

No. IV. OF PART IV.]

[COMPLETION OF FISH.]

[PRICE 12s.

NOTICE.

[The two following Numbers will include the "Reptiles and Amphibia;" after the publication of which, the present work will be complete. The disposition of the remaining Zoological materials, collected during the "Voyage of the Beagle," must depend upon future circumstances. The First Part of the Geology is in the Press.]

THE  
ZOOLOGY  
OF  
THE VOYAGE OF H.M.S. BEAGLE,  
UNDER THE COMMAND OF CAPTAIN FITZROY, R.N.,  
DURING THE YEARS  
1832 TO 1836.

PUBLISHED WITH THE APPROVAL OF  
THE LORDS COMMISSIONERS OF HER MAJESTY'S TREASURY.

Edited and Superintended by  
CHARLES DARWIN, ESQ. M.A., F.R.S., F.G.S.  
NATURALIST TO THE EXPEDITION.

FISH,  
BY  
THE REV. LEONARD JENYNS, M.A., F.L.S.

LONDON:  
PUBLISHED BY SMITH, ELDER AND CO. 65, CORNHILL.  
MDCCCXLII.

XVII.

April.







FISH.

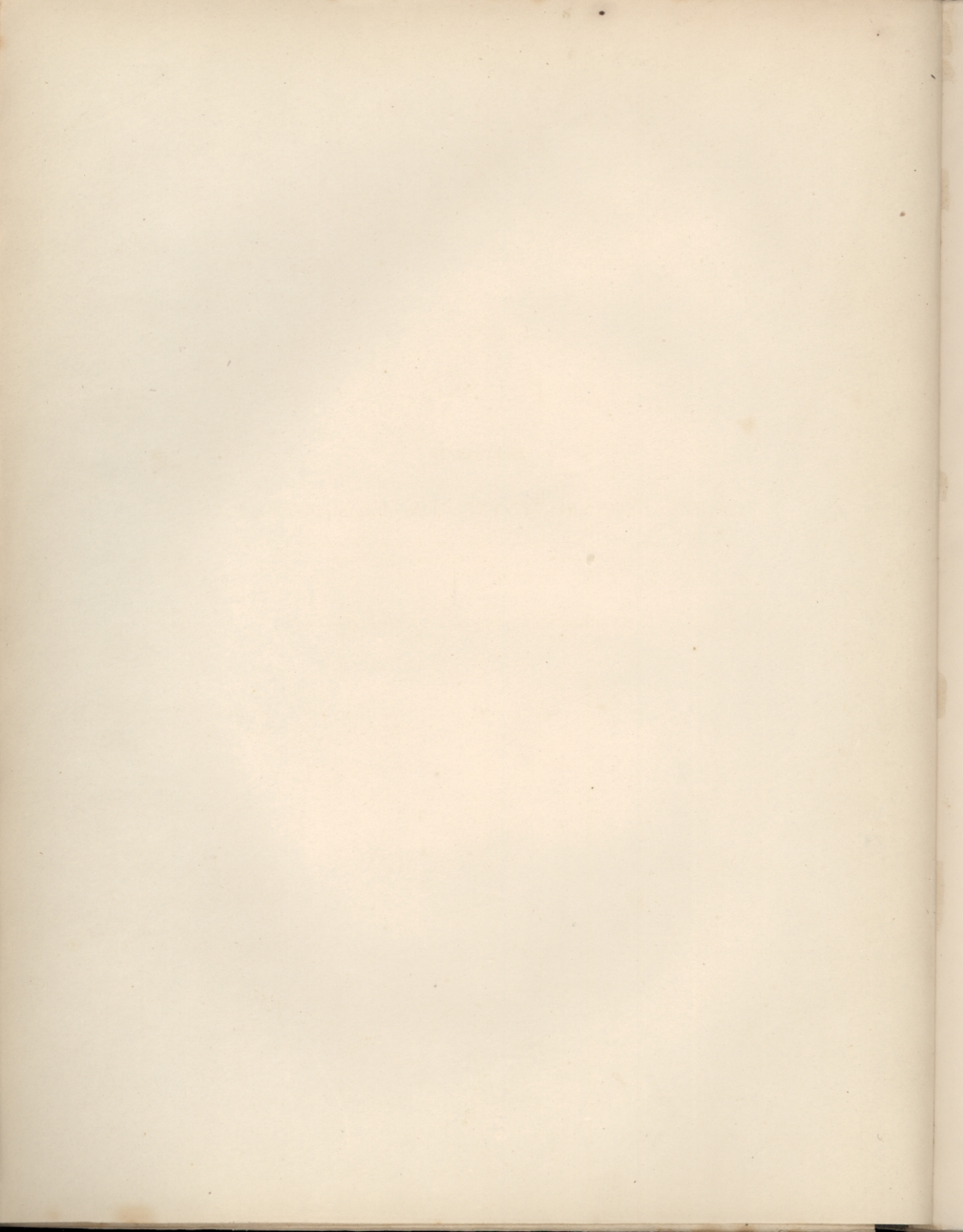
DESCRIBED BY

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WITH A SHORT HISTORY OF CAMBRIDGE, AND AN ACCOUNT OF THE  
MUSEUM OF NATURAL HISTORY.

ILLUSTRATED BY NUMEROUS ENGRAVINGS.







F I S H,

Described by

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Section 10

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ILLUSTRATED BY J. H. JENKINS & J. H. JENKINS

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WITH A SUPPLEMENT BY

ALFRED R. WALLACE, ESQ. F.R.S.

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PRINTED BY STEWART AND MURRAY, 15, OLD BAILEY.

## INTRODUCTION.

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THE number of species of Fish described or noticed in the following Part of the Zoology of the Beagle, amount to 137. It is right to observe that, judging from Mr. Darwin's manuscript notes, relating to what he obtained in this department, this is probably not more than half the entire number which he collected. Unfortunately a large portion of the valuable collection sent home by him arrived in this country in too bad condition for examination, and was necessarily rejected.

The localities visited by Mr. Darwin, and at every one of which more or fewer species of fish were obtained, were the Cape Verde Islands,—the coast of Brazil, including the mouth of the Plata, together with several inland rivers and streams in that district,—the coasts of Patagonia, and the Santa Cruz river,—Tierra del Fuego and the Falkland Islands,—the Archipelago of Chiloe,—the coasts of Chile and Peru,—the Galapagos Archipelago,—Tahiti,—New Zealand, King George's Sound in Australia,—and, lastly, the Keeling Islands in the Indian Ocean. The great bulk of the species, however, are from the coasts, east and west, of South America.

The particular locality assigned to each species respectively in the following work may be relied upon as correct; pains having been taken by Mr. Darwin to affix a small ticket of tin, with a number stamped upon it, to each specimen, and to enter a note immediately in the manuscript catalogue, having the same number attached. In only three or four instances these tickets were found wanting, on the arrival of the collection in this country.

A considerable portion of the species examined and described are new to science, especially of those collected in South America, and the adjoining Islands and Archipelagos. The new ones are supposed to amount to seventy-five at least, constituting more than half the entire number; and amongst these are apparently seven new genera.



It may be interesting to state more particularly from what localities the new species principally come, and what proportion they bear to the *entire* number brought from each of those localities. Thus from Brazil *about half* are considered new;—from Patagonia *at least half*;—from Tierra del Fuego, the Falkland Islands, and the Galapagos Archipelago, *all are new*, without exception; and *nearly all* from Chiloe, and the coasts of Chile and Peru. Of the species brought from Tahiti, New Holland, and the Indian Ocean, not above *one-fourth* are new. This might have been anticipated from the better knowledge which we have of the Ichthyology of that quarter of the globe, than of South America.

It is much to be regretted that the portion of the collection which has been lost to science, was obtained in localities most abounding in novelties, judging from that portion of it which has been saved. Thus, not above five or six species will be found noticed in the following work, from Tierra del Fuego, where Mr. Darwin took especial pains to collect all he could, and, judging from his manuscript catalogue, he must probably have obtained between thirty and forty. From the Falkland Islands again, there have been only saved two out of fifteen or sixteen,—from the coasts of Chile and Peru, not half the entire number obtained, and not above half from the coasts of Patagonia.

There is also described not above half the species brought from King George's Sound, and the Keeling Islands; but as the Indian and Australian species, or at least the former, have been more frequently brought to Europe than the South American, they are less to be regretted than these last.

It is fortunate that *the whole* of the species obtained by Mr. Darwin in the Galapagos Archipelago, amounting to fifteen, have been preserved, and are described in the following pages.

It may now be useful to mention, to what groups principally—first, the entire number of described species belong, and, secondly, that portion of them which are considered new. Both these points will be best judged of from the following table, in which the whole collection is parcelled out according to the families.

## ACANTHOPTERYGII.

PERCIDÆ. Entire No. of species 18 whereof new 11	Brought up . . . 45	22
MULLIDÆ . . . . . 3	SCOMBRIDÆ . . . . . 7	3
TRIGLIDÆ . . . . . 3 . . . 1	TEUTHYDIDÆ . . . . . 2	
COTTIDÆ . . . . . 2 . . . 2	ATHERINIDÆ . . . . . 3 . . . 2	
SCORPÆNIDÆ . . . . . 4 . . . 2	MUGILIDÆ . . . . . 3	
SCIENIDÆ . . . . . 10 . . . 5	BLENNIDÆ . . . . . 11 . . . 7	
SPARIDÆ . . . . . 1 . . . 1	GOBIDÆ . . . . . 3 . . . 2	
MÆNIDÆ . . . . . 2	LABRIDÆ . . . . . 7 . . . 5	
CHÆTODONTIDÆ . . . . . 2	LOPHIDÆ . . . . . 1	
45	TOTAL . . . . . 82	TOTAL, NEW 41



## MALACOPTERYGII.

SILURIDÆ.	Entire No. of species	3	whereof new	2	Brought up	.	.	.	30	21
CYPRINIDÆ.	.	.	.	7	.	.	.	2	.	2
ESOCIDÆ.	.	.	.	1	ECHENEIDIDÆ.	.	.	.	1	
SALMONIDÆ.	.	.	.	8	.	.	.	6	.	2
CLUPEIDÆ.	.	.	.	5	.	.	.			[perhaps more.]
PLEURONECTIDÆ.	.	.	.	6	.	.	.			
				[probably more.]						
				30						
				21	TOTAL	.	.	.	39	TOTAL, NEW 25

## LOPHOBRANCHII.

SYNGNATHIDÆ.	Entire No. of species	.	.	3	whereof new	.	.	3
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## PLECTOGNATHI.

TETRODONTIDÆ.	Entire No. of species	.	.	7	whereof new	.	.	4
BALISTIDÆ.	.	.	.	5	.	.	.	1
				12	TOTAL, NEW	.	.	5
TOTAL	.	.	.					

## CYCLOSTOMI.

PETROMYZONIDÆ.	Entire No. of species	.	.	1	whereof new	.	.	1
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## TOTAL IN THE SEVERAL ORDERS.

ACANTHOPTERYGII.	Entire No. of species	.	.	82	whereof new	.	.	41
MALACOPTERYGII	.	.	.	39	.	.	.	25
LOPHOBRANCHII	.	.	.	3	.	.	.	3
PLECTOGNATHI	.	.	.	12	.	.	.	5
CYCLOSTOMI	.	.	.	1	.	.	.	1
				137	GRAND TOTAL, NEW	.	.	75
GRAND TOTAL	.	.	.					

It appears from the above table that of the entire number of species, three-fifths belong to the Acanthopterygian fishes,—rather more than one-fourth to the Malacopterygian,—and about one-eighth to the remaining orders united.

In the Acanthopterygians, the *new* species amount to one-half; in the Malacopterygians, to about two-thirds; in the remaining orders together, to rather more than one-half.

Looking, therefore, to the entire number of species described, the Acanthopterygians prevail; and it is in the same order that there are most new ones: but looking to the proportion, which in each order the new ones bear to the entire number, it is among the Malacopterygians that this proportion will be found highest.

Restricting our view, it will be also seen, in the Malacopterygians, that the new species are relatively most numerous in the fresh-water groups, such as the *Siluridæ*, the *Cyprinidæ*, and *Salmonidæ*, in which three families taken together,



they amount to five-sixths of the whole. The *Clupeidæ* are an exception, in which all the species are apparently new.

All the species described, belonging to the three families above mentioned, in which there are so many new, viz. the *Siluridæ*, the *Cyprinidæ*, and *Salmonidæ*, are from South America, and the Falkland Islands, excepting one from New Zealand.

Of the remaining fresh-water fishes in the collection, three out of five are presumed to be new. One of these is a species of *Perca*, from the Santa Cruz river, in South Patagonia; the second is a species of *Dules*, from the river Matavai, in Tahiti; the third a species of *Atherina*, from Valparaiso. Perhaps, however, this last is not strictly an inland species.

The entire number of fresh-water species in the collection is twenty-three, and the entire number of new ones amongst these is eighteen. The large proportion of these latter is a circumstance in confirmation of a remark which Cuvier has somewhere made, that the fresh-water fishes of foreign countries are much less known and understood than those found on the coasts. It may serve also as a hint to future travellers.

The seven new genera in the collection belong—one to the *Sciænidæ*, from the Galapagos Archipelago;—one to the *Scombridæ*, from North Patagonia;—three to the *Blennidæ*, whereof one is from the Archipelago of Chiloe, the second from the Falkland Islands, and the third from New Zealand;—one to the *Cyprinidæ*, embracing three species, from South Patagonia, Tierra del Fuego, and New Zealand; and, lastly, one to the *Salmonidæ*, embracing two species from the Falkland Islands and Tierra del Fuego respectively.

It has been already mentioned, that all the species obtained by Mr. Darwin in the Galapagos Archipelago have been preserved. As they are likewise all new, and those islands appear to have been scarcely visited by any naturalist previously, it may be interesting to enumerate the several genera to which they belong, and the number of species in each genus respectively.

SERRANUS . . . .	3 species.	Fam. PERCIDÆ.	}	ACANTHOPTERYGII.
PRIONOTUS . . . .	1    "	— TRIGLIDÆ.		
SCORPÆNA . . . .	1    "	— SCORPÆNIDÆ.		
PRIONODES <i>N.G.</i>	1    "	— SCIÆNIDÆ.		
PRISTIPOMA . . . .	1    "			
LATILUS . . . . .	1    "			
CHRYSOPHRYS . .	1    "	— SPARIDÆ.	}	MALACOPTERYGII.
GOBIUS . . . . .	1    "	— GOBIDÆ.		
COSSYPHUS . . . .	1    "	— LABRIDÆ.		
GOBIESOX . . . .	1    "	— CYCLOPTERIDÆ.		
MURÆNA . . . . .	1    "	— ANGUILLIDÆ.		
TETRODON . . . .	2    "	— TETRODONTIDÆ.		PLECTOGNATHI.



In making the foregoing estimates, as regards the number of new species brought home by Mr. Darwin, I have been guided almost entirely by my own judgment. The difficulty, however, of ascertaining, in a miscellaneous collection of this nature, brought from various localities, what *are* really new to science, is very great; and this difficulty is much increased, where an author is situate apart from large public museums to which he might have recourse for comparison. Possibly, therefore, some of those described as new in the following work, may not be so in reality; and, in one instance, as mentioned in the Appendix, this is known to be the case. My excuse, however, must rest upon what has been just stated. It is hoped that caution has been generally shown, at least in regard to specimens not in a good state of preservation; and, in several such cases, in which an accurate description was hardly practicable,—though they could not be referred to any known species,—they are not positively declared new, nor any names imposed upon them whatever.

I have, of course, consulted throughout the invaluable volumes of Cuvier and Valenciennes, so far as they have yet advanced in the subject; and in them it will be found that a few species, brought by Mr. Darwin from South America, and still but little known, had nevertheless been previously obtained from the same country by M. Gay. The zoological atlases of the three great French voyages by Freycinet, Duperrey and D'Urville have been also carefully looked through; and, in regard particularly to the fish of South America, the works of Humboldt, Spix and Agassiz, and the more recent one, now in course of publication, by M. D'Orbigny.

There is an equal difficulty felt by every naturalist at the present day, in distinguishing species from varieties. And in the case of Fish, residing in a peculiar element, and so much removed from our observation,—we are almost at a loss to know, at present, to what extent their characters may be modified by local and accidental causes, or how far we may trust a different geographical position for giving permanence and value to a slight modification of form different from what occurs in the species of our own seas. Still less easy is it to determine the true importance of characters, in instances in which it is only permitted to see a single specimen of the kind, or, at most, very few individuals.

