and on that account are by some styled the river fox. They will sometimes leap over the nets, and escape that way; at others, will immerse themselves so deep in the mud, as to let the net pass over them. They are also very shy of taking a bait; yet at the spawning time they are so simple, as to suffer themselves to be tickled, handled, and caught by any body that will attempt it.

This fish is apt to mix its milt with the roe of other fish, from which is produced a spurious breed: we have seen the offspring of the carp and tench, which bore the greatest resemblance to the first: have also heard of the same mixture between the carp and bream.

Descrip.

The carp is of a thick shape: the scales very large, and when in best season of a fine gilded hue.

The jaws are of equal length; there are two teeth in the jaws, or on the tongue; but at the entrance of the gullet, above and below, are certain bones that act on each other, and comminute the food before it passes down.

On each side of the mouth is a single beard; above those on each side another, but shorter: the dorsal fin extends far towards the tail, which is a little bifurcated; the third ray of the dorsal fin is very strong, and armed with sharp teeth, point-
ing downwards; the third ray of the anal fin is constructed in the same manner.

Barbus. *Aufonius Mofella*, 94.
Barbeau. *Belon*, 299.
Barbus, Barbo. *Salvian*, 86.
*Gefner pifc.* 123.
Barbel. Wil. *Ictb.* 259.
*Ralii fyn. pifc.* 121.
Cyprinus oblongus, maxilla superiore longiore, cirris quatuor, pinna ani officu-
lorum septem. *Artes. fyn-
on* 8.
Cyprinus Barbus. *C. pinna ani radiis 7. cirris 4. pinna dorfi radio secundo utrine-
que ferrato. Lin. *fyst.* 525.

**This fish was so extremely coarse, as to be overlooked by the antients till the time of *Aufonius*, and what he says is no panegyrice on it; for he lets us know it loves deep waters, and that when it grows old it was not absolutely bad.**

*Laxos exerces Barbe natatus,
Tu melior pejore evvo, tibi contigit uni
Spirantum ex numero non inaudata senectus.*

It frequents the still and deep parts of rivers, and lives in society, rooting like swine with their noses in the soft banks. It is so tame as to suffer itself to be taken with the hand; and people have been known to take numbers by diving for them. In summer they move about during night in search...
of food, but towards autumn, and during winter, confine themselves to the deepest holes.

They are the worst and coarsest of fresh water fish, and seldom eat but by the poorer sort of people, who sometime boil them with a bit of bacon to give them a relish. The roe is very noxious, affecting those who unwarily eat of it with a nausea, vomiting, purging, and a slight swelling.

**Descrip.** It is sometimes found of the length of three feet, and eighteen pounds in weight: it is of a long and rounded form: the scales not large.

Its head is smooth: the nostrils placed near the eyes: the mouth is placed below: on each corner is a single beard, and another on each side the nose.

The dorsal fin is armed with a remarkable strong spine, sharply serrated, with which it can inflict a very severe wound on the incautious handler, and even do much damage to the nets.

The pectoral fins are of a pale brown color; the ventral and anal tipped with yellow: the tail a little bifurcated, and of a deep purple: the side line is strait.

The scales are of a pale gold color, edged with black: the belly is white.
TINCA.  

THE tench underwent the same fate with the barbel, in respect to the notice taken of it by the early writers; and even Aufonius, who first mentions it, treats it with such disrespect, as evinces the great capriciousness of taste; for that fish, which at present is held in such good repute, was in his days the repast only of the Canaille.

Quis non et virides vulgi solatia Tincas Norit?

It has been by some called the Physician of the fish, and that the slime is so healing, that the wounded apply it as a styptic. The ingenious Mr. Diaper, in his piscatory ecloges, says, that even the voracious pike will spare the tench on account of its healing powers:

A a 4.  

The
T E N C H.  C l a s s  I V.

The Tench he spares a medicinal kind:
For when by wounds distrest, or sore disease,
He courts the salutary fish for ease;
Close to his scales the kind physician glides,
And sweats a healing balsam from his sides.*

Whatever virtue its slime may have to the inhabitants of the water, we will not vouch for, but its flesh is a wholesome and delicious food to those of the earth. The Germans are of a different opinion. By way of contempt, they call it Shoemaker. Gesner even says, that it is insipid and unwholesome.

It does not commonly exceed four or five pounds in weight, but we have heard of one that weighed ten pounds; Salvianus speaks of some that arrived at twenty pounds.

They love still waters, and are rarely found in rivers: they are very foolish, and easily caught.

The tench is thick and short in proportion to its length: the scales are very small, and covered with slime.

The irides are red: there is sometimes, but not always, a small beard at each corner of the mouth.

The color of the back is dusky; the dorsal and ventral fins of the same color: the head, sides, and belly, of a greenish cast, most beautifully mixed with gold, which is in its greatest splendor when the fish is in the highest season.

* Ecl. II.
Class IV. Gudgeon.

The tail is quite even at the end, and very broad.

Gobio, Aufonius Mosella, 132.
Gobio fluviatillus. Salvian, 214.
Goujon de riviere. Belon, 322.
Gudgeon. Wil. Ichb. 264.

Aristotle mentions the gudgeon in two places; once as a river fish, and again as a species that was gregarious: in a third place he describes it as a sea fish; we must therefore consider the 

Cyprinus quinuncialis macrolohus, maxilla superiore longiore cirris duobus ad os. 
Arted. synon. 2.

Cyprinus pinna ani radiis 2.

This fish is generally found in gentle streams, and is of a small size: those few, however, that are caught in the Kennet, and Cole, are three times the weight of those taken elsewhere. The largest we ever heard of was taken near Uxbridge, and weighed half a pound.

They bite eagerly, and are assembled by raking the bed of the river; to this spot they immediately crowd in shoals, expecting food from this disturbance.

* The gudgeon is enumerated among the Syrian fish, by Dr. Raffel, p. 75.
The shape of the body is thick and round: the irides tinged with red: the gill covers with green and silver: the lower jaw is shorter than the upper: at each corner of the mouth is a single beard: the back olive, spotted with black: the side line strait: the sides beneath that silvery: the belly white.

The tail is forked; that, as well as the dorsal fin, is spotted with black.

** Without Beards.**

THE bream is an inhabitant of lakes, or the deep parts of still rivers. It is a fish that is very little esteemed, being extremely insipid.

It is extremely deep, and thin in proportion to its length. The back rises very much, and is very sharp at the top. The head and mouth are small:
on some we examined in the spring, were abundance of minute whitish tubercles; an accident which Pliny seems to have observed befalls the fish of the Lago Maggiore, and Lago di Como*. The scales are very large: the sides flat and thin.

The dorsal fin has eleven rays, the second of which is the longest: that fin, as well as all the rest, are of a dusky color; the back of the same hue: the sides yellowish.

The tail is very large, and of the form of a crescent.


**T**his fish is found in the Charwell, near Oxford, in the Witham in Lincolnshire, and in the fens in Holderness.

* Duo Lacus Italici in radicibus Alpium, Larius et Verbanus appellantur, in quibus pisces omnibus annis Vergiliarum ortu exsunt, squamis conspicui crebris atque praecutis, clavorum caligarium effigie: nec amplius quam circa eum mensem, visuntur. lib. IX. c. 18. Its
CRUCIAN. Class IV.

Its body is extremely deep, like that of the bream, but much thicker.

Descrip.

The head is small: the irides yellow, varying in some almost to redness: the nostrils large: the back vastly arched, and sloping off suddenly to the head and tail: the scales very large: the side line very slightly incurvated.

The dorsal fin consists of eleven rays; the first very short, the second very strong, and serrated on each side. The pectoral fins consist of seventeen; the ventral of nine; the anal of thirteen rays.

The back is of an olive color: the sides and belly of a gold color, with certain marks of red; the ventral and anal fins, and the tail, generally of a deep red: the tail forked.

We believe this to be the same with the Shallow of the Cam; which grows to the length of thirteen inches. It spawns in April.


THIS species is common in many of the fish ponds about London, and other parts of the south of England; but I believe is not a native fish. It
It is very deep and thick: the back is much arched: the dorsal fin consists of nineteen rays; the two first strong and serrated. The pectoral fins have (each) thirteen rays; the ventral nine; the anal seven or eight: the lateral line parallel with the belly: the tail almost even at the end.

The color of the fish in general is a deep yellow: the meat is coarse, and little esteemed.

Rutilus five Rubellus Fluviatilis. Gesner pis. 820.
Rottage. Schonevelda, 63.
Roche. Wil. Ich. 262.
Iride pinnis ventralibus ac ani plerumque rubentibus. Arted. synon. 9, 10.

SOUND as a Roach, is a proverb that appears to be but indifferently founded, that fish being not more distinguished for its vivacity than many others; yet it is used by the French as well as us, who compare people of strong health to their Gardon, our roach.

It is a common fish, found in many of our deep still rivers, affecting, like the others of this genus, quiet waters. It is gregarious, keeping in large shoals. We have never seen them very large.
Old Walton speaks of some that weighed two pounds. In a lift of fish sold in the London markets, with the greatest weight of each, communicated to us by an intelligent fishmonger, is mention of one whose weight was five pounds.

The roach is deep, but thin, and the back is much elevated, and sharply ridged: the scales large, and fall off very easily. Side line bends much in the middle towards the belly.

THIS, like the roach, is gregarious, haunts the same places, is a great breeder, very lively, and during summer is very fond of frolicking near the surface of the water. This fish and the roach are coarse and insipid meat.

Its head is small: the irides of a pale yellow: the body long and slender: its length seldom above ten inches, though in the abovementioned lift is an account of one that weighed a pound and an half: the scales smaller than those of the roach.

The
The back is varied with dusky, with a cast of yellowish green: the sides and belly silvery: the dorsal fin dusky: the ventral, anal, and caudal fins red, but less so than those of the former: the tail is very much forked.