Many mistakes, therefore, are liable to occur, in a work of this nature, arising from the above sources. The only way to prevent their creating any permanent confusion in the science, is to describe all species of which the least doubt is entertained, in such detail, and with such accuracy, that they may not fail of being recognized by any observer, to whom they may occur a second time. They will not then *continue to hold a false position* in the system, as *spurious*



species. They may not be new, or they may not be species at all,—but they will be *known*; and any mistake which has been committed will be at once rectified,—any new name which has been wrongly imposed, immediately degraded to a synonym.

Accordingly I have been careful in this respect; and I have in some instances, given full descriptions, even of species which are certainly not new, but which I did not find described by previous authors with all the detail that was requisite for completely identifying them; or, leaving out what they have noticed, I have added such characters as they have omitted. My main object has been to render all the species, whether rightly named or not, easily recognizable; and, however little the science may be advanced by what is brought forward, to make that advance, so far as it goes, sure.

The method of description, and the mode of computing the fin-ray formula, will be found conformable to the plan adopted in the “*Histoire des Poissons*” of Cuvier and Valenciennes; a work which, in so many respects, must always serve as a model to labourers in this department of zoology.

The colours, in the great majority of instances, were, fortunately, noticed by Mr. Darwin in the recent state. The nomenclature employed by him for the purpose is that of Patrick Syme; and he informs me, that a comparison was always made with the book in hand, previous to the exact colour in any case being noted. Where I have observed any markings left unnoticed by Mr. Darwin, I have added them myself; and, in most instances, I have given the general disposition of the colours as they appear in spirits, from the circumstance of their being often so much altered by the liquor, and liable to mislead those, who have only the opportunity of seeing them in preserved specimens. This is what Cuvier and Valenciennes have frequently done in their work; and from them I have borrowed the practice.

In a work of this nature, it has not been thought desirable to enter into any discussion of the principles of scientific arrangement, or to effect any change in systems already received; its main object being the description of species. For this reason, I have taken the groups almost exactly as they stand in the “*Histoire des Poissons*” of Cuvier and Valenciennes, or in the “*Regne Animal*” of the former: yet there is reason to believe that many parts of their system will be found hereafter to require some modification, especially in regard to families and genera which have for their distinctive character the presence or absence of vomerine or palatine teeth. The small value which is to be attached to such character is pointed out in some instances in the following work, and much dwelt upon.

In conclusion, it may be stated, that the whole of the species in the collection of fish brought home by Mr. Darwin, described in the following pages, have been deposited by him in the Museum of the Philosophical Society of Cambridge. They are mostly in spirit, and, generally speaking, in a good state of preservation; some few, however, are in the state of skins only, and have been mounted.

L. JENYNS.

*Swaffham Bulbeck,*

*Jan. 8, 1842.*





# SYSTEMATIC TABLE OF SPECIES, WITH THEIR RESPECTIVE HABITATS.

## ACANTHOPTERYGII.

### PERCIDÆ.

<i>Perca lævis</i> , <i>Jen.</i> . . . .	South Patagonia.
<i>Serranus albo-maculatus</i> , <i>Jen.</i> . .	Galapagos Archipelago.
——— <i>Goreensis</i> , <i>Val.?</i> . . . .	Cape Verde Islands.
——— <i>aspersus</i> , <i>Jen.</i> . . . .	Ditto.
——— <i>labriformis</i> , <i>Jen.</i> . . . .	Galapagos.
——— <i>olfax</i> , <i>Jen.</i> . . . .	Ditto.
<i>Plectropoma Patachonica</i> , <i>Jen.</i> . .	North Patagonia.
<i>DiaCOPE marginata</i> , <i>Cuv.</i> . . . .	Keeling Islands.
<i>Arripis Georgianus</i> . . . . .	King George's Sound.
<i>Aplodactylus punctatus</i> , <i>Val.</i> . .	
<i>Dules Auriga</i> , <i>Cuv. et Val.</i> . . . .	Maldonado.
——— <i>Leuciscus</i> , <i>Jen.</i> . . . .	Tahiti.
<i>Helotes octolineatus</i> , <i>Jen.</i> . . . .	King George's Sound.
<i>Aphritis undulatus</i> , <i>Jen.</i> . . . .	Archipelago of Chiloe.
——— <i>porosus</i> , <i>Jen.</i> . . . .	Central Patagonia.
<i>Pinguipes fasciatus</i> , <i>Jen.</i> . . . .	North Patagonia.
——— <i>Chilensis</i> , <i>Val.</i> . . . .	Valparaiso.
<i>Percophis Brasilianus</i> , <i>Cuv.</i> . . .	North Patagonia.

### MULLIDÆ.

<i>Upeneus flavo-lineatus</i> , <i>Cuv. et Val.</i>	Keeling Islands.
——— <i>trifasciatus</i> , <i>Cuv.</i> . . . .	Tahiti.
——— <i>Prayensis</i> , <i>Cuv. et Val.?</i>	Cape Verde Islands.

### TRIGLIDÆ.

<i>Trigla Kumu</i> , <i>Less. et Garn.</i> . . . .	New Zealand.
<i>Prionotus punctatus</i> , <i>Cuv.</i> . . . .	Rio de Janeiro.
——— <i>Miles</i> , <i>Jen.</i> . . . .	Galapagos.

### COTTIDÆ.

<i>Aspidophorus Chilensis</i> , <i>Jen.</i> . .	Chiloe.
<i>Platycephalus inops</i> , <i>Jen.</i> . . . .	King George's Sound.

### SCORPÆNIDÆ.

<i>Scorpæna Histrio</i> , <i>Jen.</i> . . . .	Galapagos.
<i>Sebastes oculata</i> , <i>Val.?</i> . . . .	Valparaiso.
<i>Agriopus hispidus</i> , <i>Jen.</i> . . . .	Archipelago of Chiloe.
<i>Apistus</i> ———— <i>?</i> . . . . .	King George's Sound.

### SCIÆNIDÆ.

<i>Otolithus Guatucupa</i> , <i>Cuv. et Val.</i>	Maldonado.
——— <i> analis</i> , <i>Jen.</i> . . . .	Coast of Peru.
<i>Corvina adusta</i> , <i>Agass.</i> . . . .	Maldonado.
<i>Umbrina arenata</i> , <i>Cuv. et Val.</i> . .	North Patagonia.
——— <i>ophicephala</i> , <i>Jen.</i> . . . .	Coquimbo.
<i>Prionodes fasciatus</i> , <i>Jen.</i> . . . .	Galapagos.
<i>Pristipoma cantharinum</i> , <i>Jen.</i> . .	Ditto.
<i>Latilus jugularis</i> , <i>Val.</i> . . . .	Valparaiso.
——— <i> princeps</i> , <i>Jen.</i> . . . .	Galapagos.
<i>Heliases Crusma</i> , <i>Val.</i> . . . .	Valparaiso.

### SPARIDÆ.

<i>Chrysophrys taurina</i> , <i>Jen.</i> . . . .	Galapagos.
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### MÆNIDÆ.

<i>Gerres Gula</i> , <i>Cuv. et Val.?</i> . . . .	Rio de Janeiro.
——— <i>Oyena</i> , <i>Cuv. et Val.?</i> . . . .	Keeling Islands.

### CHÆTODONTIDÆ.

<i>Chætodon setifer</i> , <i>Bl.</i> . . . .	Keeling Islands.
<i>Stegastes imbricatus</i> , <i>Jen.</i> . . . .	Cape Verde Islands.

### SCOMBRIDÆ.

<i>Paropsis signata</i> , <i>Jen.</i> . . . .	North Patagonia.
<i>Caranx declivis</i> , <i>Jen.</i> . . . .	King George's Sound.
——— <i>torvus</i> , <i>Jen.</i> . . . .	Tahiti.

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## SCOMBRIDÆ—continued.

<i>Caranx Georgianus</i> , Cuv. et Val.	King George's Sound.
<i>Seriola bipinnulata</i> , Quoy et Gaim.	Keeling Islands.
<i>Psenes</i> — ?	South Atlantic Ocean.
<i>Stromateus maculatus</i> , Cuv. et Val.?	Chiloe.

## TEUTHYDIDÆ.

<i>Acanthurus triostegus</i> , Bl. Schn.	Keeling Islands.
————— <i>humeralis</i> , Cuv. et Val.	Tahiti.

## ATHERINIDÆ.

<i>Atherina argentinensis</i> , Cuv. et Val.?	Maldonado.
————— <i>microlepidota</i> , Jen.	Valparaiso.
————— <i>incisa</i> , Jen.	North Patagonia.

## MUGILIDÆ.

<i>Mugil Liza</i> , Cuv. et Val.?	North Patagonia.
————— ?	Keeling Islands.
<i>Dajaus Diemensis</i> , Richards.	King George's Sound.

## BLENNIDÆ.

<i>Blennius palmicornis</i> , Cuv. et Val.	Cape Verde Islands.
<i>Blennechis fasciatus</i> , Jen.	Concepcion.
————— <i>ornatus</i> , Jen.	Coquimbo.
<i>Salarias atlanticus</i> , Cuv. et Val.	Cape Verde Islands.

## BLENNIDÆ—continued.

<i>Salarias quadricornis</i> , Cuv. et Val.?	Keeling Islands.
———— <i>vomerinus</i> , Cuv. et Val.?	Cape Verde Islands.
<i>Clinus crinitus</i> , Jen.	Coquimbo.
<i>Acanthoclinus fuscus</i> , Jen.	New Zealand.
<i>Tripterygion Capito</i> , Jen.	New Zealand.
<i>Iluocœtes fimbriatus</i> , Jen.	Archipelago of Chiloe.
<i>Phucocœtes latitans</i> , Jen.	Falkland Islands.

## GOBIDÆ.

<i>Gobius lineatus</i> , Jen.	Galapagos.
<i>Gobius ophicephalus</i> , Jen.	Archipelago of Chiloe.
<i>Eleotris Gobioides</i> , Val.	New Zealand.

## LOPHIDÆ.

<i>Batrachus porosissimus</i> , Cuv. et Val.?	Bahia Blanca.
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## LABRIDÆ.

<i>Cossyphus Darwini</i> , Jen.	Galapagos.
<i>Cheilio ramosus</i> , Jen.	Japan?
<i>Chromis facetus</i> , Jen.	Maldonado.
<i>Scarus chlorodon</i> , Jen.	Keeling Islands.
———— <i>globiceps</i> , Cuv. et Val.	Tahiti.
———— <i>lepidus</i> , Jen.	Tahiti.
———— ?	Keeling Islands.

## MALACOPTERYGII.

## SILURIDÆ.

<i>Pimelodus gracilis</i> , Val.?	Rio de Janeiro.
———— <i>exsudans</i> , Jen.	Ditto?
<i>Callichthys paleatus</i> , Jen.	

## CYPRINIDÆ.

<i>Pœcilia unimaculata</i> , Val.	Rio de Janeiro.
———— <i>decem-maculata</i> , Jen.	Maldonado.
<i>Lebias lineata</i> , Jen.	Ditto.
———— <i>multidentata</i> , Jen.	Monte Video.
<i>Mesites maculatus</i> , Jen.	South Patagonia.
———— <i>alpinus</i> , Jen.	Tierra del Fuego.
———— <i>attenuatus</i> , Jen.	New Zealand.

## ESOCIDÆ.

<i>Exocœtus exsiliens</i> , Bl.?	Pacific Ocean.
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## SALMONIDÆ.

<i>Tetragonopterus Abramis</i> , Jen.	Rio Parana, S. America.
———— <i>rutilus</i> , Jen.	Ditto.
———— <i>scabripinnis</i> , Jen.	Rio de Janeiro.
———— <i>tæniatus</i> , Jen.	Ditto.
———— <i>interruptus</i> , Jen.	Maldonado.

## SALMONIDÆ—continued.

<i>Hydrocyon Hepsetus</i> , Cuv.	Maldonado.
<i>Aplochiton Zebra</i> , Jen.	Falkland Islands.
———— <i>tæniatus</i> , Jen.	Tierra del Fuego.

## CLUPEIDÆ.

<i>Clupea Fuegensis</i> , Jen.	Tierra del Fuego.
———— <i>arcuata</i> , Jen.	Bahia Blanca.
———— <i>sagax</i> , Jen.	Lima.
<i>Alosa pectinata</i> , Jen.	North Patagonia.
<i>Engraulis ringens</i> , Jen.	Coast of Peru.

## PLEURONECTIDÆ.

<i>Platessa Orbignyana</i> , Val.?	Bahia Blanca.
———— ?	King George's Sound.
<i>Hippoglossus Kingii</i> , Jen.	Valparaiso.
<i>Rhombus</i> — ?	Bahia Blanca.
<i>Achirus lineatus</i> , D'Orb.	Coast of Brazil.
<i>Plagusia</i> — ?	Coast of Patagonia.

## CYCLOPTERIDÆ.

<i>Gobiesox marmoratus</i> , Jen.	Archipelago of Chiloe.
———— <i>pœcilophthalmos</i> , Jen.	Galapagos.

## ECHENEIDIDÆ.

*Echeneis Remora*, *Linn.* . . . Atlantic Ocean.

## ANGUILLIDÆ.

*Anguilla australis*, *Richards.* . . New Zealand.  
*Conger punctus*, *Jen.* . . . Tierra del Fuego.

ANGUILLIDÆ—*continued.*

*Muraena lentiginosa*, *Jen.* . . . Galapagos.  
 ——— *ocellata*, *Agass.* . . . Rio de Janeiro.  
 ——— ? . . . Cape Verde Islands.  
 ——— ? . . . Tahiti.

## LOPHOBRANCHII.

## SYNGNATHIDÆ.

*Syngnathus acicularis*, *Jen.* . . Valparaiso.  
 ——— *conspicillatus*, *Jen.* . Tahiti.  
 ——— *crinitus*, *Jen.* . . . Bahia Blanca.

## PLECTOGNATHI.

## TETRODONTIDÆ.

*Diodon nychthemerus*, *Cuv.* . .  
 ——— *rivulatus*, *Cuv.* . . . Maldonado.  
 ——— *antennatus*, *Cuv.?* . . . Bahia Blanca.  
*Tetrodon acrostaticus*, *Jen.*  
 ——— *implutus*, *Jen.* . . . Keeling Islands.  
 ——— *annulatus*, *Jen.* . . . Galapagos.  
 ——— *angusticeps*, *Jen.* . . Ditto.

## BALISTIDÆ.

*Balistes Vetula*, *Bl.* . . . South Atlantic Ocean.  
 ——— *aculeatus*, *Bl.* . . . Tahiti.  
*Aleuteres maculosus*, *Richards.* . King George's Sound.  
 ——— *velutinus*, *Jen.* . . Ditto.  
*Ostracion punctatus*, *Schn.* . . Tahiti.

## CYCLOSTOMI.

## PETROMYZONIDÆ.

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fins, and consequently a larger interval between the anal and the caudal; also, in the number and arrangement of the dotted lines on the cheeks. The colours are likewise different; and, in the living fish, in which they were not noticed, probably the dark longitudinal lines, alluded to in the description above, are much more conspicuous than they are at present.

This species was taken by Mr. Darwin off Chatham Island, in the Galapagos Archipelago.

## 2. GOBIUS OPHICEPHALUS. *Jen.*

PLATE XIX. FIG. 3

*G. pallenti-plumbeus, fusco-reticulatus: corpore elongato, gracili, undique alepidoto: capite lato, depresso, genis tumidis; his et rostro punctis valde salientibus, creberrimis, lineis undantibus dispositis: maxillis æqualibus: dentibus velutinis; externis, præsertim lateralibus, fortioribus, aculeiformibus; caninis nullis: oculis parvis, prominulis, intervallo plus quam diametrum æquante: pinnis dorsalibus subcontiguïs, altitudine subæqualibus; pectoralibus radiis omnibus membranâ inclusis; caudali rotundatâ, radiis clausis, subacutâ.*

D. 8—1/16; A. 1/13; C. 17, &c.; P. 21; V. 1/5.

LONG. unc. 2. lin. 11.