The Graining. *Voy. to the Hebrides, ii.*

*The Graining* is found in the Mersey near Warrington: has much the resemblance of a dace, but is more slender, and the back straiter. The usual length about seven inches and a half. The depth to the length of this is as one to five, of the dace as one to four. The color of the back is silvery, with a bluish cast. The eyes, ventral, and anal fins are red, but paler than those of the dace. The pectoral fin redder.
SALVIANUS imagines this fish to have been the Squalus* of the antients, and grounds his opinion on a supposed error in a certain passage in Columella and Varro, where he would substitute the word Squalus instead of Scarus: Columella says no more than that the old Romans payed much attention to their stews, and kept even the sea fish in fresh water, paying as much respect to the Mullet and Scarus as those of his days did to the Murana and Bass.

That the Scarus was not our Chub, is very evident; not only because the Chub is entirely an inhabitant of fresh waters, but likewise it seems improbable that the Romans would give themselves

* A cartilaginous fish, a shark. Vide Plin. lib. IX. c. 24. Ovid also ranks his Squalus with the sea fish.

Et Squalus, et tenui suffusus sanguine Mullus. Halieut. 147.
any trouble about the worst of river fish, when they neglected the most delicious kinds; all their attention was directed towards those of the sea: the difficulty of procuring them seems to have been the criterion of their value, as is ever the case with effete luxury.

The chub is a very coarse fish and full of bones: it frequents the deep holes of rivers, and during summer commonly lies on the surface, beneath the shade of some tree or bush. It is a very timid fish, sinking to the bottom on the least alarm, even at the passing of a shadow, but they will soon resume their situation. It feeds on worms, caterpillars, grasshoppers, beetles, and other coleopterous insects that happen to fall into the water; and it will even feed on cray-fish. This fish will rise to a fly.

This fish takes its name from its head, not only in our own, but in other languages: we call it Chub, according to Skinner, from the old English, Cop, a head; the French, Testard; the Italians, Capitone.

It does not grow to a large size; we have known some that weighed above five pounds, but Salvianus speaks of others that were eight or nine pounds in weight.

The body is oblong, rather round, and of a pretty equal thickness the greatest part of the way: the scales are large.

The irides silvery; the cheeks of the same color: the head and back of a deep dusky green:

Vol. III. B b sides
sides silvery, but in the summer yellow: the belly white: the pectoral fins of a pale yellow: the ventral and anal fins red: the tail a little forked, of a brownish hue, but tinged with blue at the end.

THE taking of these, Ausonius lets us know, was the sport of children,

Alburnos prædam puerilibus hamis.

They are very common in many of our rivers, and keep together in large shoals. These fish seem at certain seasons to be in great agonies; they tumble about near the surface of the water, and are incapable of swimming far from the place, but in about two hours recover, and disappear. Fish thus affected the Thames fishermen call mad bleaks. They seem to be troubled with a species of Gordius or hair-worm, of the same kind with those
Class IV. B L E A K.

those which Aristotle* says that the Ballerus and Tillo are infested with, which torments them so that they rise to the surface of the water and then die.

Artificial pearls are made with the scales of this fish, and we think of the dace. They are beat into a fine powder, then diluted with water, and introduced into a thin glass bubble, which is afterwards filled with wax. The French were the inventors of this art. Doctor Lister† tells us, that when he was at Paris, a certain artist used in one winter thirty hampers full of fish in this manufacture.

The bleak seldom exceeds five or six inches in length: their body is slender, greatly compressed sidewayes, not unlike that of the sprat.

The eyes are large: the irides of a pale yellow: the under jaw the longest: the lateral line crooked: the gills silvery: the back green: the sides and belly silvery: the fins pellucid: the scales fall off very easily: the tail much forked.

During the month of July there appear in the Thames, near Blackwall and Greenwich, innumerable multitudes of small fish, which are known to the Londoners by the name of White Bait. They are esteemed very delicious when fried with fine flour, and occasion, during the season, a vast resort of the lower order of epicures to the taverns contiguous to the places they are taken at.

* Hist. an. lib. VIII. c. 20.
† Journey to Paris, 142.
There are various conjectures about this species, but all terminate in a supposition that they are the fry of some fish, but few agree to which kind they owe their origin. Some attribute it to the shad, others to the sprat, the smelt, and the bleak. That they neither belong to the shad, nor the sprat, is evident from the number of branchiopterous rays, which in those are eight, in this only three. That they are not the young of smelts is as clear, because they want the pinna adiposa, or rayless fin; and that they are not the offspring of the bleak is extremely probable, since we never heard of the white bait being found in any other river, notwithstanding the bleak is very common in several of the British streams: but as the white bait bears a greater similarity to this fish than to any other we have mentioned, we give it a place here as an appendage to the bleak, rather than form a distinct article of a fish which it is impossible to class with certainty.

It is evident that it is of the carp or Cyprinus genus: it has only three branchiopterous rays, and only one dorsal fin; and in respect to the form of the body is compressed like that of the bleak.

Its usual length is two inches: the under jaw is the longest: the irides silvery, the pupil black: the dorsal fin is placed nearer to the head than to the tail, and consists of about fourteen rays: the side line is straight: the tail forked, the tips black.
The head, sides, and belly are silvery; the back tinged with green.

**Class IV.** M I N O W.

The head, sides, and belly are silvery; the back tinged with green.

This beautiful fish is frequent in many of our small gravelly streams, where they keep in shoals.

The body is slender and smooth, the scales being extremely small. It seldom exceeds three inches in length.

The lateral line is of a golden color: the back flat, and of a deep olive: the sides and belly vary greatly in different fish; in a few are of a rich crimson, in others bluish, in others white. The tail is forked, and marked near the base with a dusky spot.
173. Gold-Fish. Class IV.

Kingo, the Gold Fish. Kam-pfer Hist. Japan, I. 137
Kin-yu, five carpio auratus.

T H E S E fish are now quite naturalized in this country, and breed as freely in the open waters as the common carp.

They were first introduced into England about the year 1691, but were not generally known till 1728, when a great number were brought over, and presented first to Sir Mathew Dekker, and by him circulated round the neighborhood of London, from whence they have been distributed to most parts of the country.

In China the most beautiful kinds are taken in a small lake in the province of Che-Kyang. Every person of fashion keeps them for amusement, either in porcellane vessels, or in the small basons that decorate the courts of the Chinese houses. The beauty of their colors, and their lively motions, give great entertainment, especially to the ladies, whose pleasures, by reason of the cruel policy of that country, are extremely limited.

In form of the body they bear a great resemblance to a carp. They have been known in this island
Class IV. Goldfish.

Island to arrive at the length of eight inches; in their native place they are said * to grow to the size of our largest herring.

The nostrils are tubular, and form sort of appendages above the nose: the dorsal fin and the tail vary greatly in shape: the tail is naturally biser, but in many is tricid, and in some even quadrifid: the anal fins are the strongest characters of this species, being placed not behind one another like those of other fish, but opposite each other like the ventral fins.

The colors vary greatly; some are marked with a fine blue, with brown, with bright silver; but the general predominant color is gold of a most amazing splendor; but their colors and form need not be dwelt on, since those who want opportunity of seeing the living fish, may survey them expressed in the most animated manner, in the works of our ingenious and honest friend Mr. George Edwards.

* Du Halde, 316.
APPENDIX,
APPENDIX.

The late Bishop of Carlisle informed me that a tortoise was taken off the coast of Scarborough in 1748 or 1749. It was purchased by a family at that time there, and a good deal of company invited to partake of it. A gentleman, who was one of the guests, told them it was a Mediterranean turtle, and not wholesome: only one of the company eat of it, and it almost killed him, being seized with a dreadful vomiting and purging.

Since the printing of that article I have been favored with some very curious accounts of this reptile, which will give greater light into its natural history than I am capable of, from a most unphilosophical but invincible aversion to the whole genus. The facts that will appear in the following lines serve to confirm my opinion of its being an innoxious animal, and, I hope, will serve to free numbers
APPENDIX.

numbers from a panic that is carried to a degree of infelicity, and also to redeem it from a persecution which the unmerited ill-opinion the world has conceived, perpetually exposes it to.

The gentlemen I am principally indebted to for my informations are J. Arscott, Esq; of Tebott, in Devonshire, and Mr. Pitfield, of Exeter. Some of these accounts were addressed to Doctor Milles, Dean of Exeter; others to the worthy Prelate above-mentioned, to whom I owe these and many other agreeable correfpondencies; others again to myself.

Mr. Arscott's letters give a very ample history of the nature of the toad: they were both addressed to Doctor Milles, and both were the result of certain queries I proposed, which the former was so obliging as to give himself the trouble of anawering in a most satisfactory manner.

I shall firft take the liberty of citing Mr. Arscott's letter of September the 23d, 1768, which mentions some very curious particulars of this innocent reptile, which, for such a number of years, found an asylum from the good sense of a family which soared above all vulgar prejudices.

"It would give me the greatest pleasure to be able to inform you of any particulars worthy Mr. Pennant's notice, concerning the toad who lived so many years with us, and was so great a favorite. The greatest curiosity in it was its becoming so remarkably tame. It had frequented some steps
"steps before the hall-door some years before my acquaintance commenced with it, and had been admired by my father for its size (which was of the largest I ever met with) who constantly paid it a visit every evening. I knew it myself above thirty years, and by constantly feeding it, brought it to be so tame that it always came to the candle, and looked up as if expecting to be taken up and brought upon the table, where I always fed it with insects of all sorts: it was fondest of flesh maggots, which I kept in bran; it would follow them, and when within a proper distance, would fix its eye, and remain motionless for near a quarter of a minute, as if preparing for the stroke, which was an instantaneous throwing its tongue at a great distance upon the insect, which stuck to the tip by a glutinous matter: the motion is quicker than the eye can follow.