FORM.—Body considerably elongated, and compressed posteriorly: the greatest depth beneath the first dorsal, equalling rather less than one-eighth of the entire length: thickness at that point rather less than the depth. Head broader than the body, very much flattened in the crown behind the eyes, with the cheeks tumid, and, on the whole, snake-like in appearance: its length one-fifth of the entire length; its breadth two-thirds of its own length. Eyes small, but rather prominent, high in the cheeks, with a diameter scarcely exceeding a line in length, or about one-sixth that of the head; the space between a little hollowed out, and nearly a diameter and a half across. Snout short and obtuse: jaws equal; the gape not quite reaching to beneath the middle of the orbit. The teeth form a broad velutine band in each jaw, with those in the outer row strong and slightly hooked: of these last there are about twenty in the upper, the lateral ones being stronger than those in front; in the lower they are not so numerous, and more irregular: none that can be strictly called canines: likewise no vomerine or palatine teeth.

Pectorals one-sixth of the entire length, oval, with the middle rays longest; all the rays included in the membrane. Ventrals united; about two-thirds the length of the pectorals. First dorsal extending beyond the extremities of the pectorals; the rays very gradually decreasing in length, the membrane beyond the last also sloping very gradually down till it nearly reaches the second dorsal, which it does not quite touch. Rays of the second dorsal of nearly uniform height, about equalling the longest of those in the first, also equalling the depth of the body beneath. The last ray in both these fins is double, as in the last species. The anal commences beneath the fourth ray of the second dorsal, and terminates a little sooner than that fin. The caudal, when the rays are spread, appears rounded; but when closed, somewhat pointed:



it is contained not quite six and-a-half times in the entire length. The space between the anal and the caudal is one-eighth of the same, and one and a half times the depth of the tail at that part. The usual papilla appears behind the vent.

Skin apparently quite naked everywhere, and without any scales that are visible, even in the dried state, under a lens. The lateral line runs straight along the middle, and is marked by a series of glandular dots placed in threes or fours together vertically at moderate intervals. Several lines of dots about the head, but the dots are here closer together, and in some places so salient as to appear like short filamentous processes: on the cheeks, about the eyes, and on the front of the snout, these lines undulate in an irregular manner: there are also two or three short lines of dots on the gill-cover, and a double row on each side of the lower jaw, passing obliquely upwards posteriorly, as a boundary to the cheek.

COLOUR.—“Pale lead-colour, coarsely reticulated with brown.”—D.—This is nearly as it appears also in spirits. The reticulations are finer on the head, where they are also most distinct: they are likewise very visible at the base of the pectorals.

Habitat, Chonos Archipelago, South of Chiloe.

Cuvier and Valenciennes seem to have doubted \* whether there were really any species in this genus absolutely without scales, though they have established a section, in which the scales are very minute, and as it were lost in the skin. The present one, however, appears to be thus characterized: at least there are no scales which can be detected, even with the assistance of a lens, and when the skin is suffered to become dry, in which state they are generally visible, if really present. In fact, the skin is as smooth and naked as in any of the true Blennies. This character, combined with others, clearly indicates it to be a new species; neither will it assimilate with any of the sections in the “*Histoire des Poissons*,” but requires to be placed in one by itself, in which the absence of scales is coupled with an elongated body, and a caudal, not strictly pointed, but approaching to that form, when the rays are close.

This species was obtained by Mr. Darwin in the Chonos Archipelago, in Lowe's Harbour, S. of Chiloe. It appears to be the first of this genus brought from the West Coast of America; at least, there are none, amongst the very numerous species described by Cuvier and Valenciennes, which are mentioned as belonging to those shores.

#### ELEOTRIS GOBIOIDES. *Cuv. et Val.*

*Eleotris gobioides*, *Cuv. et Val.* Hist. des Poiss. tom. xii. p. 186.

This species was taken by Mr. Darwin in fresh-water, in the Bay of Islands, New Zealand. It so well accords with the description of the *E. gobioides* in the “*Histoire des Poissons*,” that I conceive there can be no doubt of their identity.

\* See “Hist. des Poiss.” tom. xii. p. 72, under the species *Gobius Boscii*.



The profile slopes very gently. The lower jaw is longest, ascending to meet the upper. There are three or four longitudinal lines on the sides of the head, especially a very well marked one (not particularly noticed by Valenciennes) extending backwards from the posterior angle of the eye to the upper angle of the gill-opening. No appearance of any lateral line. This specimen has a ray more in the anal than Valenciennes gives. The fin-ray formula is as follows:—

B. 6; D. 6—1/10, the last double; A. 1/10, the last double; C. 16, &c.;  
P. 18; V. 1/5.

Length 4 inches 1 line.

This species, except in respect of its separate ventrals, has very much the habit and general appearance of the *Gobius niger* of the European seas.

#### FAMILY.—LOPHIDÆ.

##### BATRACHUS POROSISSIMUS. *Cuv. et Val.?*

*Batrachus porosissimus*, *Cuv. et Val.* Hist. des Poiss. tom. xii. p. 373.

FORM.—Head very large, broad and depressed, exactly one-fourth of the entire length; its breadth two-thirds of its own length. Body compressed posteriorly, with its greatest depth about one-sixth of the entire length. Snout blunt and rounded, the lower jaw projecting; gape wide. The teeth above form but a single row along the intermaxillary, mostly small, but sharp, and the posterior ones much curved: along each palatine there is a row of much stronger ones, and at each angle of the vomer are two very long hooked ones, resembling true canines. In the lower jaw the teeth are in a single row at the sides, but in two or three rows in front, and are unequally sized, some of the lateral ones being as strong as those on each side of the vomer, and much hooked, as well as partially reclining backwards. Tongue smooth, and free at the tip, which is bluntish. Pharynx armed with two patches of velutine teeth above and below. No regular barbule at the chin, but a row of minute cutaneous cirri running all round the edge of the lower jaw; a similar row along the anterior edge of the upper jaw, behind the intermaxillary, with two thicker and more conspicuous appendages of the skin in the middle. Eyes far apart, and not very large. Opercle armed with one very strong spine, but only just the point appearing through the skin.

Two small spines in front of the dorsal, a little more backward than the insertion of the pectorals, the first very minute, and hardly appearing through the skin. Second or true dorsal very long, reaching to the base of the caudal, and of nearly uniform height throughout, equalling about one-third of the greatest depth of the body; the rays branched, and the membrane notched between their tips. Anal commencing under the fifth dorsal ray, similar to that fin, but with the membrane more notched between the rays: both fins are fastened down at their extremities to the fleshy part of the tail by a membrane. Caudal slightly rounded, when spread. Pectorals broad and large, but, from the middle rays being longest, appearing somewhat wedge-shaped, not quite equalling the length of the head. Ventrals much smaller, only half their length, and cut nearly square.



Skin perfectly naked. The lines of pores, which are very numerous about the head and body, run in the exact directions laid down by Cuvier and Valenciennes, in their description of the *B. porosissimus*; but in addition to those which have been pointed out by them, there is one commencing at the nostrils, and passing underneath each eye, thence ascending a little behind the eye to descend again by the margin of the preopercle; another directed transversely across the cheek, connecting the former with the row that passes along the edge of the lower jaw: this transverse row, if continued upwards, would form a tangent to the posterior part of the orbit. All the lines of pores are furnished with very minute cutaneous appendages, similar to those already spoken of above, as fringing the edges of the jaws.

D. 2—36; A. 33; C. 12, &c.; P. 20; V. 1/2.

Length 9 inches.

COLOUR.—“Above purple-coppery; sides pearly; beneath yellowish, with silver dots in regular figures; iris coppery.”—D. The silver dots alluded to by Mr. Darwin, are the lines of pores. There are two longitudinal dark lines on the dorsal, the uppermost serving as an edging: the anal also is edged in the same manner, especially posteriorly.

Habitat, Bahia Blanca.

This species was found by Mr. Darwin cast up on the beach at Bahia Blanca, where he states that it is not uncommon. It approaches so closely the *B. porosissimus* of Cuvier and Valenciennes, that I dare not consider it as distinct without comparison. Yet it differs from their description of that species, in having four vomerine teeth, instead of two; in having six more rays in the anal fin; and in having the additional lines of pores above indicated; though these last may have been accidentally left unnoticed. It requires the examination of more specimens to determine whether these differences result from a difference in species or not.

#### FAMILY.—LABRIDÆ.

COSSYPHUS DARWINI. *Jen.*

PLATE XX.

*C. corpore elongato-ovali; capite grandi, fronte elevato, rostro ex hoc declivi: caninis quatuor fortibus ad apicem utriusque maxillæ, ad angulos oris nullis; dentibus lateralibus conicis; interiùs, ad latera palati, granis plurimis minutis obtusis: preoperculo, limbo excepto, operculo, et interoperculo, squamatis; preoperculo margine integro: rostro, maxillis, et suborbitalibus ante oculos, nudis: lineâ laterali subrectâ: pinnâ dorsali parte spinosâ humili, spinis ad apices laciniatis; molli, heic respondente anali, duplè altiore, sub-acuminatâ: caudali æquali, solùm radiis exterioribus aliis paulo longioribus.*

D. 12/10; A. 3/12; C. 14, &c.; P. 17; V. 1/5.

LONG. unc. 19.



FORM.—Head large : body of a suboval form, but much elongated : greatest depth at the nape contained about four times and three quarters in the entire length : head not quite three times and three quarters in the same. Nape and forehead high, whence the profile descends obliquely in a straight line to the end of the snout. Jaws equal, and rather acute : lips fleshy : the end of the maxillary not quite reaching to a vertical line from the anterior margin of the orbit. Four very conspicuous, strong, curved, canine teeth at the anterior extremity of each jaw ; those above of nearly equal length, but the two middle ones rather longer and stouter than the other two ; of those below, on the contrary, the outer ones are the longest, as well as strongest, being nearly twice as much developed as the middle ones, which last are of about the same length as, but rather slenderer than, the outer ones above. The teeth at the sides of the jaw are short and conical, and not very sharp pointed, forming a regular series ; below they amount to nine or ten on each side ; above, the series may have been originally of the same number, but in this specimen several appear wanting. Besides these conical teeth at the sides of the jaws, there is an inner band of small rounded grains about the size of pins' heads : the band is broader, and the grains larger and more distinct above than below : many of them appear much flattened, and as if ground down by use. Eyes of moderate size ; their diameter about one-seventh the length of the head ; rather high in the cheeks, and nearly equidistant from the end of the snout and the posterior angle of the opercle. Snout and sub-orbital in advance of the eyes, as well as the jaws, naked. Preopercle large ; occupying the posterior half of the cheek, rectangular, but the angle at bottom much rounded, the ascending margin vertical, both margins entire ; covered with small scales ; the limb rather broad, bounded internally by a slightly raised ridge, and without scales, but with a few scattered small pores. The opercle and subopercle form together an irregular oblong, of which the height is double the length ; both are covered with scales larger than those on the preopercle : the membrane terminates behind in a blunt angle. The interopercle, which is very distinct, has three rows of scales on its surface, but none on the margin.

The lateral line is nearly straight throughout its course, the bend downwards beneath the termination of the dorsal fin being scarcely perceptible. The tubes of which it is composed are unbranched ; many of them, however, incline upwards at their posterior extremity towards the back. The scales on the body are rather larger than those on the opercle : there appear to be upwards of fifty in a longitudinal line. The free portion of each scale has its surface finely granulated in the middle, and striated at the sides.

The dorsal commences rather before one-third of the entire length, excluding caudal, and occupies a space equalling nearly half the same ; the spinous portion is low, and the spines of nearly the same length, the first and second only being rather shorter than the succeeding ones ; the membrane between the spines notched : the soft portion rather pointed, and twice as much elevated as the spinous. The anal commences beneath the eleventh or twelfth dorsal spine, and terminates in the same vertical line with that fin ; the soft portion, which answers to the soft portion of the dorsal, is preceded by three spines, increasing in length to the third, which is double the first, though itself not above half the length of the soft rays ; these spines are not particularly stout. The space between the anal and caudal equals one-sixth of the whole length. Caudal rays nearly even, with the exception of the two outermost above and below, which being rather longer than the others, give the fin a slightly crescent-shaped form : the base of the caudal is scaly, but the scales advance only a very little way between



the rays. Pectorals very little in advance of the ventrals, in length more than half that of the head, with the second, third, and fourth rays longest. Ventrals in an exact vertical line with the commencement of the dorsal, nearly equal to the pectorals, with the first and second soft rays longest; the spine rather more than half the length of the first soft ray; the last soft ray united to the body by a membrane.

COLOURS.—“Centre of each scale pale vermilion red: lower jaw quite white: a large irregular patch above the pectoral bright yellow: iris red, pupil blue-black.”—D. The dried skin in its present state is of a nearly uniform brown.

Habitat, Chatham Island, Galapagos Archipelago.

I have named this species in honour of Mr. Darwin, whose researches in the Galapagos Archipelago, where he obtained it, have been so productive in bringing to light new forms. I have referred it to the genus *Cossyphus* of Valenciennes, on account of the small rounded grains behind the principal teeth; but it rather departs from that group in not having the preopercle denticulated, and in having no scales on any of the vertical fins, with the exception of a few at the base of the caudal. In some respects it seems intermediate between that genus and *Labrus*. It does not appear to be described, though it seems to approach the *C. reticulatus* of Valenciennes in many of its characters. That species however is from Japan.

The canines at the anterior extremity of each jaw are very conspicuous in this fish, and give it at first sight much the appearance of a *Dentex*.

CHEILIO RAMOSUS. *Jen.*

*C. nigro-fuscus, infra lineam lateralem et in ventre obscure argenteus; pinnis pallide fuscis immaculatis: corpore valde elongato: dentibus in maxilla superiore duobus anticis caninis fortibus, lateralibus conicis parvis subæqualibus; in inferiore, caninis parvis, lateralibus variis inæqualibus: lineâ laterali ramosâ.*

B. 6; D. 9/13; A. 3/12; C. 12, et 4 breviores; P. 11; V. 1/5.

LONG. unc. 9. lin. 6.

FORM.—Very much elongated, with the dorsal and ventral lines nearly straight. Depth varying but little, and contained nine and a half times in the entire length; thickness not quite three-fourths of the depth. Head elongated, contained not more than three and a half times in the entire length, compressed, with the cheeks vertical. Snout very much produced, slightly rounded at the extremity: gape reaching half way to beneath the middle of the eye. Jaws scarcely protractile; the upper one a little the longest: lips reflexed in the form of membranaceous flaps, especially the lower one, the margin of which is sinuous. Teeth ranged in a single row in each jaw. Those above form a numerous, close-set, nearly even series at the sides of the jaw, with two long hooked canines in front; the lateral teeth amount to about thirty-five on each side, and are small, but strong, somewhat conical, and not very sharp-pointed. In the lower jaw there are two front canines, similar to those in the upper, but much smaller; then



follow four short conical teeth; then six large triangular, compressed, sharp-pointed ones, but not all of equal size; then five more small conical ones, which complete the series on each side. No teeth on the vomer or palatines. Eyes of moderate size, situate in the middle of the length of the head, high, but not touching the line of the profile; their diameter one-eighth the length of the head. Preopercle rectangular. Opercle triangular, the membrane produced posteriorly at the upper part in the form of a rounded angle: a short row of scales observable along its upper margin, and another along its lower. Subopercle and interopercle without scales. Also a short row of scales, similar to those on the opercle, behind and partially beneath each eye, and, with these exceptions, no other scales on the head. Above each eye is an irregular row of minute pores: there are also pores beneath the eye, and on the sides of the snout, mixed with short raised lines having somewhat the appearance of written characters. Gill-opening widely cleft; the branchial membrane free all round.

Scales on the body moderately large, and similar in form to those of the *C. auratus*, as described by Cuvier and Valenciennes. The number, in a longitudinal line from the gill to the caudal, is forty-six, in a vertical about seventeen. Lateral line also as in that species, but with the mucous tubes branched, and giving off eight or nine twigs on each side.

The dorsal commences a little behind the terminating angle of the opercle, and the anal immediately beneath the first branched ray of the dorsal: these fins terminate in the same vertical line, and the last ray in each is double: the simple rays are soft and flexible. Caudal slightly rounded. Pectorals short, and obliquely truncated, contained eleven and a half times in the entire length. Ventrals very small, about two-thirds the length of the pectorals, rounded, close together, with an elongated scale between them; their point of insertion slightly backward than that of the pectorals.

COLOUR.—Not noticed in the recent state. In spirits, it appears of an almost uniform dark brown, at least above the lateral line. There is some trace of a pale longitudinal band on each side of the head beneath the eye, which is continued, but rather indistinctly, along the whole length of the body, the tips of the scales remaining dark. Possibly during life all the lower part of the sides and belly may have exhibited numerous dark spots upon a pale or silvery ground. Under part of the head pale brown, with some faintly-defined ocellated spots: also a faint trace of red on the opercle. All the fins pale brown, without spots.

#### Habitat, Japan?

This species was given to Mr. Darwin, when at Chiloe, by the surgeon of a whaling-ship, who said that he believed that it was caught in the Japan seas. From the great similarity which prevails amongst the species of this genus, I am not sure that it is really new, as I have ventured to consider it. The specific character also, so far as the colours are concerned, must be received with some caution, in consequence of these last not having been observed in the recent state. It seems to approach very closely the *C. hemichrysos* of Cuvier and Valenciennes, brought by MM. Quoy and Gaimard from the Sandwich Islands; but it differs in its colours, especially in the fins being all uniformly pale brown, and in having fewer scales on the opercle, and beneath the eye. It is impossible



to say, however, to what extent the colours may have been altered by the spirit: some of the scales also may have been rubbed off.

CHROMIS FACETUS. *Jen.*

*C. supra virescenti-niger, lateribus pallidioribus: dorso modice arcuato; fronte elevato, rostro summo ante oculos paululum excavato: limbo preoperculi poris quatuor conspicuis impresso: squamis latis, marginibus liberis levissime ciliatis: spinis dorsalibus quindecim, analibus sex: pinnis ventralibus longe acuminatis, ad analem pertingentibus: pinnâ caudali subæquali.*

D. 15/10; A. 6/8; C. 16, &c.; P. 14; V. 1/5.

LONG. unc. 5. lin. 9.

FORM.—Oblong-oval, very much compressed; the back moderately elevated, and more curved than the abdomen. Greatest depth a little behind the insertion of the pectorals, and contained twice and three-quarters in the entire length: thickness about two-fifths of the depth. Forehead high: profile falling very obliquely, and slightly hollowed out in front of the eyes; the upper and under profile meeting at the mouth at nearly a right angle. Head contained not quite four times in the entire length; its own length and height nearly equal. Mouth small, protractile: jaws about equal, the lower one, if anything, a little the longest: lips not very fleshy. Maxillary rather slender, retiring almost entirely, when the mouth is closed, beneath the sub-orbital, the anterior margin of which is slightly hollowed out, and somewhat sinuous. Teeth in card in both jaws, forming a narrow band; the outermost row longer and stronger than the others, especially the four or six middle ones in front, which are somewhat conical and slightly hooked. Pharyngean teeth present, but none on the vomer or palatines. Eyes rather small, their diameter about one-fifth the length of the head; high in the cheeks, and a little nearer to the snout than to the posterior margin of the opercle: the space between broad, equalling nearly two diameters and-a-half. Nostrils consisting of a single round orifice half-way between the eye and the end of the snout. Preopercle with the basal margin short, and forming a slightly obtuse angle with the ascending one, the margin of which is entire. Opercle of a triangular form, broad at top, but narrowing off towards the bottom. Subopercle and interopercle much developed; their outer margins, taken together, rounded off nearly in a semicircle. Branchial membrane quite free all round, unattached to the isthmus, and but slightly emarginate. Snout, suborbital, jaws, and limb of the preopercle, naked; but the cheeks and rest of the opercular pieces scaly: the scales on the subopercle large. Four large pores on the limb of the preopercle, preceded by three others beneath the lower jaw: similar pores beneath the eye, and extending partially round it; one on the crown of the head, and a few smaller ones scattered about the snout; a large one just above the opercle, and another higher up on each side of the nape.

Scales on the body large; about twenty-five or twenty-six in a longitudinal row, and eleven or twelve in the depth; broader than long, with the free edges very minutely ciliated, the concealed portions with a fan of thirteen striæ, and the basal margins with twelve distinct



crenatures. Lateral line interrupted; its first portion at the depth of two and a half rows of scales beneath the dorsal, and stopping beneath the commencement of the soft part of that fin; recommencing three rows lower down, exactly in the middle of the depth, whence it runs straight to the caudal.

Dorsal commencing above the opercle; the spinous portion of nearly uniform height, and scarcely more than one-fifth of the depth; the soft portion much higher, and terminating in a sharp point behind. Anal answering to the posterior half of the dorsal, terminating opposite to it, and similarly pointed; with six spines, which, as well as the dorsal spines, are furnished with very conspicuous filamentous tags. Caudal nearly even. Pectorals rounded, but not very broad, their length rather more than three-fourths that of the head; the rays rather slender. Ventrals pointed; the first soft ray elongated, and reaching to the anal when laid back; the last ray attached at its base by a membrane to the abdomen. Rows of small scales between the rays of the caudal at the base of the fin; and a few small ones along the base of the dorsal and anal, more particularly on the soft portions.

COLOUR.—“Above, greenish black; the sides paler; slightly iridescent.”—D.—In spirits it appears of a nearly uniform brown all over, fins included.

Habitat, Maldonado, Rio Plata.

Mr. Darwin obtained this species at Maldonado, in a lake of fresh water, said sometimes to be a little brackish. It appears to belong to the genus *Chromis* of Cuvier, placed by him amongst the *Labridæ*, but having evidently very strong affinities to some of the *Sciænidae*. It differs essentially from the *C. Brasiliensis* of Quoy and Gaimard,\* in having six anal spines, and being destitute of all markings and spots. I am not aware that it is described by any author.

#### 1. SCARUS CHLORODON. *Jen.*

##### PLATE XXI.

*S. æruginoso cyaneus, capite et pinnis flavo-vittatis: maxillis exterius lævibus, marginibus crenatis; caninis ad angulos oris nullis: fronte gradatim proclivi: lineâ laterali tubis parum ramosis: squamis ubique striato-granulatis: pectoralibus acuminatis, radiis superioribus arcuatis: caudali radiis externis cæteris longioribus, acuminatis.*

D. 9/10; A. 3/9; C. 13. &c.; P. 15 vel 16; V. 1/5.

LONG. unc. 16.

FORM.—Of an oval form; the greatest depth one-third of the length, caudal excluded: dorsal and ventral lines equally convex. Head a little less than the depth of the body, not gibbous in front, but with the profile falling regularly and gradually from the commencement of the dorsal. Snout rather pointed. Jaws equal, their outer surface smooth, but crenated on their cutting edges. No spinous canines at the corners of the mouth. Eyes rather small, their diameter not one-fifth the length of the head, situate above the middle of the cheek, but equidistant from the posterior lobe of the opercle and the extremity of the snout. Snout in front of the eyes, and

\* *Freycinet Voyage, (Zoologie)* p. 286.



the lips, naked; but the cheeks and opercular pieces covered with large scales, which form two rows on the cheeks. Opercle terminating behind in a rounded angle. Scales on the body very large; eight in the depth, and twenty-one or twenty-two in the length: the entire exposed portion of each scale scabrous with granulations, which are partially disposed in lines towards the free edges. No scales on the vertical fins. The lateral line occupies the second row of scales from the top, till it reaches a little beyond the end of the dorsal, where it becomes interrupted, recommencing in the fourth row, which at this point is the third: tubal pores in some places ramified, but the ramifications not very distinct.

The dorsal commences above the posterior lobe of the opercle, and is of nearly uniform height throughout. The length of the rays in the soft portion, which is slightly higher than the spinous, is not quite one-third of the depth. The whole length of this fin is half the entire length. The anal answers to the last half of the dorsal, and terminates in the same line; the three spines are slender, and the first very short. Caudal with the central portion slightly convex, but the three outer rays above and below prolonged into a point one-third the length of the whole fin; the lower point a little longer than the upper. Pectorals about one-fifth of the entire length, pointed, with the upper rays arcuate. Ventrals immediately beneath them, one-third shorter.

COLOUR.—“Fine verditer blue, with some yellow stripes about the head and fins.”—D.—The dried skin is nearly of a uniform brown, but the snout and cheeks are much varied with green: the jaws also are green. A bright green patch in front of the eye, immediately beneath which is a pale frænum, probably yellow in the recent state. Dorsal and anal green: the former shews some trace of a lighter narrow band running longitudinally below the upper edge of the fin; the latter exhibits a very distinct fascia running along the middle. Caudal pale green, with the upper and lower edges of a much deeper tint. Ventrals in like manner edged with green. Pectorals wholly dusky.

Habitat, Keeling Island, Indian Ocean.

In so extensive a genus as the present, and one in which so much general similarity prevails amongst the species, the task of determining whether any particular one has been described before is extremely difficult. I can only say that the species which I have here ventured to characterize as new has been carefully compared with the descriptions of all those noticed in the “*Histoire des Poissons*,” and though there are several to which it is nearly allied, there is none to which it can be referred with certainty. It seems to approach nearest the *S. variegatus*, but that species is said to have the caudal square, by which I presume is meant that the upper and under rays are not prolonged into a point, as is the case in so many species of this genus, and in the one here described.

This species was taken by Mr. Darwin at the Keeling Islands.

## 2. SCARUS GLOBICEPS. *Cuv. et Val.*

*S. globiceps*, *Cuv. et Val.* Hist. des Poiss. tom. xiv. p. 179.

FORM.—Oblong-oval, very much compressed throughout: the dorsal and ventral lines nearly of equal curvature. Greatest depth contained about three times and one-third in the entire



length: thickness twice and three-fifths in the depth. Head one-fourth of the entire length, rather elevated at the nape, the forehead convex, whence the profile descends nearly in the arc of a circle, giving the snout a blunt and rounded appearance. The height of the head, taken in a vertical line through the eyes, equals nearly but not quite its own length. Mouth small, the gape not reaching half-way to the eye. Jaws very slightly crenated on their cutting edges, the true teeth appearing on the outer surface like minute scales. At the posterior angle of each jaw, and on each side, are two sharp canines projecting horizontally from the corners of the mouth, eight in all. Eyes rather small, their diameter contained six-and-a-half times in the length of the head, situate a little above the middle of the cheek, and a trifle nearer the extremity of the snout than the posterior margin of the opercle. The nostrils consist of two minute orifices a little in advance of the eye, and a little distant from each other, the posterior one largest and kidney-shaped, the anterior round and nearly closed by its membranous border. A cluster of minute pores above and behind the eyes, and a few others scattered about the snout.

Scales on the body very large, increasing in size at the base of the caudal, where there are three very large ones covering the rays of that fin for half their length or more: twenty-three in a longitudinal line, and nine in the depth. Each scale of a roundish form anteriorly, the basal portion with a projecting lobe in the middle of the hinder margin, and with thirty-one striæ in the fan; the exposed portion finely striated and granulated, with a broad membranaceous border: those on the caudal nearly three times as long as broad, but the ordinary ones with the length and breadth nearly equal. Lateral line interrupted; the upper portion running nearly straight at about one-fourth of the depth, till opposite the end of the dorsal, where it inclines downwards: tubal pores very distinctly ramified.

Dorsal very low, its height, in the middle of its length, being scarcely more than one-eighth of the depth: the soft rays slightly higher than the spinous, and increasing in length backwards. Anal answering to the last half of the dorsal, and terminating in the same line: three spines at its commencement not stouter than the soft rays, the first very small. The last soft ray in both dorsal and anal double. Caudal with the points about one-fourth of the rest of its length; when spread, the interval is rectilineal, but when the rays are closed the whole appears crescent-shaped. Pectorals a little shorter than the head, of a somewhat triangular form, the rays gradually decreasing in length from the uppermost to the lowermost. Ventrals pointed, about two-thirds the length of the pectorals, and immediately beneath them. A large oblong lanceolate scale between the ventrals, nearly half their length: also an oblong scale in the axilla of each, equalling the last of the soft rays.

D. 9/10 ; A. 3/9 ; C. 13, &c. ; P. 13 ; V. 1/5.

Length 11 inches.

COLOUR.—Not noticed in the recent state. In spirits, it appears bluish grey on the back and sides with small round whitish spots, the margin of each scale being defined by a purplish line; paler on the belly: a white transverse line in front of the eyes passing from one to the other; anterior part of the snout, mouth, cheeks, and lower part of the head, yellowish white. Dorsal and anal pale, the former with three narrow longitudinal purplish lines, the latter with one. A portion of the under surface of the pectorals, extending from the third to the fifth ray, and



forming a longitudinal fascia, purple; the rest of those fins, as well as the caudal and ventrals, pale or nearly colourless.

Habitat, Tahiti.

This species was taken by Mr. Darwin at Tahiti. It so nearly answers to the description of the *S. globiceps* of Valenciennes, brought by MM. Garnot and Lesson from the same locality, that I cannot suppose it to be distinct. This specimen, however, appears to have more spinous teeth at the corners of the mouth.

### 3. SCARUS LEPIDUS. Jen.

*S. fuscus, capite et pinnis purpureo-cæruleo tinctis: fronte parum elevato, æque ac rostro continue et gradatim proclivi; hoc apice obtuso: maxillis exterius lævibus, marginibus vix crenatis; canino ad angulum oris in maxillâ inferiore unico, in superiore nullo: lineâ laterali distinctè ramosâ: pectoralibus subtriangulis: caudali subæquali, radiis externis mediis vix longioribus.*

D. 9/10; A. 3/9; C. 13, &c.; P. 13; V. 1/5.

LONG. unc. 8. lin. 7.

FORM.—General form not very dissimilar to that of the last species, but the crown and nape less elevated, whence the profile falls in a more gradual slope: snout, nevertheless, blunt at the extremity. Depth of the body very nearly one-third of the entire length. Head about one-fourth of the same. The height of the head is about four-fifths of its own length. Jaws smooth externally, the true teeth appearing like minute scales on their surface, the cutting edges scarcely at all crenated: only one laterally projecting canine at each corner of the lower jaw, none in the upper. Diameter of the eye one-sixth of the head.

Dorsal not quite so low as in the last species; its height in the middle of its length about one-seventh of the depth. Caudal nearly even, the upper and lower rays being scarcely longer than the others. Pectorals and ventrals similar, but the scale between the latter shorter and more rounded. Scales on the body large, the free portions finely striated and granulated, with a broad membranaceous border: three large ones at the base of the caudal, as in the last species. Lateral line distinctly branched, the ramifications irregular and varying on each scale; in some instances only one long stem extending nearly to the margin of the scale, with one or more lateral twigs; in others, two, three, or even four distinct stems, either simple or ramified.

COLOUR.—(*In spirits.*) Of a nearly uniform dark brown, with some faint traces of purplish blue about the head and fins, which possibly may have pervaded some parts of the body also in the recent state.

Habitat, Tahiti.

This species was taken with the last, and notwithstanding it presents two or three obvious differences in respect of form, as well as of colour, it is just possible it may be the same in a younger state. I think it not improbable that the points of the caudal may elongate with age, the forehead become more gibbous, and the



spinous teeth more numerous. If it be distinct it would seem to be undescribed ; though the colours not having been noticed in the recent state renders it difficult to speak with certainty on this point. For the same reason, the specific character may perhaps hereafter be found to require alteration.

#### 4. SCARUS ——— ?

Mr. Darwin's collection contains another species of *Scarus* from the Keeling Islands, which may probably be distinct from all those hitherto noticed, but which being in rather a bad state of preservation, I shall content myself with describing as well as I can, without affixing any name to it, lest in the end it prove not new. Many of the species enumerated in the "Histoire des Poissons" having only their colours noticed, it requires that these should have been observed more in detail than what Mr. Darwin's notes furnish in this instance, in order to decide whether it be identical or not with any of those spoken of in that work.

FORM.—A tolerably regular oval, somewhat attenuated at each extremity: dorsal and ventral lines of equal curvature. Nape not at all elevated, and the profile on the whole falling very regularly and gradually from thence to the end of the snout, though there is a slight eminence on the forehead. Depth one-fourth of the entire length. Jaws smooth externally, but with the true teeth very distinct upon their surface, and much more so upon their cutting edges than in either of the last two species. One horizontally projecting canine at each corner of the upper jaw, but none in the lower. The terminating lobe of the opercle is slightly emarginated behind, the membrane projecting immediately above the notch in the form of a short salient point. Lateral line interrupted, the upper portion nearly straight, and not inclining downwards at its posterior extremity: the tubes very slightly ramified, and many of them quite simple. The scales on the body are very finely granulated and striated: there are no large ones at the base of the caudal. Dorsal and anal low: height of the former contained four and a half times in the depth of the body, and exactly equalling the distance from the upper edge of the back to the lateral line. Pectorals somewhat triangular, the uppermost ray of all a little arcuate. Scale between the ventrals one-third the length of those fins. Caudal slightly crescent-shaped, when the rays are closed: when spread, all the middle rays appear even, the uppermost and lowermost projecting very slightly beyond them.