"I always imagined that the root of its tongue was placed in the fore part of its under jaw, and the tip towards its throat, by which the motion must be a half circle; by which, when its tongue recovered its situation, the insect at the tip would be brought to the place of deglution. I was confirmed in this by never observing any internal motion in its mouth, excepting one swallow the instant its tongue returned. Possibly I might be

* This rapid capture of its prey might give occasion to the report of its fascinating powers. Linnaeus says, Insecta in sauces fascino revocat. "mistaken
APPENDIX.

"mistaken, for I never dissected one, but contented myself with opening its mouth, and slightly inspecting it.

"You may imagine that a toad generally detested (altho' one of the most inoffensive of all animals) so much taken notice of and befriended, excited the curiosity of all comers to the house, who all desired to see it fed, so that even ladies so far conquered the horrors instilled into them by nurses, as to desire to see it. This produced innumerable and improbable reports, making it as large as the crown of a hat, &c. &c. This I hope will account for my not giving you particulars more worth your notice. When I first read the account in the papers of toads sucking cancerous breasts, I did not believe a word of it, not thinking it possible for them to suck, having no lips to embrace the part, and a tongue so oddly formed; but as the fact is thoroughly verified, I most impatiently long to be fully informed of all particulars relating to it."

Notwithstanding these accounts will serve to point out some errors I had adopted, in respect to this reptile in my first sheet, yet it is with much pleasure I lay before the public a more authentic history, collected from Mr. Arscott's second favor; the answer points out my queries, which it is needless to repeat.
In respect to the queries, I shall here give the most satisfactory answers I am capable of.

First, I cannot say how long my father had been acquainted with the toad before I knew it; but when I first was acquainted with it, he used to mention it as the old toad I've known so many years; I can answer for thirty-six years.

Secondly, No toads that I ever saw appeared in the winter season. The old toad made its appearance as soon as the warm weather came, and I always concluded it retired to some dry bank to repose till the spring. When we newly'd the steps I had two holes made in the third step on each, with a hollow of more than a yard long for it, in which I imagine it slept, as it came from thence at its first appearance.

Thirdly, It was seldom provoked: neither that toad (nor the multitudes I have seen tormented with great cruelty) ever shewed the least desire of revenge, by spitting or emitting any juice from their pimples. Sometimes upon taking it up it would let out a great quantity of clear water, which, as I have often seen it do the same upon the steps when quite quiet, was certainly its urine, and no more than a natural evacuation.

Fourthly, A toad has no particular enmity for the spider; he used to eat five or six with his millepedes (which I take to be its chief food) that I generally provided for it, before I found out that
that flesh maggots, by their continual motion, was the most tempting bait; but when offered it eat blowing flies and humble bees that come from the rat-tailed maggot in gutters, or in short any insect that moved. I imagine if a bee was to be put before a toad, it would certainly eat it to its cost; but as bees are seldom stirring at the same time that toads are, they can seldom come in their way, as they seldom appear after sun-rising, or before sun-set. In the heat of the day they will come to the mouth of their hole, I believe, for air. I once from my parlour window observed a large toad I had in the bank of a bowling-green, about twelve at noon, a very hot day, very busy and active upon the grass; so uncommon an appearance made me go out to see what it was, when I found an innumerable swarm of winged ants had dropped round his hole, which temptation was as irresistible as a turtle would be to a luxurious alderman.

Fifthly, Whether our toad ever propagated its species I know not, rather think not, as it always appeared well, and not lessened in bulk, which it must have done, I should think, if it had discharged so large a quantity of spawn as toads generally do. The females that are to propagate in the spring, I imagine, instead of retiring to dry holes, go into the bottom of ponds, and lay torpid among the weeds; for to my great surprize in the middle of the winter, having
having for amusement put a long pole into my pond, and twised it till it had gathered a large volume of weed, on taking it off I found many toads, and having cut some asunder with my knife, by accident, to get off the weed, found them full of spawn not thoroughly formed. I am not positive, but think there were a few males in March: I know there are thirty males to one female, twelve or fourteen of whom I have seen clinging round a female: I have often engaged her, and put her to a solitary male, to see with what eagerness he would seize her. They impregnate the spawn as it is drawn out in long

* Mr. John Hunter has assured me, that during his residence at Belleisle, he dissected some hundreds of toads, yet never met with a single female among them.

† I was incredulous as to the obstetrical offices of the male toad, but since the end is so well accounted for, and the fact established by such good authority, belief must take place.

Mr. Demours, in the Memoirs of the French Academy, as translated by Dr. Templeman, vol. I. 371. has been very particular in respect to the male toad, as acting the part of an Accoucheur; his account is curious, and claims a place here:

"In the evening of one of the long days in summer, Mr. Demours being in the King's garden perceived two toads coupled together at the edge of an hole, which was formed in part by a great stone at the top. Curiosity drew him to see what was the occasion of the motions he observed, when two facts equally new surprised him; the first was the extreme difficulty the female had in laying her eggs, insomuch that she did not seem capable..."
"long strings, like a necklace, many yards long, not in a large quantity of jelly, like frogs' spawn. "N. B. After having held a female some time in my hand, I have, to try if there was any smell, put my finger a foot under water to a male, who has immediately seized it, and stuck to it as firmly as if it was a female. Quere, Would they seize a finger or rag that had touched a cancerous ulcer? "Sixthly, of being delivered of them without some assistance. The second was, that the male was mounted on the back of the female, and exerted all his strength with his hinder feet in pulling out the eggs, whilst his fore-feet embraced her breast.

"In order to apprehend the manner of his working in the delivery of the female, the reader must observe, that the paws of these animals, as well those of the fore-feet as of the hinder, are divided into several toes, which can perform the office of fingers.

"It must be remarked likewise, that the eggs of this species of toads are included each in a membranous coat that is very firm, in which is contained the embryo; and that these eggs, which are oblong and about two lines in length, being fastened one to another by a short but very strong cord, form a kind of chaplet, the beads of which are distant from each other about the half of their length.

"It is by drawing this cord with his paw that the male performs the function of a midwife, and acquits himself in it with a dexterity that one would not expect from so lumpish an animal.

"The presence of the observer did not a little discompose the male; for some time he stopped short, and threw on "the
APPENDIX.

"Sixthly, Insects being their food, I never saw any toad shew any liking or dislike to any plant.*

"Seventhly, I hardly remember any persons taking it up except my father and myself: I do not know whether it had any particular attachment to us.

"Eighthly, In respect to its end, I answer this last quere. Had it not been for a tame raven, I make no doubt but it would have been now living; who one day seeing it at the mouth of its hole, pulled it out, and although I rescued it, pulled out one eye, and hurt it so, that notwithstanding its living a twelvemonth it never enjoyed itself,

"the curious impertinent a fixed look that marked his quietness and fear; but he soon returned to his work with more precipitation than before, and a moment after he appeared undetermined whether he should continue it or not. The female likewise discovered her uneasiness at the fight of the stranger, by motions that interrupted sometimes the male in his operation. At length, whether the silence and steady posture of the spectator had dissipated their fear, or that the cau was urgent, the male resumed his work with the same vigour, and successfully performed his function."

* This question arose from an assertion of Linnaeus, that the toad delighted in filthy herbs. Deliciatur Cotula, Aëtea, Stachyde foetidi. The unhappy deformity of the animal seems to be the only ground of this as well as another misrepresentation, of its conveying a poison with its pimples, its touch, and even its breath. Verrua ladecentes venenatae infusæ tātū, unbelītu.
itself, and had a difficulty of taking its food, "missing the mark for want of its eye; before "that accident had all the appearance of perfect "health."

What Mr. Pitfield communicated to me serves farther to evince the patient and pacific disposition of this poor animal. If I am thought to dwell too long on the subject, let it be considered, that those who have most unprovoked enemies, and fewest friends, claim the greatest pity, and warmest vindication. This reptile has undergone all sorts of scandal; one author makes it the companion of an atheist*; and Milton† makes the devil itself its inmate; in a word, all kind of evil passions have been bestowed on it: It is but justice therefore to say something in behalf of an animal that has of late had so many trials of its temper, from experiments occasioned by the new discovery of its cancer-fucking qualities. It has born all the handling, teizing, bagging, &c. &c. without the least sign of a vindictive disposition; but has even made itself a sacrifice to the discharge of its office: this I know from the result of much enquiry; would I could contradict what is asserted, of the inefficacy of the tryals made of them in the most horrible of diseales; for at this time I myself cannot bring one proof of the success. But I would not have any one

* A great toad was said to have been found in the lodgings of Vanini, at Toulouse. Vide Johnson's Shakespear.
† Paradise Lost.
one discouraged from the pursuit of the remedy. Heaven opens to us gradually its favors: the loadstone was for ages a mere matter of ignorant amaze at its attractive qualities: mercury was a supposed poison, and the terror of physicians: we now wonder at the powers of electricity, and are still but partially acquainted with its uses: the toad, the object of horror even in the most enlightened times, is found to be perfectly innocent; it has certainly contributed to the ease (and as has been said to the cure) of the unhappy cancered; let the following facts speak for themselves; they come from persons of undoubted veracity, and will sufficiently establish the truth of the beneficent qualities of this animal.

The first paper relating to it is very ingeniously drawn up by Mr. Pitfield, for the information of Doctor Littleton, Bishop of Carlisle (now happy) who immediately honored me with the copy.

Exon, August 29, 1768.

"Your lordship must have taken notice of a paragraph in the papers, with regard to the application of toads to a cancered breast. A patient of mine has sent to the neighborhood of Hungerford, and brought down the very woman on whom the cure was done. I have, with all the attention I am capable of, attended the operation
APPENDIX.

"operation for eighteen or twenty days, and am
"surprized at the phænomenon. I am in no ex-
"pectation of any great service from the applica-
"tion: the age, constitution, and thoroughly can-
"cerous condition of the person, being uncon-
"querable barriers to it. How an ail of that
"kind, absolutely local, in an otherwise found
"habit, and of a likely age, might be relieved, I
"cannot say. But as to the operation, thus
"much I can assert, that there is neither pain nor
"naufeousness in it. The animal is put into a
"linen bag, all but its head, and that is held to
"the part. It has generally instantly laid hold of
"the fouleft part of the fore, and sucked with
"greediness until it dropped off dead. It has
"frequently happened that the creature has swolen
"immensly, and from its agonies appeared to be
"in great pain. I have weighed them for several
"days together, before and after the application,
"and found their increase of weight, in the dif-
"ferent degrees, from a drachm to near an ounce.
"They frequently sweat exceedingly, and turn
"quite pale: sometimes they disgorge, recover, and
"become lively again. I think the whole scene
"is surprizing, and a very remarkable piece of na-
"tural history. From the constant inoffensiveness
"which I have observed in them, I almost question
"the truth of their poisonous spitting. Many peo-
"ple here expect no great good from the applica-
"tion of toads to cancers; and where the disorder
APPENDIX.

"is not absolutely local, none is to be expected;
"where it is, and seated in any part, not to be
"well come at for extirpation, I think it is hardly
"to be imagined, but that the having it fucked
"clean as often as you please, must give great
"relief. Every body knows, that dogs licking of
"fores cures them, which is, I suppose, chiefly by
"keeping them clean. If there is any credit to be
"given to history, poisons have been fucked out,

—Pallentia Vulnra lambit

Ore Venena trabens.

"are the words of Lucan on the occasion: if the
"people to whom these words are applied, did
"their cure by immediately following the injection
"of the poison, the local confinement of another
"poison brings the case to a great degree of simi-
"larity.

"I hope I have not tired your lordship with my
"long tale, as it is a true one, and in my appre-
hension a curious piece of natural history, I could
"not forbear communicating it to you. I own I
"thought the story in the papers to be an inven-
tion, and when I considered the instinctive prin-
ciple in all animals of self preservation, I was
"confirmed in my disbelief; but what I have re-
lated I saw, and all theory must yield to fact.
"It is only the Rubeta, the land toad, which has
"the property of fucking; I cannot find any the

C c 4
APPENDIX.

"left mention of the property in any one of the "old naturalists. My patient can bear to have "but one applied in twenty-four hours: the wo- "man who was cured had them on day and "night, without intermission, for five weeks. Their "time of hanging at the breast has been from one "to six hours."

The other is of a woman who made the ex- periment, which I give, as delivered to me from "undoubted authority.

About six years* ago a poor woman received a crush on her breast by the fall of a pail; a com- plaint in that part was the result.

Last year her disorder increased to an alarming degree; she had five wounds on her breasts, one exceeding large, from which fragments of bone worked out, giving her vast pain; and at the same time there was a great discharge of thin yellow matter; she was likewise reduced to a mere skele- ton.

All her left side and stomach was much swel- led; her fingers doughy and discolored.

On the 25th of September, 1768, the first toad was applied; between that and the 29th she used seven, and had that night better rest. She swallowed with greater ease, for before that time there was some appearance of tumor in her neck, and a difficulty of getting any thing down.

* i. e. from 1769.
October 16th, the patient better. It was thought proper as winter was coming on, and of course it would be very difficult to procure a number of toads, to apply more at a time, so three were put on at once. The swelling in the arm abated, and the woman's rest was good.

During these trials she took an infusion of *Water Parsnip* with *Pulvis Cornacchini*.

December 18th, continued to look ill, but finds herself better: two of the wounds were now healed. She was always most easy when the toads were fucking, of which she killed vast numbers in the operation.

January 1769. The last account that was received, informing that the patient was better.

The remarks made on the animals are these:

Some toads died very soon after they had sucked; others lived about a quarter of an hour, but some lived much longer: for example, one that was applied about seven o'clock sucked till ten, and died as soon as it was taken from the breast; another that immediately succeeded continued till three o'clock, but dropped dead from the wound, each swelled exceedingly, and turned of a pale color.

These toads did not seem to suck greedily, and would often turn their heads away; but during the time of fucking were heard to smack their lips like a young child,

As those reptiles are apt by their struggles to get out
APPENDIX.

out of the bag, the open end ought to be made with an open hem, that the string may run the more readily, and fasten tightly about the neck.

It would be improper to quit the subject without mentioning the origin of this strange discovery, which was owing to a woman near Hungerford, who labored under a cancerous complaint in her breast, which had long baffled all applications.

The account she gives of the manner in which she came by her knowledge is singular, and I may say apocryphal. She says of herself, that in the height of her disorder she went to some church where there was a vast crowd: on going into a pew, she was accosted by a strange clergyman, who, after expressing compassion for her situation, told her that if she would make such an application of living toads* as abovementioned, she would be well.

This dark story is all we can collect relating to the affair. It is our opinion that she stumbled upon the discovery by accident, and that having set up for a cancer doctress, she thought it necessary to

* I have been told that she not only made use of living toads, but permitted the dead ones to remain at her breast, by way of cataplasm, for some weeks.

I have been informed that the relation of this strange method of cure was brought over a few years ago by one of our foreign ministers; and that there is also notice taken of it in Wheeler's Travels.

amuse
amuse the world with this mysterious relation*. For it seems very unaccountable, that this unknown gentleman should express so much tenderness for this single sufferer, and not feel any for the many thousands that daily languish under this terrible disorder: would he not have made use of this invaluable nostrum for his own emolument, or at least, by some other means have found a method of making it public for the good of mankind?

Here I take leave of the subject, which I could not do without expressing my doubts, as to the method of the woman’s obtaining her information; but in respect to the authenticity of this newly-discovered property of the toad, facts establish it beyond dispute. Let the humane wish for speedy proofs of the efficacy; and for the satisfaction of the world, let those who are capable of giving indisputable proofs of the success, take the earliest opportunity of making the public acquainted with so interesting an affair.

‘I have now given without alteration the whole of the facts as stated in my former edition. They are too curious to be lost; as they may serve to

* Mr. Valentine Greatraks, who about the year 1664, persuaded himself that he could cure diseases, by stroking them out of the parts affected with his hand; and the famous Bridget Boflock, of Cheshire, who worked cures by virtue of her fasting spittle, both came by their art in a manner supernatural, but by faith many were made whole.
A P P E N D I X.

give to after-times a proof of the belief of the
age, and the fair tryal made of a most distasteful remedy in the most dreadful of complaints.'

This reminds me of another Welsh word that is explanatory of the customs of the antients, shewing their intent in the use of the plant Vervaine in their lustrations; and why it was called by Dioscorides Hierobotane, or the sacred plant, and esteemed proper to be hung up in their rooms.

The British name Cas gan Cythrawl, or the Devil's aversion, may be a modern appellation, but is likewise called Y Dderwen fendigaid, the holy oak, which evidently refers to the Druids groves.

Pliny informs us, that the Gauls used it in their incantations, as the Romans and Greeks did in their lustrations. Terence, in his Andria, shews us the Verbena was placed on altars before the doors of private houses in Athens; and from the same passage in Pliny*, we find the Magi were guilty of the most extravagant superstition about this herb. Strange it is that such a veneration should arise for a plant endued with no perceptible qualities; and stranger still it should spread from the farthest north to the boundaries of India. So general a consent, however, proves the custom arose before the different nations had lost all communication with each other.

* Lib. XXV. cap. 9.
APPENDIX.

Her Grace the Dutchess Dowager of Portland did me the honor of communicating the following species.

This is a new kind of Sucker found near Weymouth, which ought to be placed after No. 59, and may be called the

THE head is flat and tumid on each side.

The body taper.

The pectoral fins placed unusually high. It has only one dorsal fin, placed low, or near the tail.

The tail is even at the end.

The color of the head and body is of a fine pink: of the fins whitish. On each side of the engine of adherence on the belly, is a round black spot.

It is figured in Plate XXII. of the natural size.

Another will add a new genus to the British fish, being of that which Linnaeus calls Ophidium. It must find a place after the Launce, Sand Eel or Ammodytes, under the trivial name of

**This** was taken at the same place with the former. I have not at this time had opportunity of describing it, therefore am obliged to refer the reader to the writers above cited for the description.
APPENDIX.

No. II.

OF THE PROLIFICNESS OF FISH.

<table>
<thead>
<tr>
<th>Fish</th>
<th>Weight oz.</th>
<th>Weight dr.</th>
<th>Weight of Spawn grains</th>
<th>Faecundity</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carp</td>
<td>25</td>
<td>5</td>
<td>2571</td>
<td>203109</td>
<td>April 4</td>
</tr>
<tr>
<td>Codfish</td>
<td>12540</td>
<td></td>
<td></td>
<td>3686760</td>
<td>Dec. 23</td>
</tr>
<tr>
<td>Flounder</td>
<td>24</td>
<td>4</td>
<td>2200</td>
<td>1357400</td>
<td>March 14</td>
</tr>
<tr>
<td>Herring</td>
<td>5</td>
<td>10</td>
<td>480</td>
<td>36960</td>
<td>Oct. 25</td>
</tr>
<tr>
<td>Mackrel</td>
<td>18</td>
<td>0</td>
<td>1223\frac{1}{2}</td>
<td>546681</td>
<td>June 18</td>
</tr>
<tr>
<td>Perch</td>
<td>8</td>
<td>9</td>
<td>765\frac{1}{2}</td>
<td>28323</td>
<td>April 5</td>
</tr>
<tr>
<td>Pike</td>
<td>56</td>
<td>4</td>
<td>5100\frac{1}{2}</td>
<td>49304</td>
<td>April 25</td>
</tr>
<tr>
<td>Roach</td>
<td>10</td>
<td>6\frac{1}{2}</td>
<td>361</td>
<td>81586</td>
<td>May 2</td>
</tr>
<tr>
<td>Smelt</td>
<td>2</td>
<td>0</td>
<td>149\frac{1}{2}</td>
<td>38278</td>
<td>March 21</td>
</tr>
<tr>
<td>Sole</td>
<td>14</td>
<td>8</td>
<td>542\frac{1}{2}</td>
<td>100362</td>
<td>June 13</td>
</tr>
<tr>
<td>Tench</td>
<td>40</td>
<td>0</td>
<td></td>
<td>383252*</td>
<td>May 28</td>
</tr>
</tbody>
</table>

* Some part of the spawn of this fish was by accident lost, so that the account here is below the reality. Vide Phil. Trans. 1767.
APPENDIX.