D. 9/10 ; A. 3/9 ; C. 13, &c. ; P. 14 ; V. 1/5.

Length 6 inches.

COLOUR.—"Body dull reddish and greenish, the colours being blended and mottled: fins banded lengthwise with vermillion-red: head with waving bright green lines."—D.—No trace of bright colours remains in its present state, and the only indication of markings is a narrow crescent-shaped band across the middle of the caudal.



## MALACOPTERYGII.

## FAMILY. SILURIDÆ.

1. PIMELODUS GRACILIS. *Val.*

*Pimelodus gracilis*, *Val.* in D'Orb. Voy. dans l'Amer. Mérid. Atl. Ichth. Pl. 2. fig. 5.

————— *Cuv. et Val.* Hist. des Poiss. tom. xv. p. 134.

FORM.—Of a slender elongated form, the body compressed behind the dorsal. Greatest depth contained about seven and a half times in the entire length: thickness at the commencement of the dorsal a little less than the depth. Head, measured to the gill-opening, rather more than one-sixth of the entire length: its breadth two-thirds of its own length. Helmet smooth, and not very conspicuous, though with its whole surface finely wrinkled: its breadth behind the eyes rather more than one-third of its length, measuring this last from the end of the snout to the further extremity of the interparietal process. The solution of continuity extends back nearly to the base of the process just mentioned, which last is narrow and lanceolate, three times as long as broad at its base, but not reaching to the buckler, or triangular plate in front of the dorsal, by one-third of its own length. The buckler itself is not very large, but sufficiently obvious.

Profile sloping gradually downwards in nearly a straight line from the beginning of the dorsal to the end of the snout: this last depressed and rounded horizontally in the form of a semicircle. Mouth wide, but very little cleft, the commissure not reaching half way to the eye. Upper jaw projecting a very little beyond the lower. In each a band of very fine velutine teeth; but none on the vomer or palatines. Tongue smooth, and fastened down all round. Six barbules; the maxillary pair very long, reaching to the commencement of the anal fin; of the submandibular pairs, the exterior reach one-third beyond the insertion of the pectorals; the interior are only half the length of the exterior. Eyes round, of moderate size, their diameter four and a half times in the length of the head, situate in about the middle of the length: distance from one to the other one diameter and a quarter. Lateral line nearly straight throughout its course, dividing the body longitudinally into two nearly equal portions.

Pectorals not quite equalling the length of the head, and a little less than one-sixth of the entire length: the spine very little shorter than the soft rays, very strong, with sharp teeth on its inner edge, but the outer edge only granulated, or with a few slight serratures towards the extremity. The humeral bone seen above the pectoral projects backwards in the form of a spinous lamina, but does not appear through the skin; it equals half the length of the pectoral itself. The dorsal commences at one-fourth of the entire length, and is of a somewhat rectangular form, the soft rays not decreasing much backwards: its length equals four-fifths of the depth of the body, and two-thirds of its own height. The spine is not so strong as that of the pectoral, and with only a few small serratures on the outer edge near the tip. The space between the dorsal and the adipose a little exceeds the length of the former. The adipose



itself is twice the length of that fin; very low at first, but gradually rising, until, before its termination, it becomes equal to between one-half and one-third of the depth. The vent is in the middle of the entire length, caudal excluded. Anal short, and just beneath the middle of the adipose, there being about one-fourth of this last fin in advance of it as well as behind it: the first four rays simple, but apparently all articulated, the first two or three very minute and not easily observed. Caudal forked for two-thirds of its length: the upper lobe a little longer than the lower, and contained five and a half times in the entire length. Ventrals immediately beneath the last ray of the dorsal; a little shorter than the pectorals, and not reaching to the anal by half their own length.

D.  $1\frac{1}{6}$ ; A. 14 or 15; C. 17, &c.; P.  $1\frac{1}{9}$ ; V. 6.

Length 5 inches 2 lines.

COLOUR—(*In spirits*.) Brownish, inclining to silvery in some places: a dusky fascia formed of dots along the lateral line. Dorsal rather dusky at the base, and with the upper portion also dusky between the rays: a dusky spot on the anterior part of the adipose.

Habitat, Rio de Janeiro.

This species was taken by Mr. Darwin in a running brook at Rio de Janeiro. It approaches on the whole so nearly the *P. gracilis* of D'Orbigny, that I can hardly suppose it to be distinct. Yet there are some slight differences observable in this specimen. It has more anal rays; the adipose appears shorter; and the upper lobe of the caudal is not so prolonged, though possibly it may be worn down. Also D'Orbigny's figure appears to want the dusky stains on the dorsal and adipose fins. If it be not that species it must be new, as there is none other described by Cuvier and Valenciennes with which it will assimilate better.

## 2. PIMELODUS EXSUDANS. *Jen.*

*P. corpore parum elongato, altitudine quintam partem longitudinis æquante: galeâ lævi, inconspicuâ, processu interparietali haud clypeum parvum prædorsalem attingente: poris paucis buccalibus amplis, serie obliquâ dispositis: maxillis æqualibus: cirris sex; maxillaribus haud analem attingentibus: lineâ laterali primum deflexâ, deinde rectâ: pinnis dorsali et anali brevibus; adiposâ dorsali haud duplo longiore: caudali profundè bifurcâ, lobis æqualibus: spinâ pectorali margine interno fortiter dentato.*

D.  $1\frac{1}{7}$ ; A. 13 vel 14; C. 17, &c.; P.  $1\frac{1}{8}$ ; V. 6.

LONG. unc. 3. lin. 6.

FORM.—In some respects resembling the last species, but the body much less elongated, the depth and thickness remaining the same. The depth is about one-fifth of the entire length; the head rather more than one-fifth. The helmet is scarcely so much wrinkled, and the interparietal process not so long, reaching only half-way to the buckler, which last is smaller and less obvious. The solution of continuity of the bones of the cranium appears to extend back



in the form of a narrow fissure nearly to the base of the interparietal process, but is not very obvious, except between the eyes, where it opens into a sort of elongated ellipse. There are eight or nine pores on the top of the head, rather behind the eyes, so arranged as to form nearly a complete circle. There is also a very conspicuous row of three or four large oval pores on the cheek, at the anterior part of the opercle, descending obliquely forwards: other smaller ones may be seen scattered about different parts of the head. The jaws are equal: the teeth as in the last species, excepting that a roughness can be distinctly felt upon the vomer beneath the skin, though there are no teeth on that part which appear through it. The maxillary pair of barbules reach to a point midway between the insertion of the ventrals and the commencement of the anal: of the submandibular pairs, the exterior do not reach beyond the insertion of the pectorals; the interior are two-thirds the length of these. Eyes elliptical, the longitudinal diameter about one-fifth the length of the head; situate nearer the end of the snout than the posterior part of the opercle; the interval between them nearly two diameters. The lateral line slopes downward till opposite the fourth soft ray of the dorsal, then passes off straight along the middle to the caudal.

The pectorals are contained about five-and-a-half times in the entire length. The spine is similar to that of the last species; but the humeral bone is shorter, and scarcely one-third of the pectoral itself. The dorsal is similar; and the space between it and the adipose is the same; but the adipose itself, though of the same form, is not so long, from the body being less elongated; it is not more than half as long again as the dorsal. Anal similar, but the adipose not advancing so much beyond it. Caudal and ventrals similar; but the former with the lobes equal.

COLOUR.—(*In spirits.*) On the whole similar to, but darker than that of the last species. There is some appearance of a fascia along the lateral line. The upper part of the dorsal, and also of the anal, is dusky, but there is no spot on the adipose. Pectorals and ventrals dusky.

A second specimen differs from the above in no respect, except in being smaller, measuring two inches and a quarter in length, and in having one ray more in the anal.

Habitat, Rio de Janeiro?

The number annexed to this species has been lost, but there is reason for believing that Mr. Darwin took it with the last at Rio de Janeiro. I cannot identify it with any of those described by Cuvier and Valenciennes in the "*Histoire des Poissons.*"—It affords another instance of the indefiniteness of the character derived from the presence or absence of vomerine teeth; since a band of such teeth, which are considered by Valenciennes as absent in this genus, can be distinctly felt and made obvious by removing the skin of the palate, though they do not appear externally. This is not the case with the species last described, to which nevertheless, the present one approaches so closely in general character, that they never could be widely separated. Except for the greater elongation of the body in the *P. gracilis*, I should have been almost inclined to consider them as sexes of the same species.



CALLICHTHYS PALEATUS. *Jen.*

*C. capite compresso lævi: ore parvo, cirris maxillaribus ad utrumque angulum duobus, haud ultrà oculos pertingentibus; labro inferiore reflexo, et in duos cirros breves membranaceos producto: spinâ pectorali compressâ, forti, margine interno leviter dentato, externo lævi, quintam partem totius longitudinis æquanti: caudali bifurcâ, lobis æqualibus acuminatis.*

D.  $1\frac{1}{7}$ —1; A. 6; C. 14, &c.; P.  $1\frac{1}{7}$ ; V. 6.

LONG. unc. 1. lin. 10.

FORM.—General form resembling that of the *C. punctatus*. Depth, at the commencement of the dorsal, one-third of the length, excluding caudal: thickness at the pectorals three-fourths of the depth. Head slightly compressed, its height very little less than its length, this last, measured to the gills, being rather less than one-fourth of the entire length. Profile falling from the dorsal in one regular slope, and nearly rectilinear till it arrives before the eyes, where it curves downwards, making the extremity of the snout obtuse. Mouth small, the upper jaw a little projecting; two maxillary cirri at each angle; these nearly equal; the lower one a little the longest, reaching to beneath the middle of the eye: also two short cirri, only half the length of the maxillary ones, pendent from the reflexed lower lip, a little separate from each other, one on each side the middle. Teeth so minute as hardly to be distinguished; a row can just be felt on each jaw, and on the vomer. Head smooth. The number of dorsal laminae twenty-one; that of the ventral twenty.

Pectorals a little exceeding the length of the head; the spine nearly as long as the fin itself, but not exceeding one-fifth of the entire length; very strong, compressed, and sharp-pointed, with a few fine teeth or serratures on the inner margin, but smooth on the outer. Height of the dorsal more than half the depth, and a little more than its own length, this last equalling the space between it and the adipose: the spine strong, and similar to that of the pectoral. Anal directly underneath the adipose, and hardly occupying more space. Ventrals shorter than the pectorals, attached beneath the last third of those fins, or under the second soft ray in the dorsal, and scarcely reaching more than half-way to the anal: the first ray, as well as that of the anal, somewhat hispid. Caudal forked for half its length, which about equals that of the head: the lobes equal and pointed.

COLOUR.—(*In spirits.*) General colour yellowish-brown, with dusky spots and mottlings: breast and edge of the abdomen whitish. Pectorals, ventrals, and anal, almost wholly dusky: dorsal and caudal spotted.

This species, in its general character, approaches so extremely near the *C. punctatus* of Valenciennes, that perhaps I am in error in considering it distinct. But it is remarkable for possessing, in addition to the four usual maxillary cirri, two labial, which are neither represented in D'Orbigny's figure,\* nor noticed in the description given in the "*Histoire des Poissons*," and which therefore I infer are not present in that species, as they could hardly have been overlooked, or been deemed unimportant to be noticed. The maxillary cirri also, which in the *C. punctatus*,

\* *Voy. dans L'Amér. Mérid. Atl. Ichth. pl. 5. fig. 1.*



reach, according to Valenciennes, to the gill-opening, if not beyond it, here only attain to beneath the middle of the eye; and this character is invariable in five specimens which Mr. Darwin has brought home. Judging from the description, there would seem to be one or two further differences: the profile appears to be more rectilineal, the pectoral spine shorter, and smoother on its external margin. The colours are on the whole similar, but the pectorals and ventrals darker: the latter, which are said to be yellow in the *C. punctatus*, are here quite dusky in every one of the specimens.

The exact locality in South America in which Mr. Darwin obtained this species is uncertain, as the specimens have lost their attached labels.

#### FAMILY.—CYPRINIDÆ.

##### 1. PÆCILIA UNIMACULATA. *Val.*

*Pæcilia unimaculata*, *Val.* in *Humb. Zool. et Anat. Comp.* vol. ii. p. 158. pl. 51. fig. 2.

FORM.—Body oval, slightly elongated, thick anteriorly, compressed behind. The dorsal and ventral lines meeting at the mouth at an acute angle; but the head, when viewed from above, broad, and very much flattened between the eyes, and the snout obtuse. Greatest depth about one-fourth of the entire length: thickness two-thirds of the depth. Length of the head nearly equalling, or a little less than, the depth of the body. Mouth small: jaws very protractile; each with a single row of very fine, close-set, pointed teeth; the lower one a trifle the longest. Eyes large, their diameter three and a half times in the length of the head, high in the cheeks, reaching to the line of the profile. Nostrils consisting of one small orifice a little above and rather in advance of the eyes.

Scales large, investing the head and all the pieces of the gill-cover, though very thin and transparent on the opercle and not very obvious there. On the body there are about eight in the depth, and twenty-seven or twenty-eight in a longitudinal row from the gill-opening to the caudal. One taken from the middle of the side found to be of a semi-elliptic form, the exposed portion marked with numerous very fine curved concentric lines, the basal with sixteen or seventeen deeper-cut nearly parallel striæ gradually lengthening from the sides towards the middle, but not converging to a fan. Lateral line very faintly marked out by a dotted line, scarcely obvious in some places.

Dorsal small, commencing exactly at the middle point of the entire length, measuring this last quite to the extremity of the caudal. Anal similar and opposite; in strictness, however, terminating a very little in advance. The last ray in both these fins double: the first two in the anal short. Caudal rounded. Pectorals and ventrals small and narrow, the former three-fourths the length of the head; the latter not above half the same. The pectorals, when laid back, reach to the insertion of the ventrals, but the ventrals hardly reach to the commencement of the anal.

B. 5; D. 7; A. 9; C. about 24, including short ones; P. 14 or 15; V. 6.

Length 2 inches.



COLOUR.—Greenish-brown, with a conspicuous black spot on the middle of each side, a little in advance of the commencement of the dorsal. Dorsal a little dotted and mottled with dusky, especially towards the tips of the rays. The other fins plain.

Habitat, Rio de Janeiro.

This species, which was discovered by Humboldt, was observed by Mr. Darwin in great numbers in fresh-water ditches at Rio de Janeiro: others were taken in equal plenty in a salt lagoon. The bellies of the females are very turgid when big with young, which are said to be excluded alive, and yellowish.—Valenciennes, in his description, speaks of the opercle as being smooth, or without scales, though he says the preopercle is covered with scales; and he would lead one to suppose that they are absent on this part in the whole genus, as it enters into his generic character; I find them, however, present, though very thin and transparent, both in this species and the next.

The general resemblance which *Pæcilia* bears to *Mugil*, as regards the form of the head and mouth, is very striking, and calls up irresistibly the idea of some relation of analogy between these two genera.

## 2. PÆCILIA DECEM-MACULATA. Jen.

PLATE XXII. Fig. 1.

*P. corpore sub-elongato, viridescenti-fusco; lateribus maculis nigris circiter decem serie longitudinali dispositis; pinnis immaculatis: dentibus subincisivis: caudali subtruncatâ.*

D. 8; A. 10; C. 22, brevibus inclusis; P. 9; V. 5.

LONG. unc. 1. lin. 4.

FORM.—More elongated than the last species; the snout not so acute when viewed laterally. Depth not more than one-fifth of the entire length, the length of the head being equal to it. Mouth and jaws similar; the teeth also in one row in each jaw, and forming a compact series, but more incisor-like than pointed, with oblique cutting edges. Scales of a different form and sculpture; more oblong than semi-elliptical, broader than long; the deep striæ behind more numerous, amounting to twenty or more, and all drawn nearly of the same length. They cover all the pieces of the opercle as in the *P. unimaculata*.

Dorsal and anal exactly opposite, commencing at a point a little anterior to the middle of the entire length, reckoning this to the extremity of the caudal. Caudal rather more approaching to square than rounded; the number of rays fewer than in the last species. Pectorals narrower, having also fewer rays. Ventrals very small, scarcely more than half the length of the pectorals. When laid back, the pectorals reach to beyond the insertion of the ventrals: the ventrals do not attain to the anal.