No. III.

Of the method of making ISINGLASS in ICELAND, from the SOUNDS of COD and LING.

The sounds of cod and ling bear general likeness to those of the Sturgeon kind of Linnaeus and Artedi, and are in general so well known, as to require no particular description. The New-found land and Iceland fishermen split open the fish as soon as taken, and throw the back-bones, with the sounds annexed, in a heap; but previous to putrefaction, the sounds are cut out, washed from their slimes, and salted for use. In cutting out the sounds, the parts between the ribs are left behind, which are much the best; the Iceland fishermen are so sensible of this, that they beat the bones upon a block with a thick stick, till the Pockets, as they term them, come out easily, and thus preserve the sound entire. If the sounds have been cured with salt, that must be dissolved by steeping them in water, before they are prepared for Isinglaffs. The fresh sound must then be laid upon a block of wood, whose surface is a little elliptical, to the end of which a small hair brush is nailed,
APPENDIX.

nailed, and with a faw-knife, the membranes on each side of the sound must be scraped off. The knife is rubbed upon the brush occasionally, to clear its teeth, the pockets are cut open with scif-fars, and perfectly cleansed of the mucous matter with a coarse cloth: the sounds are afterwards washed a few minutes in lime-water, in order to absorb their oily principle; and lastly, in clear water. They are then laid upon nets, to dry in the air; but, if intended to resemble foreign Isinglefs, the sounds of cod will only admit of that called book, but those of ling both shapes. The thicker the sounds are, the better the Isinglefs, color excepted; but that is immaterial to the brewer, who is its chief consumer.
APPENDIX.

No. IV.

CATALOGUE OF THE ANIMALS DESCRIBED IN THIS VOLUME, WITH THEIR BRITISH NAMES.

REPTILES.

1. CORIACEOUS
Tortoise, Melwioges.
2. Common Frog, Llyffant melyn.
3. Edible Frog, Llyffant melyn cefn grwm.
4. Toad, Llyffant du, Llyffant daf-adenog.
5. Natter Jack.
6. Great Frog.
7. Scaly Lizard.
8. Warty Lizard, Genau goeg ddafadnog.
10. Little Lizard, leiaf.
11. Anguine Lizard, naredig.
13. Snake, Neidr fraith, Neidr y to-menyydd.

It is to Richard Morris, Esq. that the public is indebted for the British names.

14. Aber-
APPENDIX.


FISH.

17. Pike-headed Whale, Penhwyad.
18. Fin fish, Barfog.
23. High-finned, Uchel aden.
24. Dolphin, Dolfyn.
27. Lamprey, Sea, Llyfowen bendol, Llamprai.
29. Pride.
30. Skate, Cath fôr, morcath, Rhaiesta.
32. Rough Ray.
33. Fuller Ray.
34. Shagreen Ray.
35. Whip Ray.
APPENDIX.

37. Thornback, Morcath bigog.
38. Sting Ray, Morcath cefn.
39. Angel fish, Maelgi.
40. Picked Dog fish, Ci Pegod, Picewd.
41. Basking Shark.
42. White Shark, Morgi gwin.
43. Blue Shark, Morgi glas, y Sierc.
44. Long-tailed Shark, Llwynog mor.
45. Tope, Ci glas.
46. Spotted Dog fish, Ci ygarmes, morgi mawr.
47. Lesser Dog fish.
49. Porbeagle.
50. Beaumaris Shark.
51. Angler, common, Morlyffant.
52. Long Angler, Morlyffant hir.
53. Sturgeon, Iftwrision.
54. Oblong Diodon, Heulbylg.
55. Short Diodon.
56. Globe Diodon.
57. Lump Sucker, Jar-fôr.
58. Unctuous Sucker, Môr falwen.
59. Jura Sucker.
60. Longer Pipe fish.
61. Shorter.
62. Little, Mor Neidr.
63. Eel, Llysfowen.
64. Conger, Mor Llysfowen, Cyngyren.
65. Wolf
65. Wolf fish, 66. Launce, Morflaidd.
68. Sword fish, Morys.
70. Dragonet, fordid. Mor wiber, Pigyn aistrus.
71. Weever, Codsyn.
73. Common Cod fish, Cod lwyd.
74. Hadock, Deillian.
75. Whiting Pout, Cwdyn ebrill.
76. Bib, Chwetlyn glas.
77. Poor, Morlas.
78. Coal fish, Chwitlyn gwyn.
79. Pollack, Cegddu.
80. Whiting, Honos.
81. Hake, Llefen, Liefenan.
82. Forked Hake.
83. Left Hake.
84. Trisurcated Hake.
85. Ling, Honos.
86. Burbot, Llefen, Liefenan.
87. Three bearded Cod.
88. Five bearded Cod.
89. Torfk.
90. Crested Blenny.
91. Gattorugine.
92. Smooth Blenny.
93. Spotted
APPENDIX.

93. Spotted Blenny.
94. Viviparous Blenny.
95. Black Goby.
96. Spotted Goby.
98. Armed Bull Head, Penbwl.
99. Father Lasher.
100. Doree, Sion dori.
101. Opah.
102. Holibut, Lleden ffreinig.
103. Plaife, Lleden frech.
104. Flounder, Lleden 'ddu.
105. Dab, Lleden gennog, Lleden dwfr croyw.
106. Smear Dab,
107. Sole, Tafod yr hydd, Tafod yr ych.
108. Smooth Sole.
110. Pearl, Perl.
111. Whiff.
112. Gilt Head, Peneuryn, Eurben.
113. Red Gilt Head, Brôm y mór.
114. Toothed Gilt Head.
115. Wraffe, antient, Gwrach.
116. Ballan.
117. Bimaculated.
118. Trimaculated.
119. Striped.
120. Gibbous.
APPENDIX.

120. Gibbous.
121. Goldfinny.
122. Comber.
123. Cook.
124. Perch, common, Perc.
125. Basse, Draenog, Gannog.
126. Sea Perch.
127. Ruffe.
128. Black Ruffe.
129. Three spined Stickledack, Sil y dom, Pyfgod y gath.
130. Ten spined, Pigmowgysg.
131. Fifteen spined, Silod y mor.
132. Mackrel, common, Macrell.
133. Tunny, Macrell Sopaen.
134. Scad.
135. Red Surmullet, Hyrddyn coch.
136. Striped Surmullet.
137. Grey Gurnard, Penhaiarn Ilwyd, Penhaiernyn.
139. Piper, Pibyd.
140. Sapphirine Gurnard, Ysgyfarnog y mor.
141. Streaked Gurnard.
142. Loche, bearded, Crothell yr afon.
143. Salmon, Gleisiedyn, Eog, Maran Taliesin.
144. Grey, Penllwyd, Adfwich.
145. Sea Trout.

D d 4

146. Trout,
146. Trout.
147. White Trout.
148. Samlet,
149. Charr,
150. Grayling,
151. Smelt,
152. Gwiniad,
153. Pike,
154. Gar Pike,
155. Saury Pike.
156. Argentine.
157. Atherine.
158. Mullet,
159. Flying Fish.
160. Herring,
161. Pilchard,
162. Sprat,
163. Anchovy.
164. Shad,
165. Carp,
166. Barbel,
167. Tench,
168. Gudgeon,
169. Bream,
170. Rud,
171. Crucian.
172. Roach,
173. Dace,

Brithyll.
Brith y gro.
Torgoch.
Brithyll rheftrog, Glasganged.
Brwyniaid.
Gwiniedyn.
Penhwyd.
Môr nodwydd, Corn big.
Hyrddyn, Mingrwn.
Pennog, ysgaden.
Pennog mair.
Coeg Bennog.
Herlyn, Herling.
Carp, Cerpyn.
Barfbysg, y Barfog.
Gwrachen, Ifgretten.
Crothel.
Brém.
Rhuddgoch.
Rhyfell.
Darfen, Golenbysg.

APPENDIX.
APPENDIX.

175. Chub,
176. Bleak,
177. Minow,
178. Gold Fish.

APPENDIX.

179. Bimaculated Sucker.
180. Beardled's Ophidium.
INDEX.

A.

ABDOMINAL fish, 46, 282.
Adder, 123.
Adder-gems, their supposed virtues, 32.
Aloptes of Aristotle, a species of Shark, 110.
Anchovy, 347.
Angel-fish, 98.
its fierceness, 99.
Angler, common, 120.
long, 123.
Apieus, the chief of epicures, 272.
Apodal fish, 142.
Ape, 110.
ARGENTINE, 327.
Aristophanes, his chorus of frogs, 11.
Asinius Celer, the vast price he gave for a Surmullet, 272.
ATHERINE, 328.
INDEX.

Ballan, 246.
Barbel, 357.
—— its roe noxious, 358.
Basking Shark, the largest species, 101.
—— migratory, 102.
—— yields great plenty of oil, 104.
Basse, 257.
Bib, or Blinds, a kind of Cod fish, 184.
Billets, young Coal fish, 187.
Birdbolt, 199.
Biscayeners, early engaged in the whale fishery, 54.
Bleak, 370.
Blenny, the crested, 206.
—— smooth, 208.
—— spotted, 210.
—— viviparous, 211.
Blind-worm, or Slow-worm, ibid.
Boat, the five-men, what, 235.
Bony fish, 42, 142.
Botargo, what, 331.
Bottle-head, a sort of Whale, 59.
Branlines, wide Samlet.
Bream, 362.
—— sea, 242.
Bret, 233.
British names, 402.
Bufonites, what, 16, 154.
Bulcard, 208.
Bull-head, river, 216.
—— armed, 217.
Bull-
<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bull-trout</td>
<td>296</td>
</tr>
<tr>
<td>Burbot</td>
<td>199</td>
</tr>
<tr>
<td>Butterfish</td>
<td>210</td>
</tr>
<tr>
<td>But, a name for the Flounder</td>
<td>229</td>
</tr>
</tbody>
</table>

### C.

- the blunt-headed, *ibid.*
- round-headed, 63.
- high-finned, 64.