COLOUR.—Greenish-brown, with about ten conspicuous somewhat oval-shaped dusky spots, arranged in a longitudinal line along the middle of each side. All the fins plain.

Habitat, Maldonado.

This, which is evidently a new species of *Pæcilia*, was taken by Mr. Darwin



at Maldonado, in a lake that had been suddenly drained. There are three specimens in the collection, none of them exceeding the length above given. Mr. Darwin, however, states in his notes, that he believes them to be full grown, having taken them so repeatedly, in brooks, of the same size. The number of spots varies from nine to twelve, and is sometimes different on the two sides of the same specimen.

Independently of the spots, which at once characterize this species, it is readily distinguished from the last by its teeth, which are more cutting than pointed, and in this respect rather departing from the character of the genus as established by Valenciennes.

1. *LEBIAS LINEATA*. *Jen.*

PLATE XXII. Fig. 2.

*L. corpore subelongato, subcompresso, viridescenti-fusco; lateribus lineis circiter septem longitudinalibus nigris, e maculis parvis subconfluentibus formatis: dentibus uniseriatis: caudali rotundatâ.*

D. 9; A. 9; C. 26, brevibus inclusis; P. 13; V. 6.

LONG. unc. 1. lin. 10.

FORM.—General form very similar to that of the *Pæcilia decem-maculata*. Slightly compressed; the depth one-fifth of the length; the length of the head about four-and-a-half times in the same. Head depressed: snout obtuse: mouth small; the commissure horizontal. Upper jaw very protractile; the lower one rather the longest, when the mouth is shut. Teeth forming a single closely-set series, somewhat compressed at bottom, the cutting edges tricuspid. Diameter of the eye nearly one-fourth the length of the head. Some large conspicuous pores on the lower jaw, passing upwards in a series along the margin of the preopercle, not very near together, about eight or nine in all.

Scales large, covering the head and all the pieces of the gill cover, as well as the body. About eight in the depth, and thirty in a longitudinal line from the gill to the caudal. One taken from the middle of the side of a semi-elliptic somewhat oblong form; the free portion very finely striated, the basal with ten or twelve deeper-cut striæ, these last nearly parallel, and of equal lengths. Lateral line faintly marked out by a dotted line; the first half in the third row of scales from the top, the last half in the fourth row.

Dorsal commencing at exactly the middle point of the entire length. Anal opposite and similar. Caudal rounded. Pectorals small, about two-thirds the length of the head. Ventrals smaller, barely one-half of the same. The pectorals, when laid back, reach to the insertion of the ventrals; but the latter hardly attain to the anal.

COLOUR.—Greenish-brown, with six or seven longitudinal dark lines on the sides, the lines apparently made up of spots for the most part confluent, but here and there not so, interrupting the continuity of the lines. All the fins pale dusky, without any spots or markings.

Habitat, Maldonado.

This new species of *Lebias* was taken by Mr. Darwin in the same lake at



Maldonado with the *Pacilia decem-maculata*. There are several specimens in the collection, none of them exceeding the size above mentioned, and they have all the appearance of being full grown. Some have the lines of spots much more interrupted than others.

2. *LEBIAS MULTIDENTATA*. Jen.

PLATE XXII. Fig. 3.

*L. corpore subelongato, subcompresso, viridescenti-fusco; lateribus fasciis angustis paucis longitudinalibus albidis obscurioribus: dentibus seriebus plurimis dispositis, omnibus tricuspidatis: caudali rotundata.*

D. 9; A. 9; C. 26, brevibus inclusis; P. 13; V. 6.

LONG. unc. 3. lin. 2.

FORM.—The general form and proportions of this species are extremely similar to those of the last; but it differs very remarkably in having behind the anterior row of tricuspid teeth, a band of minuter teeth above and below, all of which are also tricuspid, and similarly formed to those in front. Head one-fifth of the entire length; flattened on the crown. Jaws nearly equal; upper one very protractile. Scales large; about thirty-two in a longitudinal line, and eight in the depth; covering all the pieces of the opercle; similar in form to those of the last species, but with the striæ on the free portion finer and more numerous, the deep-cut basal striæ also rather more numerous, amounting to about fourteen, and of unequal lengths, gradually increasing from the outermost to the middle ones. Lateral line similar; also the same pores on the lower jaw. Fins and finray-formula similar: in both species the first and last rays of the dorsal and anal are simple, and shorter than the others. The anal perhaps terminates a little nearer the caudal than the dorsal does.

COLOUR.—(*In spirits.*) Greenish-brown, with very little appearance of markings in its present state. There is, however, some indication of an irregular scattered row of small black spots on each side, a little below the ridge of the back; also of two or three pale longitudinal narrow bands along the middle of the sides, which were probably more conspicuous in the living fish. The belly is yellow, and very tumid; but these are evidently characters merely indicative of the female sex.

Habitat, Monte Video.

This is another new species of *Lebias* taken by Mr. Darwin in fresh-water at Monte Video, if indeed it strictly belong to the genus; but the circumstance of the teeth being in several rows, and in fact forming a complete band, is at variance with the generic characters as given by Cuvier. The teeth however being exactly of the same form as in the other species, and the general characters on the whole similar, I have not thought it expedient to erect it into a new genus. There is but one specimen in the collection, which appears to be a large female big with young.



GENUS—MESITES. *Jen.*

*Corpus elongatum, gracile, antice subcylindricum, postice compressum, nudum, squamis nullis. Caput depressum. Rostrum breve, obtusum: os terminale, rictu modico. Maxillæ debiles; superior margine ex ossibus intermaxillaribus omnino formato, maxillaribus retroductis et a labio partim celatis. Dentes minuti, acuti, in maxillâ utraq̃ue uniseriati; in linguâ et vomere biseriati; in ossibus palatinis et pharyngealibus nulli. Apertura branchialis amplissima, membranâ sex-radiatâ, subter gulam profundè emarginatâ, haud isthmo annexâ. Pinnæ dorsalis et analis valde retropositæ, oppositæ. Pinnæ pectorales et ventrales parvæ. Pinna caudalis leviter emarginata.*

There can be no doubt, I imagine, as to this being an entirely new form, and a very interesting one, from the circumstance of its being at the extreme end of the family to which it belongs, and its very much departing from the usual characters of that family. I have referred it to the *Cyprinidæ*, taking that group in the enlarged view in which Cuvier accepts it; though by those who divide it into subfamilies it would probably be associated with the *Cobitidæ*, or made to constitute a distinct one by itself. It agrees with the *Cyprinidæ* in general in the form of its mouth, in the upper jaw having its margin entirely formed by the intermaxillary, the maxillary being present, but placed behind and partly concealed in the thickness of the lip, and in the want of an adipose; but it altogether departs from that family in the entire want of scales, of which there is not even a vestige in the dried skin, and in which respect it would seem to shew an affinity to the *Siluridæ*. Yet it has none of the other characters of the family just mentioned. On the other hand, in the backward position of the dorsal and anal fins, which are opposite to each other, it agrees with the *Esocidæ*. The pharyngeal bones are unarmed, but this deficiency is made up for by the strong curved teeth on the tongue, independently of the minuter ones in the jaws.

The intestine is extremely short and quite straight, measuring only fourteen lines in length from the pylorus to the anus, in a specimen two inches and a half long. The stomach is of an oval form, of considerable capacity, very membranaceous, with the cardiac and pyloric openings near together at the upper extremity, from the latter of which the intestine is immediately reflexed to pass off to the anus. In the specimen dissected, the stomach was much distended by a nearly perfect individual of the genus *Colymbetes*, which appeared to have been recently swallowed, and was scarcely at all altered. There are no cœcal appendages. The air-bladder is of an elongated oval form, and of considerable development.



Mr. Darwin's collection contains no less than three species of this new genus, differing but slightly from each other. Two are from the most southern parts of South America, the third from New Zealand.

1. MESITES MACULATUS. *Jen.*

PLATE XXII. Fig. 4.

*M. viridescenti-fuscus*; dorso et lateribus maculis crebris, hic et illic confluentibus, nigris; ventre nivo; pinnarum radiis nigro-punctatis.

B. 6; D. 10; A. 16; C. 16, &c.; P. 12; V. 7.

LONG. unc. 2. lin. 8.

FORM.—Slender and very much elongated. Body anteriorly subcylindrical, compressed behind. Greatest depth not more than one-eighth of the entire length: thickness about three-fourths of the depth. Head rather depressed, about one-sixth of the entire length. Snout short and rounded; mouth at the extremity; the gape moderate, not quite reaching to beneath the anterior angle of the eye. Lower jaw ascending a little to meet the upper, and, when the mouth is open, appearing rather the longest. Intermaxillary fixed, forming the entire margin of the upper jaw, the maxillary being behind it, and, though of nearly equal development, not very distinct: both bones slender. Teeth small, but sharp-pointed, rather widely apart, arranged in a single row along the edge of the intermaxillary, and in the lower jaw; the series above consists of about eighteen, that below of about twenty-one: also a double longitudinal row on the tongue, each row containing five or six teeth, the anterior ones curved, and larger than any of those in the jaws: a similar double row, but of minuter ones, down the middle of the vomer; none, however, on the palatines or pharyngeans. Eyes rather large, their diameter contained about three and a half times in the length of the head, distant scarcely one diameter from the end of the snout. The nostrils appear to consist of only a single aperture in front of the eye, in the neighbourhood of which, and also above the eye, are several large pores. The opercle and subopercle taken together approach to an oblong form, the posterior margin being straight and nearly vertical: the subopercle is not much developed, nor very distinct. Gill-opening very large, the membrane thick, with six rays, deeply notched beneath, and not fastened down. The whole skin is perfectly smooth and naked, invested with mucosity. No appearance of any lateral line, unless a fine dark streak be so called, passing along the middle of the sides, and dividing them into two equal parts.

The dorsal and anal are opposite to each other, and both placed very far back, almost at the extremity of the body. They commence in nearly the same vertical line, a very little anterior to the commencement of the last third of the entire length; but the anal being longer than the dorsal, it extends nearer the caudal. The form of these fins is much as in the genus *Cobitis*. The dorsal has the first three rays simple, the rest branched: the anal also has the first three simple, the first very short. Caudal about one-eighth of the entire length, with a shallow notch, the principal rays branched. The vent is just before the anal. The ventrals arise from about the middle of the entire length, the distance from their insertion to the commencement of the anal being twice their own length. The pectorals are small, and rather narrow, equalling about two-thirds the length of the head or hardly so much: they are attached low down, but not quite so low as in the genus *Cobitis*.



COLOUR.—(*In spirits.*) Greenish-brown, with numerous conspicuous spots and small irregular transverse bars of black. Under a lens the spots appear to be made up of thickly crowded black specks upon a dark brown ground: the bars result from some of the spots being confluent. The belly appears to have been white. The rays of all the fins are dotted with dusky, but the membranes transparent and colourless.

The individual described above was taken by Mr. Darwin in a fresh-water brook, in Hardy Peninsula, Tierra del Fuego. His collection, however, contains four other specimens found in streamlets and creeks high up the river of Santa Cruz in Patagonia, where they are said to have been numerous. Though these last are slightly different, they are evidently referable to the same species: they also vary a little from each other. Their peculiarities are as under:

The largest measures 2 inches 8 lines in length, and has the following fin-ray formula:

D. 12; A. 16; C. 16, &c.; P. 14; V. 7.

The next in size is 2 inches 6 lines, with the fin-ray formula thus:

D. 11; A. 16; C. 16, &c.; P. 13; V. 7.

These specimens agree in being both slenderer than the one from Tierra del Fuego. The depth is eight and a half, if not nine times in the entire length: the head rather more than one-sixth of the same. The colours are similar, except that the spots are not quite so numerous, and of a more regular form, seldom running together to form bars.

It is to these specimens that Mr. Darwin's notes refer, respecting the colours of this species in the recent state. As follows: "Pale greenish brown, with small irregular transverse bars of black; belly snow white."—D.

The third of the Patagonian specimens is 2 in. 2 lin. long. Fin-ray formula—

D. 10; A. 15; C. 16, &c.; P. 14; V. 7.

The fourth is of the same length.

D. 11; A. 15; C. 16, &c.; P. 13; V. 7.

These last two specimens are exactly similar to each other in colours, but differ from the former two in being almost immaculate, having only a few spots on the upper part of the back. This brings them very close to the following species, from which they are scarcely to be distinguished, except by their smaller eyes. It should be observed further, that the fleshy part of the tail in these specimens has the upper and under edges fringed with the short accessory rays of the caudal, a character which is not so obvious in any of the others.



2. MESITES ALPINUS. *Jen.*

*M. viridescenti-fuscus, dorso saturatiore; hoc, et lateribus, et pinnis, nigro levissimè irroratis, immaculatis; ventre niveo; oculis majusculis.*

D. 10; A. 16; C. 16, &c.; P. 13; V. 7.

LONG. unc. 2. lin. 5.

FORM.—Very little difference in form between this and the last species. The eyes, however, are decidedly larger, measuring in diameter one-third the length of the head. The head itself also appears somewhat longer, being nearly one-fifth of the entire length. The anterior teeth on the tongue do not seem much larger than the others. Fins similar.

COLOUR.—(*In spirits*). Greenish brown, deepening in tint at the top of the back. Back, sides, and fins, immaculate, but thickly powdered with minute dark specks, scarcely visible except under a lens. These specks give the fins a more dusky appearance than they possess in the last species. The belly appears to have been white.

A second specimen does not differ from the above in any respect, except in being rather smaller, and scarcely more than two inches in length.

Habitat, Tierra del Fuego.

This species was taken by Mr. Darwin in alpine fresh-water lakes in Hardy Peninsula, Tierra del Fuego. I have no hesitation in considering it distinct from the last, as there are two specimens exactly similar, both shewing a larger eye, and an entire absence of all approach to spots; while the whole surface of the back and sides is thickly irrorated with dark specks, a character which does not appear in the plain varieties of the *M. maculatus*.

3. MESITES ATTENUATUS. *Jen.*

PLATE XXII. fig. 5.

*M. viridescenti-fuscus, ventre vix pallidiore; dorso, et lateribus, pinnarumque radiis, sparsim nigro levissimè irroratis, immaculatis: corpore prægracili, anticè attenuato; capite et oculis minoribus.*

D. 11; A. 17; C. 16, &c.; P. 12; V. 7.

LONG. unc. 2. lin. 6.

FORM.—Rather more slender than either of the last two species, the body more attenuated anteriorly; the head also smaller, though scarcely shorter. Mouth and eyes both smaller; the diameter of the latter not more than one-fourth of the length of the head. Teeth also rather more minute as well as more numerous. The fins are similar, except that the ventrals appear to stand rather more forward, being attached exactly in the middle of the entire length, excluding caudal: the distance from their insertion to the commencement of the anal is more than twice their own length. The outer rays of the caudal are worn, but there was probably a shallow notch when entire: the short accessory rays are very numerous, and form a very distinct fringe along the upper and lower edges of the fleshy part of the tail.



COLOUR.—(*In spirits.*) Greenish-brown, much more uniform than in either of the last two species, not deepening on the back, and scarcely becoming paler underneath. The back, sides, and rays of the fins, are finely irrorated with dusky specks, as in the *M. alpinus*, but not to the same extent, the specks being more thinly scattered, and here and there scarcely visible. From the same cause the fins appear paler.

Habitat, Bay of Islands, New Zealand.

This, which is a very distinct species of this new genus, was taken by Mr. Darwin in fresh-water in the Bay of Islands, New Zealand. It is well characterized by its more attenuated head and smaller eye, than those of either of the two others.

#### FAMILY.—ESOCIDÆ.

##### EXOCÆTUS EXSILIENS. *Bl.?*

*Exocætus exsiliens*, *Bl. Ichth. pl. 397.*

FORM.—Head about one-sixth of the entire length, and approaching to the form of a parallelopiped; very much flattened on the crown and between the eyes quite to the end of the snout, broader above than beneath, so that the cheeks are beyond the vertical inclining inwards at bottom. Snout short: mouth not much cleft; when shut, the jaws are equal, and the commissure of the lips appears to extend to beneath the anterior margin of the eye, but the maxillary, which retires completely beneath the suborbital, does not reach so far: when the mouth is open, the maxillary becomes vertical, and the intermaxillary being scarcely at all protractile, the lower jaw is a little the longest. Teeth very minute: a row, scarcely visible, along the forepart of the intermaxillary, but not extending to the sides of the jaw: none that can even be felt in the lower jaw, or in any other part of the mouth. Tongue rounded, and free at the tip. A loose veil of skin hangs down in front of the palate, from immediately behind the teeth in the upper jaw. Eyes round, and very large; the upper part of the orbit reaching to the line of the profile, and forming a slightly salient ridge: their diameter very nearly one-third the length of the head; between them and the end of the snout is two-thirds of a diameter; the distance from one to the other across the crown is one diameter and a quarter. The nostrils consist of one large round orifice a little in advance of the eyes. The membrane of the opercle forms a slightly salient angle backwards, near the upper part of the gill-opening. Scales large, of a somewhat irregular form, approaching to oblong, nearly twice as broad as long, the posterior margin with three or four incisions near the middle, and a few rather indistinct nearly parallel striæ on the surface of the basal portion; in others these striæ converge to form a small but very regular fan; and the scales appear to vary a good deal on different parts of the body.