Cancers attempts to cure by the application of toads, 17.

**CARP**,
- its longevity, 353.
- very tenacious of life, 354.
- golden, 355.

**CARTILAGINOUS FISH**, their characters, 41, 75.

**CETACEOUS FISH**, their characters, 41, 47.

**Char**, 305.
- gilt and red, probably the same fish, 308.

**Chub**, 368.

**Coal-fish**, 186.

**Coble, a sort of boat**, 235.

**Cod-fish**, the common, 172.
- fish affecting cold climates, *ibid.*
- vast fishery off *Newfoundland*, 173.
- very prolific, 177.
- three bearded, 201.
- five bearded, 202.

**Conger, how differing from the eel**, 147.
- an article of commerce in *Cornwall*, 148.

**Comber**, 252.

*Cook,*
<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cook</td>
<td>253</td>
</tr>
<tr>
<td>Crucian</td>
<td>364</td>
</tr>
<tr>
<td>Dab</td>
<td>230</td>
</tr>
<tr>
<td>Dace, or Dare</td>
<td>ibid.</td>
</tr>
<tr>
<td>Digby, Sir Kenelm,</td>
<td>366</td>
</tr>
<tr>
<td>Diodon, oblong</td>
<td>129</td>
</tr>
<tr>
<td>Diodon, short</td>
<td>131</td>
</tr>
<tr>
<td>Diodon, globe</td>
<td>132</td>
</tr>
<tr>
<td>Dog-fish, the picked,</td>
<td>100</td>
</tr>
<tr>
<td>Dog-fish, greater</td>
<td>113</td>
</tr>
<tr>
<td>Dog-fish, lesser</td>
<td>115</td>
</tr>
<tr>
<td>Dolphin</td>
<td>65</td>
</tr>
<tr>
<td>Dolphin, venerated by</td>
<td>66</td>
</tr>
<tr>
<td>Dolphin, falsely</td>
<td>67</td>
</tr>
<tr>
<td>Dolphin, a dish</td>
<td>68</td>
</tr>
<tr>
<td>Doree</td>
<td>221</td>
</tr>
<tr>
<td>Dragonet, gemmeous</td>
<td>264</td>
</tr>
<tr>
<td>Dragonet, the fordid</td>
<td>167</td>
</tr>
<tr>
<td>Drizzles, what</td>
<td>198</td>
</tr>
<tr>
<td>Eel</td>
<td>142</td>
</tr>
<tr>
<td>Eel, common, will quit</td>
<td>143</td>
</tr>
<tr>
<td>Eel, impatient of</td>
<td>146</td>
</tr>
<tr>
<td>Eel, generation of</td>
<td>ibid.</td>
</tr>
<tr>
<td>Eel, most universal</td>
<td>ibid.</td>
</tr>
<tr>
<td>Eel, despised by the</td>
<td></td>
</tr>
<tr>
<td>Eel, Romans</td>
<td></td>
</tr>
</tbody>
</table>
# INDEX

<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eel-pout</td>
<td>199.</td>
</tr>
<tr>
<td>—— viviparous</td>
<td>211.</td>
</tr>
<tr>
<td>Eft, <em>vide</em> Lizard</td>
<td>415</td>
</tr>
<tr>
<td>Elvers</td>
<td>148.</td>
</tr>
</tbody>
</table>

## F

<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father-lasher</td>
<td>218.</td>
</tr>
<tr>
<td>Fin-fish, a species of whale</td>
<td>57.</td>
</tr>
<tr>
<td>Finscale, <em>vide</em> rud.</td>
<td>57.</td>
</tr>
<tr>
<td>Fish, the fourth class of animals</td>
<td>39.</td>
</tr>
<tr>
<td>Fishing-frog, <em>vide</em> angler.</td>
<td>57.</td>
</tr>
<tr>
<td>Flounder</td>
<td>226.</td>
</tr>
<tr>
<td>—— or fluke</td>
<td>229.</td>
</tr>
<tr>
<td>Flying-fish</td>
<td>333.</td>
</tr>
<tr>
<td>Forked beard, greater</td>
<td>193.</td>
</tr>
<tr>
<td>—— lesser</td>
<td>195.</td>
</tr>
<tr>
<td>Fox, sea</td>
<td>110.</td>
</tr>
<tr>
<td>Frog, common</td>
<td>9.</td>
</tr>
<tr>
<td>—— generation of the</td>
<td>10.</td>
</tr>
<tr>
<td>—— periodical silence</td>
<td>11.</td>
</tr>
<tr>
<td>—— edible</td>
<td>13.</td>
</tr>
<tr>
<td>—— great</td>
<td>20.</td>
</tr>
</tbody>
</table>

## G

<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garum, a sort of pickle much esteemed by the antients</td>
<td>265.</td>
</tr>
<tr>
<td>Gattorugin</td>
<td>207.</td>
</tr>
<tr>
<td>Gilt-head, lunulated, or gilt-poll</td>
<td>249.</td>
</tr>
<tr>
<td>—— red</td>
<td>242.</td>
</tr>
<tr>
<td>—— toothed</td>
<td>243.</td>
</tr>
</tbody>
</table>
INDEX.

Glain Neidr, in high esteem with the old Britons, 32.
Gloucester city, presents the King annually with a lam-
prey pce. 77.
Goby, the black, 213.
—— spotted, 215.
Goldfish, 374.
Goldfinny, 251.
Graining, 367.
Grampus, 72.
Grayling, 311.
Grey, 295.
Grigs, 145.
Groundling, vide Loche.
Gudgeon, 361.
—— sea, 213.
Guffer, 211.
Gurnard, grey, 276.
—— red, 278.
—— faphphrine, 280.
—— fhtreaked, 281.
—— yellow, vide Dragonet.
Gwiniad, 316.

H.

Hadock, 179.
—— vast shoals of, 181.
—— said to be the fish out of whose mouth St. Peter
took the tribute-money 182.
Hake, 191.
—— leffer, or forked-beard, 193.
—— left, or leffer forked-beard, 195.
—— trifurcated 196.
Henry
Henry I. killed by a surfeit of lampreys, 77.
Herring, 335.
——— its migrations, 336.
——— fishery, 341.
Hierobotane, account of that plant, 396.
Hippo, the dolphin of, 66.
Holibut, its vast size, 226.
——— voraciousness, 227.
Hull, the town of, early in the whale fishery, 55.

I.

Ichthyocolla, or Isinglass, 127.
——— method of making, 400.
Jugular fish, 44, 164.

K.

King-fish, 223.
Kit, a sort of dab, 230.

L.

Lamprey, 76.
——— not the muræna of the antients, 78.
——— its vast tenaciousness, ibid.
——— the lesser, 79.
Lampern, vide Pride.
Lantern-fish, or smooth sole, 232.
Launce, 156.
——— beardless, 398.
I N D E X.

Ling, — — — — 197.
— a great article of commerce, — ibid.
Lizard, scaly, — — — 21.
— — — warty, — — 23.
— — — brown, — — — 24.
— — — little, — — — 25.
— — — anguine, — — — ibid.
— — — green, — — — 22.
— — — a large kind, probably exotic, — ibid.
— — — larves of lizards, mostly inhabitants of water, 24.
Loche, bearded, — — — 232.
— — — sea, — — — 201.
Lump-fish, or sucker, — — — 133.
— — — much admired by the Greenlanders, — 135.

M.

Mackrel, — — — — 264.
— — — — horse, — — — 269.
Mefon, Mr. his spirited translation of Pliny's account of the ovum anguinum, — — 32.
Miller's thumb, — — — 216.
Minow, — — — 373.
Morris, — — — 158.
Mulgrancck, — — — 208.
Mullet, — — — — 329.
— — — the punishment of adulterers, — — 331.
Murana, not our lamprey, — — — 78.
Murianos of Aristotle, our whale, — — 50.
Musculus of Pliny, the same, — — 52.
Myxine, — — — 235.

N.
I N D E X.

N.

Natter-jack, a species of toad, — — 19.
Newt, vide Lizard.
Newfoundland, its bank, — — 173.
North-capers, vide Grampus.

O.

Ofber, an able navigator in K. Alfred's days, — 54.
Opah, — — 223.
Otter-pike, or leffer Weever, — — 171.
Ovum anguihum, a druidical bead, — — 32.

P.

Paddock-noon, what, — — 12.
Parrs, or young coal-fish, — — 187.
Pearl, — — 238.
Pearls, artificial, what made of, — — 371.
Perch, much admired by the antients, — — 254.
— a crooked variety found in Wales, — — 256.
— sea, — — 258.
Phyfeter, or blowing whale, — — 58.
Pike, — — 320.
— its longevity, — — 222.
— gar, or sea-needle, — — 324.
— faury, — — 325.
Pilchard, — — 343.
— its important fishery, — — 344.

E e z

Pipe-
<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe-fish, longer</td>
<td>138</td>
</tr>
<tr>
<td>—— shorter</td>
<td>140</td>
</tr>
<tr>
<td>—— little, or sea-adder</td>
<td>141</td>
</tr>
<tr>
<td>Piper</td>
<td>279</td>
</tr>
<tr>
<td>Plaife</td>
<td>228</td>
</tr>
<tr>
<td><em>Pliny</em>, his account of the <em>Ovum anguinum</em></td>
<td>31</td>
</tr>
<tr>
<td>Pogge</td>
<td>217</td>
</tr>
<tr>
<td>Pollack, the whiting</td>
<td>188</td>
</tr>
<tr>
<td>Poor, or power, a kind of codfish</td>
<td>185</td>
</tr>
<tr>
<td>Porbeagle, a species of shark</td>
<td>117</td>
</tr>
<tr>
<td>Porpoise, a royal dish</td>
<td>69</td>
</tr>
<tr>
<td>Pout, a species of codfish</td>
<td>183</td>
</tr>
<tr>
<td>Pride</td>
<td>80</td>
</tr>
</tbody>
</table>

Quin, Mr. the actor, first recommended the eating of the Doree in England, 222.