The pectorals reach exactly to the base of the lateral caudal rays; the first two rays are simple, and all the others branched; first ray of all not half the length of the fin. Dorsal so situate as to leave a space between it and the end of the fleshy part of the tail about equal to its own length; the first ray simple, the others branched; the last prolonged beyond those which immediately precede it so as to form rather a point backwards. Anal similar to the



dorsal, and answering to it exactly. The ventrals are attached at a point, in this specimen, about half an inch posterior to the middle of the entire length, reckoning this to the end of the fleshy part of the tail; but are not much out of the middle, if the length be reckoned to the end of the upper lobe of the caudal: their length is contained not quite three and a half times in the entire length, excluding caudal; and they reach exactly to the end of the dorsal and anal: first ray very much branched, and only one-third the length of the fin; second ray appearing like two or even three rays at its upper extremity, from the circumstance of the several branches of it being of unequal length; all the other rays branched likewise. Vent a very little in advance of the anal. Upper lobe of the caudal one-third shorter than the lower; this last being exactly the same length as the ventrals.

D. 11; A. 12; C. 16, &c.; P. 18; V. 6.

Length 12 inches 8 lines.

COLOUR.—The colours were not noticed in the recent state; and the specimen is in such bad condition, and so much altered by the spirit, that they are now no longer distinguishable.

The flying-fish above described was taken by Mr. Darwin in the Pacific Ocean, off the coast of Peru, in Lat.  $18^{\circ}$  S. It appears to be the *E. exsiliens* of Bloch, but as I am not aware that the species of *Exocætus* have been ever rigorously worked out, and closely compared from different parts of the globe, I have thought it expedient to annex a description, by which it may be identified, if it prove hereafter distinct.\*

#### FAMILY.—SALMONIDÆ.

##### 1. TETRAGONOPTERUS ABRAMIS. *Jen.*

PLATE XXIII. fig. 1.

*T. corpore subrhomboideo, compressissimo, altitudine fere dimidium longitudinis, pinna caudali exclusâ, æquante: osse maxillari angusto, retrorsum arcuato: pinna dorsali triangulari, suprâ ventrales accuratè exorienti; anali lævi, longâ, altitudine retrò cito decrescente; utraq; plicis membranaceis, radiis longitudinaliter adhærentibus, instructâ: squamis in lineâ laterali 46, in lineâ inter pinnas ventrales et dorsalem transversâ 17.*

B. 4; D.  $1/10$ ; A.  $2/30$ ; C. 19, &c.; P. 13; V. 8.

LONG. unc. 4. lin. 7.

FORM.—Of a subrhomboidal form, the nape and back being much elevated, whence the profile falls very obliquely and in nearly a straight line. Greatest depth nearly half the entire length, excluding caudal. Body very much compressed, the thickness being nearly three and a half times in the depth. Head approaching to a laterally flattened cone, with the length and height nearly equal. Snout very short; mouth but little cleft; when open, the lower jaw projecting

\* Swainson is of opinion that "more than double the number of species of *Exocætus* really exist above those that have been described."—*Nat. Hist. of Fishes*, vol. i. p. 299.



considerably. Maxillary narrow, and of nearly equal breadth throughout, curving backwards. Teeth with their cutting edges dentated, the middle point much the most developed, with one or two smaller ones on each side: two rows of such teeth on the intermaxillary, and one in the lower jaw, this last row with scarcely more than eight or ten teeth in it. No teeth on the maxillary, vomer, palatines, or tongue. Eyes round, rather large, their diameter three and a half times in the length of the head, distant not so much as one diameter from the end of the snout. Nostrils with two orifices, the posterior one a narrow curved slit, the anterior one a round hole. The suborbital forms a somewhat triangular naked disk beneath the eyes, with radiating veins. Posterior margin of the opercle very little curved: subopercle narrow, and small, forming but a small portion of the gill-flap.

About seventeen scales in the depth, and forty-six in the lateral line, which last bends downwards rather below the middle, and is continued quite to the caudal. A scale taken from the middle of the side below the lateral line is somewhat rounded anteriorly, the basal margin being straight; the surface marked with very fine numerous concentric striæ, and with two coloured deeper striæ on the free portion diverging from the centre in a V-like form: some scales have three or four of these coloured striæ, drawn more or less regularly.

The dorsal commences in about the middle of the entire length, excluding the caudal and narrow part of the tail; of a triangular form, its greatest height equalling the depth to the lateral line. Pectorals narrow, shorter than the head, attached below the bottom of the gill-opening, and reaching rather beyond the insertion of the ventrals, which last are in a vertical line with the commencement of the dorsal and shorter than the pectorals. Anal long, commencing a very little beyond the tips of the reclined ventrals; the anterior portion rather more than half the height of the dorsal, but the posterior much lower, sloping rapidly off; two spines, the first very minute, the second about one-third the length of the first soft ray; the last soft ray double. The anal terminates nearly in a line with the adipose, which is small. Caudal forked for half its length: the lobes equal. Many of the rays in the vertical fins, more especially the dorsal and anal, are accompanied through nearly half their length from the bottom by membranous folds of skin. There are also some small scales along the base of the anal, but none apparent on the dorsal. In the axillæ of the ventrals is an elongated scale, not half their length.

COLOUR.—“Back bluish silvery, with a silver band on the side: a bluish black spot behind the gills. Fins pale orange; tail with a black central band.”—D.—There is now not much trace of the silver band, or the black band on the tail. The humeral spot is, however, still very distinct.

Habitat, the Rio Parana, South America.

This species was taken by Mr. Darwin in October in the Rio Parana, as high up as Rozario. I cannot ascertain that it is described, though there is much resemblance between it and the species figured in Seba.\* It differs from the *T. chalceus* of Spix, in its much smaller scales, not to mention other points of dissimilarity.

\* Thesaurus, vol. iii. pl. 34. f. 3.



2. TETRAGONOPTERUS RUTILUS. *Jen.*

PLATE XXIII. fig. 2.

*T. corpore ovali, compressissimo, altitudine tertiam partem longitudinis, hâc ad basin furcæ caudalis mensâ, æquante: osse maxillari angusto, retrorsum arcuato: pinnâ dorsali subtriangulari, paululum pone ventrales exorienti; anali lævi, longâ, altitudine retrò cito decrescente; utraq[ue] plicis membranaceis, radiis longitudinaliter adhærentibus, instructâ: squamis in lineâ laterali 40, in lineâ inter pinnae ventrales et dorsalem transversâ 14.*

D. 1/9; A. 2/27; C. 19, &amp;c.; P. 14; V. 8.

LONG. unc. 4. lin. 3.

FORM.—More oval than rhomboidal: the back and nape not so much elevated as in the last species; the profile falling less obliquely. Depth one-third of the entire length, measured to the base of the caudal fork: head one-fifth of the same. Not above fourteen scales in the depth, and forty in the lateral line, which occupies the eighth row from the top. The scales on the whole similar, but with the basal margin not so straight and regular, and somewhat projecting in the middle in the form of a blunt salient angle. The dorsal commences a trifle nearer the caudal, and at the middle of the entire length, the caudal alone excluded. The pectorals reach just to the insertion of the ventrals, which last are a trifle in advance of the dorsal. The second anal spine is longer, and nearly half the length of the soft rays which follow.

COLOUR.—“Back iridescent greenish brown: a silver band on the side. Fins dirty orange: tail with a central black band; above and below the band bright red and orange.”—D.—The colours appear very similar to those of the last species. The humeral spot, however, is less obvious, while, on the other hand, the silver band on the side can still be distinguished.

Habitat, Rio Parana, South America.

Taken with the last species, to which it is very closely allied. Mr. Darwin observes in his notes, that both are among the commonest of the river fry in the Rio Parana.

Both this and the *T. Abramis* are distinguished by having narrow longitudinal folds of skin attached to the basal half of the rays of the dorsal and anal fins, a character which does not shew itself in any of the three species next to be described.

3. TETRAGONOPTERUS SCABRIPINNIS. *Jen.*

PLATE XXIII. fig. 3.

*T. corpore ovali, subelongato, valde compresso; altitudine tertiam partem longitudinis, caudali exclusâ, æquante: osse maxillari paulo dilatato, recto: pinnâ dorsali suboblongâ, altâ, pone ventrales exorienti; anali scabrâ, altitudine retrò gradatim decrescente; radiis plicis membranaceis nullis: squamis in lineâ laterali circiter 38, in lineâ inter pinnae ventrales et dorsalem transversâ 12.*

D. 1/9; A. 3/22; C. 19, &amp;c.; P. 13; V. 8.

LONG. unc. 3. lin. 7.



**FORM.**—Still more oval and elongated than the last species, the profile falling in a gentle curve from the dorsal to the end of the snout. Depth exactly one-third of the length, excluding caudal: head one-fifth of the entire length, caudal included. Maxillary rather dilated towards the bottom, and quite straight, not curving backwards as in both the last species. Teeth rather larger, and more conspicuous. Nostrils larger. Only twelve scales in the depth, the lateral line occupying the seventh row from the top: thirty-seven or thirty-eight in the lateral line. Scales of a rather different form; the basal margin more sinuous, the free margin not so regularly curved, the coloured striae hardly obvious. Dorsal more oblong than triangular, higher in relation to the depth, of which it equals two-thirds, commencing at a point anterior to the middle of the length, excluding caudal. The pectorals reach a little beyond the ventrals, which are attached a little in advance of the dorsal. The anal has all the rays longer, and more nearly equal, the posterior part of the fin not being so much sloped off: there are three spines at the commencement, the first two minute, the third not quite half the length of the soft rays: this fin is furthermore distinguished from that of the two former species by the rays being set with asperities, which communicate a scabrous harsh feel to the touch, when the finger is passed along them from the base upwards.

**COLOUR.**—Not noticed in the recent state. In spirits it appears more silvery than either of the two last species: the back and upper part of the sides being brownish. A humeral dusky spot, and the remains of what was probably a bright silver band along the middle of the side from the gill to the caudal. At the base of the caudal is a dusky spot, which is prolonged in a line along the central rays to the commencement of the fork. The other fins faintly edged with dusky, but otherwise pale.

**Habitat,** Rio de Janeiro.

The more oval and elongated form, straight maxillary, and scabrous anal fin, at once distinguish this species from either of the two last. It was taken by Mr. Darwin in fresh water, at Rio de Janeiro, in June.

#### 4. TETRAGONOPTERUS TENIATUS. *Jen.*

*T. corpore ovali, valde compresso, altitudine tertiam partem longitudinis, hâc ad basin furcæ caudalis mensâ, æquante: osse maxillari margine posteriore recto: pinnâ dorsali suprâ ventrales accuratè exorienti; anali lævi, altitudine retrò cito decrescente; radiis plicis membranaceis nullis: squamis in lineâ laterali 40, in lineâ inter pinna ventrales et dorsalem transversâ 14.*

D. 1/10; A. 3/22, &c.

LONG. unc. 2. lin. 2.

**FORM.**—Depth and general form similar to those of the *T. rutilus*; also the same number of rows of scales, the lateral line occupying the eighth from the top. Anal smooth, and similar to that of the *T. rutilus* in form, but in the number of the spines and soft rays agreeing with the *T. scabripinnis*. The maxillary straight, but hardly so much dilated as in the last-named species, being of nearly equal breadth throughout. The teeth are more numerous than in either, amounting in the lower jaw to fourteen or more. The ventrals are in an exact line with the commencement of the dorsal.



COLOUR.—Much as in the *T. scabripinnis*. The same silver band, only more brilliant; also the same humeral spot, and the spot at the base of the caudal extending along the middle rays.

Habitat, Rio de Janeiro.

The above description is that of two small specimens, similar to each other, obtained by Mr. Darwin in a running brook at Socego, in the province of Rio de Janeiro. They are probably not full grown; but so evidently distinct from either of the last two species, the characters of which are in some measure combined in them, that I have not hesitated to give them a separate place. The silver band is more or less obvious in all the species of this genus brought home by Mr. Darwin, but it is much brighter in this than in any of the others.

5. *TETRAGONOPTERUS INTERRUPTUS*. *Jen.*

PLATE XXIII. fig. 4.

*T. corpore ovali, valde compresso: altitudine tertiam partem longitudinis totius æquante: ore parvo; osse maxillari brevissimo, dilatato, margine posteriore recto: dentibus minutis, multicuspidatis: dorsali subtriangulari, pone ventrales exorienti; anali (in uno sexu?) scabrâ, altitudine retrò subito decrescente; his pinnis plicis membranaceis nullis: squamis in lineâ longitudinali 35, in lineâ inter pinna ventrales et dorsalem transversâ 10: lineâ laterali interruptâ, haud finem pinnae pectoralis attingente.*

D. 1/10; A. 2/18; C. 18, &c; P. 11; V. 7

LONG. unc. 2. lin. 8.

FORM.—Oval, and not very dissimilar in general form to the *T. rutilus*, but rather more elevated above the shoulder. Depth exactly one-third of the entire length: head one-fourth of the same, caudal excluded. Profile not exactly straight, but very slightly hollowed out at the crown, then as slightly protuberant above the eyes, whence it falls more rapidly in front, giving the snout a short and blunt appearance. Mouth much smaller than in any of the preceding species, owing to the extreme shortness of the maxillary, which is broad, with the anterior margin curving outwards, but the posterior one straight. Teeth very small; the points on the cutting edges numerous (five or six on each tooth) and nearly equal; apparently only one row on the intermaxillary, and the same in the lower jaw; none on the maxillary. Eyes and nostrils as in the other species, but the anterior orifice of the latter larger. Subopercle much larger, forming a greater portion of the gill-flap. Scales relatively larger; only ten in the depth, and thirty-five in the length. They have no deep striæ on the basal portion, and consequently no fan; but they are very regularly marked with the usual finer striæ concentrically arranged, except on the free portion where they become indistinct.

The lateral line occupies the sixth row of scales from the top, but is very soon interrupted, coming to an end before it has reached the length of the pectoral, and not carried over more than eight or nine scales in the length. Dorsal subtriangular, commencing exactly at the middle of the length, caudal excluded. Anal shorter than in the other species, and not reaching so near the caudal; two spines, but the first extremely minute. Caudal forked for half its



length, the lobes equal. Ventrals more forward than in the other species, decidedly in advance of the dorsal, and attached at one-third of the entire length; their axillary scale very small. Pectorals narrow, reaching beyond them. No long folds of skin accompanying the rays of the vertical fins.

COLOUR.—Not noticed in the recent state, in which, judging from its appearance in spirit, it was probably silvery, or perhaps golden, with somewhat of an olivaceous hue becoming deeper on the back. There are evident remains of a bright longitudinal lateral band: also of a black spot at the base of the caudal. The dorsal and the anterior portion of the anal incline to dusky: the pectorals and ventrals are slightly dusky at their extremities; there is also a large irregular dusky stain on the back and shoulders anterior to the dorsal fin.

A second specimen differs from the above in being a trifle smaller, and not quite so deep in the body. The anal is also decidedly scabrous, as in the *T. scabripinnis*, and has one ray less in it. The colours are similar, excepting that the fins are rather less dusky, and the large dusky stain on the back and shoulders is wanting.

Habitat, Maldonado.

This species is one of several that were taken by Mr. Darwin at Maldonado, in the lake that had been suddenly drained, before alluded to. It is immediately distinguished from all the others in this genus above described, by its small mouth and abbreviated lateral line. The circumstance of the anal fin being scabrous in only one of the specimens leads to the suspicion that this may be a sexual character, perhaps common to this and several species; and, judging from its somewhat less depth, I conceive the specimen so distinguished in this instance to be a male.