R.

<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ray</td>
<td>82</td>
</tr>
<tr>
<td>—— sharp nosed</td>
<td>83</td>
</tr>
<tr>
<td>—— rough</td>
<td>85</td>
</tr>
<tr>
<td>—— fuller</td>
<td>86</td>
</tr>
<tr>
<td>—— shagreen</td>
<td>87</td>
</tr>
<tr>
<td>—— whip</td>
<td>88</td>
</tr>
<tr>
<td>—— electric, its numbing quality</td>
<td>89</td>
</tr>
<tr>
<td>—— sting</td>
<td>95</td>
</tr>
<tr>
<td>—— the <em>Trygon</em> of the antients</td>
<td><em>ibid.</em></td>
</tr>
<tr>
<td>—— fables relating to it</td>
<td><em>ibid.</em></td>
</tr>
<tr>
<td>Reptiles, the third class of animals</td>
<td>1, 7 Roach</td>
</tr>
</tbody>
</table>
INDEX.

| Roach,                 | 365. |
| Rockling,              | 201. |
| Rud,                   | 363. |
| Ruffe,                 | 259. |
| — the black, or black fish of Mr. Jago, | 260. |

S.

| SALMON,                | 284. |
| —— leaps,              | 286. |
| —— fishery,            | 287. |
| —— trout, *vide* bull-trout, | |
| Samlet,                | 303. |
| Sand-eel, *vide* Launce, | |
| Scad,                  | 269. |
| Schelly, *vide* Gwiniad. | |
| *Scombraria*, an isle, why so called, | 265. |
| Scorpion, sea,         | 218. |
| Seneca, his account of the luxury of the Romans in respect to fish, | 272. |
| SERPENT,               | 26. |
| —— ringed, or snake,   | 33. |
| —— *Aberdeen*,         | 35. |
| Shad,                  | 348. |
| *Shakespeare*, his fine comparison of adversity to a toad-stone,    | 17. |
| SHARK,                 | 98. |
| —— picked,              | 100. |
| —— basking,             | 101. |
| —— its vast size,       | 103. |
| —— white, its voracioufness, | 106. |
| —— blue,                | 109. |
| —— long-tailed,         | 110. |
| —— spotted,             | 113. |

*E e 3*
**INDEX.**

<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shark</strong></td>
<td>115.</td>
</tr>
<tr>
<td>—<strong>leather-spotted</strong></td>
<td></td>
</tr>
<tr>
<td>—<strong>smooth</strong></td>
<td>116.</td>
</tr>
<tr>
<td>—<strong>Beaumares</strong></td>
<td>118.</td>
</tr>
<tr>
<td><strong>Skate</strong></td>
<td>82.</td>
</tr>
<tr>
<td>—its method of engendering</td>
<td>83.</td>
</tr>
<tr>
<td><strong>Slow-worm, a harmless serpent</strong></td>
<td>36.</td>
</tr>
<tr>
<td><strong>Smelt</strong></td>
<td>313.</td>
</tr>
<tr>
<td><strong>Smear-dab</strong></td>
<td>230.</td>
</tr>
<tr>
<td><strong>Smooth-fish</strong></td>
<td>208.</td>
</tr>
<tr>
<td><strong>Snail, sea</strong></td>
<td>135.</td>
</tr>
<tr>
<td><strong>Snake, inoffensive</strong></td>
<td>34.</td>
</tr>
<tr>
<td><strong>Sole</strong></td>
<td>231.</td>
</tr>
<tr>
<td>—<strong>smooth</strong></td>
<td>232.</td>
</tr>
<tr>
<td>**Sparling, <strong><em>vide</em> Smelt</strong></td>
<td>346.</td>
</tr>
<tr>
<td><strong>Sprat</strong></td>
<td>62.</td>
</tr>
<tr>
<td><strong>Sperma ceti, what</strong></td>
<td></td>
</tr>
<tr>
<td>**Sperma ceti, whale, <strong><em>vide</em> Cachalot</strong></td>
<td>52.</td>
</tr>
<tr>
<td><strong>Stickle-back, three spined</strong></td>
<td>262.</td>
</tr>
<tr>
<td>—vaft shoals in the <em>Welland</em></td>
<td>ibid.</td>
</tr>
<tr>
<td>—ten spined</td>
<td>262.</td>
</tr>
<tr>
<td>—fifteen spined</td>
<td>263.</td>
</tr>
<tr>
<td><strong>Sting-ray, its dangerous spine</strong></td>
<td>95.</td>
</tr>
<tr>
<td><strong>Sturgeon</strong></td>
<td>124.</td>
</tr>
<tr>
<td><strong>Sucker, lump</strong></td>
<td>133.</td>
</tr>
<tr>
<td>—unctuous</td>
<td>135.</td>
</tr>
<tr>
<td>—<em>Jura</em></td>
<td>137.</td>
</tr>
<tr>
<td>—bimaculated</td>
<td>397.</td>
</tr>
<tr>
<td><strong>Sun fish</strong></td>
<td>129.</td>
</tr>
<tr>
<td><strong>Surmullet, the red</strong></td>
<td>272.</td>
</tr>
<tr>
<td>—extravagantly prized by the <em>Romans</em></td>
<td>ibid.</td>
</tr>
<tr>
<td>—the striped</td>
<td>274.</td>
</tr>
<tr>
<td><strong>Sword-fish</strong></td>
<td>160.</td>
</tr>
<tr>
<td>—manner of taking</td>
<td>161.</td>
</tr>
<tr>
<td>—fishermen's song previous to the capture</td>
<td>162.</td>
</tr>
<tr>
<td>—<em>Xiphias of Ovid</em></td>
<td>ibid.</td>
</tr>
</tbody>
</table>

T.
<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tench,</td>
<td>359</td>
</tr>
<tr>
<td>——— the physician of the fish,</td>
<td>ibid.</td>
</tr>
<tr>
<td>THORACIC fish,</td>
<td>45,</td>
</tr>
<tr>
<td>Thornback,</td>
<td>93.</td>
</tr>
<tr>
<td>Thresher, its combat with the Grampus,</td>
<td>111.</td>
</tr>
<tr>
<td>Toad, its deformity,</td>
<td>14.</td>
</tr>
<tr>
<td>——— used in incantations,</td>
<td>15.</td>
</tr>
<tr>
<td>——— its poison a vulgar error,</td>
<td>17.</td>
</tr>
<tr>
<td>——— attempts to cure cancers by means of it</td>
<td>ibid.</td>
</tr>
<tr>
<td>——— said to be found in the midst of trees and rocks</td>
<td>18.</td>
</tr>
<tr>
<td>——— a farther account of this animal,</td>
<td>379.</td>
</tr>
<tr>
<td>Toad-stone, what,</td>
<td>16.</td>
</tr>
<tr>
<td>Tomus Thurianus, what,</td>
<td>161.</td>
</tr>
<tr>
<td>Tope,</td>
<td>111.</td>
</tr>
<tr>
<td>Fergusch, <em>vide</em> Charr.</td>
<td></td>
</tr>
<tr>
<td>Tork, or Tusk,</td>
<td>203.</td>
</tr>
<tr>
<td>TURTOISE, coriaceous,</td>
<td>7.</td>
</tr>
<tr>
<td>——— farther account of,</td>
<td>379.</td>
</tr>
<tr>
<td>Trout,</td>
<td>297.</td>
</tr>
<tr>
<td>——— sea,</td>
<td>296.</td>
</tr>
<tr>
<td>——— crooked,</td>
<td>299.</td>
</tr>
<tr>
<td>——— gillaroo,</td>
<td>300.</td>
</tr>
<tr>
<td>——— white,</td>
<td>302.</td>
</tr>
<tr>
<td>Tub-fish,</td>
<td>280.</td>
</tr>
<tr>
<td>Tunny,</td>
<td>266.</td>
</tr>
<tr>
<td>——— the fishery very antient,</td>
<td>267.</td>
</tr>
<tr>
<td>——— taken notice of by Theocritus,</td>
<td>ibid.</td>
</tr>
<tr>
<td>Turbot,</td>
<td>233.</td>
</tr>
<tr>
<td>——— fishery,</td>
<td>234.</td>
</tr>
<tr>
<td>Twaiete, a variety of shad,</td>
<td>351.</td>
</tr>
</tbody>
</table>

*U.*
Ulysses, said to have been killed with the spine of the Trygon, or Sting-ray, 95.

Viper, not prolific, 26.

____ its teeth, 27.

____ effects of the bite, and its cure, 30.

____ uses, ibid.

____ the black, 27.

WEEVER,

____ its stroke supposed to be poisonous, 169.

____ the great, 170.

WHALE, the common, 50.

____ vast size, ibid.

____ place, 55.

____ fishery, 54.

____ the English engaged late in it, 53.

____ pike-headed, 56.

____ round-lipped, 58.

____ beaked, 59.

Whalebone, what, 51.

Whiff, a sort of flounder, 238.

White-bait, 371.

Whiting,
INDEX

Whiting, . . . . . . . . . . 190.
Whiting-pout, . . . . . . . . 183.
Whiting-pollack, vide Pollack.
Whistle-fish, . . . . . . . . 201.
White-horse, . . . . . . . . 86.
Wolf-fish, . . . . . . . . . . 151.
——— curious structure of its teeth, . . . . 153.
Wrasse, or old wife, . . . . . . . . 244.
——— bimaculated, . . . . . . . . 247.
——— trimaculated, . . . . . . . . 248.
——— striped, . . . . . . . . . . 249.
——— gibbous. . . . . . . . . . . 250.

THE END.
ERRATA.

Page 5, line 25, for Cerulea read Cerulea. P. 6, l. 8, for naturalists read naturalist. P. 8, l. 5, for twelve read eleven. P. 15, l. 9, for horror read horror. Ibid. l. 14, for intrails read entrails. P. 57, l. 10, for pinniformi read pinniform. P. 78, note, for tripatinam read tripatinum. Ibid. for appellabatur, summa &c. read appellabatur summa &c. P. 79, l. 10, for Lampetra read Lampetrae. P. 85, l. 17, for hire of read hire of. P. 86, l. 16, for piney read piny. P. 87, l. 19, (and passim) for increafes read increafes. P. 89, l. 18, for xii read xii. P. 91, l. 1, for acknowledgements read acknowledgements. P. 98, l. 21, for in read is. P. 105, l. 29, for sediment read sediment. P. 114, note, for 150 read 176. P. 129, l. 16, for oρθαγόρας read oρθαγόρας. P. 131, for Diadon read Diadon. P. 141, l. 8, for serpentinum read serpentinus. P. 185, l. 18, for nufance read nufance. P. 204, l. 1, for favoured read favored. P. 212, l. 12, for refl read rays. P. 215, l. 11, and 230, l. 9, for fappharine read faphphrine. P. 216, l. 3, for alepedotus read alepidotus. P. 217, l. 16, for verrucofo read verrucis. Ibid. l. 17, for bifidis read bifido. P. 239, l. 3, for on the side read on the left side. P. 254, margin, for XXVI read XXVII. P. 273, note*, for p. 222 read 265. P. 276, l. 19, for vario read varia. P. 281, l. 24, for Multis read Mullus. P. 286, l. 21, for Aberglosyn read Aberglosyn. P. 288, l. 29, for back, fin read back-fin. P. 295, l. 1, for cinereous read cinereus. P. 329, l. 12, for radiate read radiata. P. 353, l. 9, for Cyprinus read Cyprinus. Ibid. l. 10, for pinna read pinna. Ibid. l. 15, for 162 read 245. P. 355, l. 18, for this read the. P. 387, l. 28, for factidi read factidd.
ADDITIONAL ERRATA.

Vol. I. P. [xxvi] l. 10, for two read three. Ibid. l. 12, for three read two. P. 210, l. 9, for fresh meat read fresh mice. P. 212, l. 2, for paper color read paler color. P. 217, l. 26, after middle feathers, add of the tail. P. 231, l. 7, after prodigious height, add of the single stones of. P. 311, l. 14, after disteotion, add in April. P. 350, l. 23, for rise, read rising. P. 354, l. 12, after Wood-lark, add and Tit-lark. P. 408, l. 18, for standing, read hunted. P. 411, l. 19, for nook read noon. Vol. III, P. 359, l. 24, for Mr. Diaper, read Moses Browne.

CANCELS.

<table>
<thead>
<tr>
<th>Vol. I.</th>
<th>E 3</th>
<th>-</th>
<th>Pages</th>
<th>53, 54</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 3</td>
<td>-</td>
<td>-</td>
<td>157, 158</td>
<td></td>
</tr>
<tr>
<td>P 3</td>
<td>-</td>
<td>-</td>
<td>205, 206</td>
<td></td>
</tr>
<tr>
<td>Q 4</td>
<td>-</td>
<td>-</td>
<td>223, 224</td>
<td></td>
</tr>
<tr>
<td>C C 3</td>
<td>-</td>
<td>-</td>
<td>381, 382</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vol. III.</th>
<th>M 6</th>
<th>-</th>
<th>Pages</th>
<th>171, 172</th>
</tr>
</thead>
<tbody>
<tr>
<td>X 8</td>
<td>-</td>
<td>-</td>
<td>319, 320</td>
<td></td>
</tr>
<tr>
<td>Z 8</td>
<td>-</td>
<td>-</td>
<td>351, 352</td>
<td></td>
</tr>
<tr>
<td>A a</td>
<td>-</td>
<td>-</td>
<td>353, 354</td>
<td></td>
</tr>
</tbody>
</table>
In May next will be published,

BRITISH ZOOLOGY,
CLASS V.

By THOMAS PENNANT, Esq.

CONTAINING ABOUT
NINETY ELEGANT PLATES
OF THE
Shell and Crustaceous Animals of Great Britain,
WITH DESCRIPTIONS.

N.B. This Work will be published both in QUARTO and OCTAVO.
**BOOKS of NATURAL HISTORY,**
Printed for Benjamin White.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CATESBY's Carolina, 2 vol. coloured, bound</td>
<td>1</td>
<td>16 16 0</td>
</tr>
<tr>
<td>2</td>
<td>Linnæan Index to Catesby</td>
<td>1</td>
<td>0 2 6</td>
</tr>
<tr>
<td>3</td>
<td>British Zoology, by Pennant, coloured, half-bound</td>
<td>1</td>
<td>11 11 0</td>
</tr>
<tr>
<td>4</td>
<td>Borlase's Natural Hist. and Antiquities of Cornwall, 2 vol. bound</td>
<td>1</td>
<td>3 13 6</td>
</tr>
<tr>
<td>5</td>
<td>Flora Danica, Oederi, Fasciculi XI. sist.</td>
<td>1</td>
<td>7 4 0</td>
</tr>
<tr>
<td>6</td>
<td>Idem Liber, figuris depictis</td>
<td>1</td>
<td>0 16 0</td>
</tr>
<tr>
<td>7</td>
<td>Chr. Fris Rotboll, Descript. &amp; Icones Plant. sist.</td>
<td>1</td>
<td>14 14 0</td>
</tr>
<tr>
<td>8</td>
<td>Jof. Miller's Botanical Prints, 14 Numbers, coloured</td>
<td>1</td>
<td>3 13 6</td>
</tr>
<tr>
<td>9</td>
<td>Curtis's Flora Londinensis, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, coloured, at 5s. each, to be continued</td>
<td>5</td>
<td>9 0 0</td>
</tr>
<tr>
<td>10</td>
<td>The same, plain, 2s. 6d. each.</td>
<td>1</td>
<td>5 5 0</td>
</tr>
<tr>
<td>11</td>
<td>Pennant's Tour to Scotland in 1769, and Voyage to the Hebrides 1772, with beautiful cuts, 3 vol. in boards</td>
<td>1</td>
<td>3 3 0</td>
</tr>
<tr>
<td>12</td>
<td>Wilkes's English Moths and Butterflies, coloured</td>
<td>1</td>
<td>5 5 0</td>
</tr>
<tr>
<td>13</td>
<td>Drury's Exotic Insects, 2 vol. coloured, half-bound</td>
<td>1</td>
<td>3 3 0</td>
</tr>
<tr>
<td>14</td>
<td>Brown's Illustrat. of Zoology, with 50 coloured plates</td>
<td>1</td>
<td>1 5 0</td>
</tr>
<tr>
<td>15</td>
<td>Ph. Miller's Gardener's Dict. abridged, bound</td>
<td>1</td>
<td>0 1 6</td>
</tr>
<tr>
<td>16</td>
<td>The Naturalist's Journal, stitched</td>
<td>1</td>
<td>0 2 6</td>
</tr>
<tr>
<td>17</td>
<td>Vandelli Fasciculus Plantarum, sewed</td>
<td>1</td>
<td>0 12 0</td>
</tr>
<tr>
<td>Books</td>
<td>1. s. d.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. <em>Forster, (Joan. Rein. &amp; Georg.) nova Genera Plantarum, cum 78 Tabulis,</em></td>
<td>1 7 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OCTAVO.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Da Costa's <em>Elements of Conchology,</em> <strong>cuts, boards</strong></td>
<td>0 7 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. <em>The same,</em> <strong>cuts coloured, boards</strong></td>
<td>0 1 5 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. <em>Pennant's Synopsis of Quadrupeds,</em> <strong>boards</strong></td>
<td>0 9 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. <em>Forsteri Novæ Species Insectorum,</em> <strong>sewed</strong></td>
<td>0 2 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. <em>Forster's Catal. of N. American Animals</em></td>
<td>0 1 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. <em>Ofbeck's and Toreen's Voyage to China,</em> 2 vol. <strong>bound</strong></td>
<td>0 1 2 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Catcott's <em>Treatise on the Deluge,</em> <strong>bound</strong></td>
<td>0 6 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Curtis's <em>Fundamenta Entomologiae,</em> <strong>sewed</strong></td>
<td>0 2 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. <em>Instruct. for collecting Insects,</em> <strong>stitched</strong></td>
<td>0 1 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. Randi <em>Index Horti Chelseiani,</em> <strong>bound</strong></td>
<td>0 4 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. Martyni <em>Catal. Horti Botanici Cantab. &amp; Mantissa,</em> <strong>stitch</strong></td>
<td>0 4 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. Vandelli de <em>Arbore Draconis,</em> <strong>stitch</strong></td>
<td>0 1 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. Oederi <em>Nomenclator Botanicus,</em> <strong>stitch</strong></td>
<td>0 4 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. Oederi <em>Enumeratio Plant. Floræ Danicæ,</em> <strong>stitch</strong></td>
<td>0 2 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. <em>Rob. Sibbaldi [Eq. Aur.] Phalainologia nova,</em> <strong>stitch</strong></td>
<td>0 3 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. Luidii <em>Lithophylacium Britannicum,</em> <strong>bound</strong></td>
<td>0 7 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. <em>Martyn's first Lecture on Botany,</em> <strong>stitched</strong></td>
<td>0 1 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37. <em>Martyn's Elements of Natural History,</em> <strong>stitched</strong></td>
<td>0 1 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38. <em>Edwards's Elements of Fossilogy,</em> <strong>sewed</strong></td>
<td>0 2 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39. <em>Lee's Introduction to Botany,</em> 3d <strong>edit. bound</strong></td>
<td>0 7 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DUODECIMO.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40. Ph. Miller's <em>Gardener's Kalendar,</em> 16th <strong>edit. bound</strong></td>
<td>0 3 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>