#### HYDROCYON HEPSETUS. *Cuv.*

*Hydrocyon hepsetus*, *Cuv.* Reg. An. (ed. 2) tom. ii. p. 312.

——— *falcatus*, *Freycinet*, (Voyage) Zoologie, p. 221, pl. 48. fig. 2.

FORM.—Back rising slightly from the nape, whence the profile in front falls obliquely in nearly a straight line to the mouth. Depth contained about three and a half times in the length, caudal excluded. Both head and body much compressed, the greatest thickness being only two-fifths of the depth. The length of the head equals the depth of the body. Snout appears rather pointed when the jaws are shut; when open, the lower jaw is a little the longest. Gape considerable. Maxillary long, commencing before the eyes, and reaching to a vertical from the posterior part of the orbit; inclining downwards, lapping obliquely in part over the lower jaw, gradually widening towards the posterior extremity, which is rather obliquely rounded. Intermaxillary with two sharp canines in front, then on each side four or five very small hooked teeth, then another large canine, though not so large as those in front; behind this commences the maxillary, which is armed all along its margin with a regular row of small equal hooked teeth, resembling sharp serratures; a similar row on each palatine, but none on the vomer or tongue; this last pointed, and free at the tip. Lower jaw with two strong canines in front, larger than those in the upper, and fitting into two holes above, when the mouth is shut; on each side of these are three only half their size, but increasing backwards, placed at rather wide



intervals; then follow a row of close, minute, sharp teeth, similar to those on the edge of the maxillary. Eyes rather large, their diameter not quite one-fourth the length of the head, distant one diameter and a quarter from the end of the snout. Suborbital large, consisting of three pieces. Preopercle rectangular. A row of pores, not very distinct, along the under part of the lower jaw, thence continued along the limb of the preopercle. Opercle and subopercle taken together with the posterior margin forming a slight but regular curve, with scarcely any salient angle.

Head naked; scales on the body of moderate size, arranged in somewhat oblique rows, especially below the lateral line; one from the middle of the side below the lateral line of an irregularly rounded form, the posterior margin rather sinuous, the disk with numerous fine concentric striæ, but no deeper-cut striæ on the basal portion. About sixteen scales in a vertical row, and fifty-seven or fifty-eight in the lateral line: this last bending downwards in a curve which falls below the middle of the depth. Scales on the lateral line not larger than the others.

The dorsal answers to the space between the ventrals and anal; its height equals the depth to the lateral line. Anal long, commencing exactly under the last ray of the dorsal; the first part of this fin as high as the dorsal, but the rays, beyond the fifth, gradually decreasing; three spines, the first two very minute; the last soft ray double. Caudal in this specimen injured. Adipose and last ray of the anal in the same vertical line. Pectorals two-thirds the length of the head, attached very low down beneath the terminating portion of the gill-flap, narrow and slightly falcate, reaching to the ventrals, which last are one-fourth shorter. A long narrow scale in the axilla of each ventral one-third the length of the fin itself.

B. 4; D. 11; A. 3/26; C. 22, &c.; P. 12; V. 8.

Length 4 inches 3 lines.

COLOUR.—“Bluish silvery.”—D.—Some appearance of a dusky spot at the base of the caudal prolonged in a line along the middle rays, but scarcely any trace of a humeral one. The dorsal and anal incline a little to dusky.

Taken at Maldonado, in a fresh-water lake, in June. I have scarcely any doubt of its being the *H. falcatus* of the Zoology of Freycinet's voyage, the figure of which it exactly resembles, excepting that the humeral dark spot, if it ever existed, and which is not mentioned in Mr. Darwin's notes, is now almost entirely effaced. It is probable, however, that there are two or three species nearly allied, for which reason I have been the more particular in my description. The *H. Hepsetus* of D'Orbigny\* appears to differ from the *H. falcatus* of Freycinet (with which last Cuvier associates his name of *Hepsetus*,) in having the lateral line curving upwards rather than downwards, and the caudal fascia as well as the humeral spot more marked. The *Salmo falcatus* of Bloch is probably distinct from both.

\* *Voy. dans L'Amer. Mérid. Atl. Ichth. pl. 9. fig. 2.*



GENUS.—APLOCHITON. *Jen.*

*Corpus elongatum, compressum, subfusiforme, undique nudum alepidotum. Caput parvum. Rostrum breviusculum, subacutum. Os terminale, rictu modico. Maxilla superior margine ex ossibus intermaxillaribus omnino formato, maxillaribus, hæc subæquantibus, retroductis. Dentes minuti, acuti, in maxillâ utraq̃ue uniseriati, in linguâ et vomere longitudinaliter biseriati, in ossibus palatinis nulli. Apertura branchialis amplissima, membranâ triradiatâ, subtus profundè emarginatâ. Pinne, dorsalis paululum pone ventrales, analis paululum pone dorsalem reclinatam, exorientes. Ventrales appendicibus axillaribus nullis. Pinna caudalis bifurca.*

I have already noticed a remarkable new form among the *Cyprinidæ* brought home by Mr. Darwin, and differing from all the known genera in that family by the entire absence of scales. The one now to be described is not less remarkable among the *Salmonidæ*, and, what is particularly interesting, would seem to occupy an exactly analogous place in this family, departing from it in the same important character of having the skin perfectly naked and free from scales. There are, however, many other points of similarity between *Mesites* and the genus which I have here termed *Aplochiton*.\* In both there is the same form of mouth, the margin of the upper jaw being entirely formed by the intermaxillary, behind which is the maxillary of nearly equal development. The teeth in the jaws are similar, both in regard to form and arrangement; there is also the same double longitudinal row on the tongue, and along the vomer. The pieces of the opercle are similar, and the gill opening equally large in both genera, though the branchial membrane has twice the number of rays in *Mesites* that it has in *Aplochiton*. Furthermore, the fins are on the whole very similar, with the exception of the dorsal not being so far back in *Aplochiton*, and there being also an adipose in this genus. It is also deserving of notice that both these new forms, so resembling each other in many of their characters, come from the same quarter of the globe, being found either in the most southern parts of S. America, or in the neighbouring islands.

From the circumstance of the naked skin, *Aplochiton* might by some be referred to the *Siluridæ*, but what was said of the genus *Mesites* may be repeated here, that it has none of the other external characters of that family. The maxillary, instead of being reduced to a mere vestige, or lengthened into a barbule, is as much developed as in any of the *Cyprinidæ*, and of the usual form; the subopercle also is very distinct;† while there is no strong spine at the commencement of either the dorsal or pectoral fins. At the same time it must be mentioned that *Aplochiton*

\* Ab απλως simplex, et χιτων tunica.

† Valenciennes says, in his preface to the fifteenth volume of the "Histoire des Poissons," that none of the *Siluridæ* have the subopercle; and that the absence of this bone serves to distinguish them from *Cobitis*.



agrees with the *Siluridæ* in having no cæcal appendages, though the air-bladder is similar to that of the ordinary *Salmonidæ*. There are some peculiarities connected with the anal and sexual orifices which I shall notice presently, along with other points in the internal structure, in the species to be described first.

Mr. Darwin has brought home two species of this new genus, agreeing precisely in form, but very distinct in respect to size and colouring.

# 1. APLOCHITON ZEBRA. *Jen.*

PLATE XXIV. FIG. 1.

*A. obscure plumbeus; fasciis nigris transversis: maxillis æqualibus.*

B. 3; D. 11; A. 2/14; C. 16, &c.; P. 18; V. 7.

LONG. unc. 9. lin. 6.

FORM.—General form somewhat resembling that of the *Mackarel*, elongated, and approaching to fusiform. Greatest depth about the middle, equalling one-sixth of the entire length. Line of the back and profile nearly straight, the latter falling very little. Greatest thickness rather more than half the depth. Head small, contained about five and a half times in the entire length. Snout short, but rather acute. Mouth with a moderate gape reaching to beneath the anterior angle of the eye: when shut, both jaws equal, the lower one ascending at an angle of  $45^{\circ}$  to meet the upper; when open, the lower one a little the longest. Margin of the upper jaw formed by the intermaxillary, the maxillary appearing behind it. A single row of small but sharp teeth extending along the entire margins of both jaws: a double row of similar teeth, but stronger and more curved, down the middle of the tongue; also a double row along the middle of the vomer. Eyes moderate; their diameter four and a half times in the length of the head; distant about one diameter and a quarter from the end of the snout, and with an interval between them of about one and a half. Nostrils with two orifices, both roundish, one before the other, with a little interval between, the posterior one rather the largest. Two distinct pores on each side of the crown, one behind the other with an interval between, above and rather behind the eyes. Gill-opening very large, the membrane with only three flattened rays, deeply notched beneath, the notch reaching to beneath the middle of the eyes. All the pieces of the opercle present, but the interopercle only just appearing behind the angle of the preopercle, and the subopercle forming but a narrow lanceolate lamina beneath the true opercle, which last constitutes the greater portion of the gill-flap, and is of an oblong form, the posterior margin being cut straight and vertical.

The whole skin perfectly naked everywhere, without the least vestige of scales. No lateral line, except a faint streak, passing along the middle of the sides, be so called. Dorsal commencing at the middle of the length, this last being measured to the base of the caudal fork; of the same form as in the ordinary species of the genus *Salmo*; its greatest height a little exceeding its length, which last is rather more than half the depth of the body; first ray simple, the rest branched. Adipose small, and just half way between the end of the dorsal and the base of the caudal. Anal of a somewhat triangular form, the margin sloping very much off backwards, commencing a little beyond the tip of the reclined dorsal, and terminating opposite



the adipose, or perhaps a trifle beyond it; two small spines at its commencement; the first two soft rays simple, the others branched. Caudal forked for half its length, the lobes equal; the whole fin contained about six and a half times in the entire length; the accessory rays very numerous, and partially fringing the upper and lower edges of the tail. Pectorals attached behind the gill-opening, rather below the middle, about two-thirds the length of the head, of a somewhat triangular form, the rays gradually shortening from the first, which is the only one unbranched. Ventrals attached a very little in advance of the dorsal, rounded, or almost cut square at the ends, the rays being all nearly equal. They are scarcely shorter than the pectorals: the space between their insertion and the commencement of the anal is nearly double their own length. There is no long scale or appendage of any kind in their axillæ.

COLOUR.—“Dull leaden colour.”—D.—In spirits it appears brown. The sides are banded with some irregular transverse zebra-like marks, not noticed by Mr. Darwin, reaching from the back down two-thirds or three-fourths of the depth, some terminating sooner than others. All the fins brownish.

Habitat, Falkland Islands.

Mr. Darwin obtained three specimens of this remarkable fish all precisely similar, from a fresh-water lake in the Falkland Islands, in March. The lake was not far from the sea, and connected with it by a brook. He adds in his notes that the species is common there; that it is good eating, and grows to be about half as large again as the individuals procured.

One of these specimens was dissected by Mr. Yarrell and myself, and presented the following internal characters, which are of importance to be noted. The coats of the stomach were thick and muscular; the œsophageal portion with prominent longitudinal plicæ. Its contents, so far as they could be ascertained, consisted of the remains of caddis-worms. The intestine was large, without any cœcal appendages, but with one spiral convolution at the end of the first third of its length from the pyloric orifice: the entire length of the canal was four inches. The air-bladder was large, undivided, and of the same general form as in many of the *Salmonidæ*. There were two elongated flattened lobes of roe nearly ready for exclusion. The anal and sexual orifices were separated, but enclosed in a tubular sheath, common to both, directed backwards; the sheath itself lying in a groove in the abdomen, and five-eighths of an inch in length: the opening to the cavity of the abdomen and sexual organs was at the extreme end of this sheath, and partly closed by two lateral valves; the opening to the intestine, three-eighths of an inch short of the extremity.

## 2. APLOCHITON TENIATUS. *Jen.*

PLATE XXIV. FIG. 2.

*A. olivaceus, punctis fuscis minutissimis irroratus; lateribus vittâ longitudinali argenteâ: maxillâ inferiore longiore.*



B. 3; D. 12; A. 2/13; C. 16, &c.; P. 18; V. 7.

LONG. unc. 3. lin. 10.

FORM.—A much smaller species than the last, but the general form similar. Rather more elongated, the depth being contained seven and a half times in the length. Head one-fifth of the length measured to the base of the caudal fork. Snout a little longer, and more pointed. Lower jaw at all times a little the longest. Teeth similar, and similarly disposed. Nostrils similar; but no pores on the crown, or only one on each side, and that not very distinct. All the fins similar.

COLOUR.—Not noticed in the recent state. In spirits it appears of a uniform greenish or olivaceous brown, the back and sides very minutely dotted with darker brown. There is a pale silver band along the middle of the side, not bounded, however, by any definable line, but shading off insensibly into the brown above and below. The irides are still bright, and appear to have been golden.

Habitat, Goree Sound, Tierra del Fuego.

There are three specimens of this second species in the collection, all of the same size, and not differing in any respect from each other, except that one of them has thirteen rays in the dorsal fin, and fourteen soft rays in the anal. Mr. Darwin's notes state that they were taken at Goree Sound, Tierra del Fuego, in the mouth of a fresh-water stream, where the water was quite fresh; and that when put into salt water they immediately died.

The silver band at once distinguishes this elegant species from the last, independently of its smaller size. The specimens appear full grown.

There is the same peculiarity with respect to the anal and sexual orifices in this species, as in the one previously described.

#### FAMILY.—CLUPEIDÆ.

##### 1. *CLUPEA FUEGENSIS*. *Jen.*

Mr. Darwin's collection contains a single individual of a species of *Clupea* from Tierra del Fuego so extremely similar to the young of the common Herring, that it might almost be mistaken for it. As it is small, and in not very good preservation, I shall merely point out some of its leading characters.

Depth of the body the same as in a young *Herring* of the same size. Belly carinated, but with the serratures not more developed than in that species. Teeth the same, and very minute. The maxillary does not slope inwards quite so much at its upper extremity, before uniting with the intermaxillary; but the mouth and its several parts are in all other respects similar. The same may be said of the pieces of the opercle, excepting that there is a more sensible notch near the upper part of the posterior margin of the gill-flap, much as in the common *Sprat*. It



differs also from the Herring in having the ventrals exactly in a line with the commencement of the dorsal, this last being placed a little further back than in that species.

D. 18; A. 19; C. 19, &c.; P. 18; V. 8.

Length 3 inches.

"Caught at night, off Cape Ines, Tierra del Fuego, two miles from the shore, in thirteen fathoms."—D.—The specimen is probably not full-sized,

## 2. *CLUPEA ARCUATA.* *Jen.*

The present species is from Bahia Blanca. The specimens, of which there are two, are also in bad condition like the last, and probably not full-sized.

FORM.—Body deep, with the ventral line swelling rather more outwards than the dorsal. Greatest depth a little exceeding one-fourth of the entire length. Very much compressed: abdomen carinated, and very sharply serrated, the serratures sharper than in the common sprat. A few minute teeth at the extremity of the lower jaw, and also on each side of the intermaxillary, near its junction with the maxillary; the lower half of this last finely serrated. Pieces of the gill-cover much as in the Sprat; the subopercle rounded at bottom, the opercle with a shallow notch near the upper angle.

The dorsal commences exactly in the middle of the entire length, excluding caudal. The ventrals are as nearly as possible directly beneath its first ray: these fins are very small, and shorter than in the sprat.

D. 18; A. 23; C. 19, &c.; P. 16; V. 7.

Length 4 inches 2 lines.

COLOURS.—"Back blue; belly silvery."—D.

The second specimen is similar, only smaller. Both were taken in the month of September.

## 3. *CLUPEA SAGAX.* *Jen.*

A third species of *Clupea*, in Mr. Darwin's collection, likewise in bad condition, much resembles in general form the common Pilchard.

Depth the same as in the Pilchard, but the head larger and longer than in that species, being one-fourth\* of the entire length. Abdomen smoother; no appearance of any serratures in front of the ventrals. Lower jaw but little advanced beyond the upper. No perceptible teeth, more than a few very minute serratures near the lower extremity of the maxillary. Diameter of the eye about one-fifth the length of the head. The form and veinings of the pieces of the opercle very much as in the Pilchard, but the interopercle more developed. The posterior margin of the opercle and subopercle taken together is almost quite straight, without any emargination anywhere, and not far out of a vertical; the subopercle is cut nearly square at bottom. The preopercle is much veined: there are also some veins on the upper part of

\* In the pilchard it is one-fifth.



the opercle, and lower down on this last piece some very deep striæ, running parallel to its junction with the preopercle, as in the Pilchard, but still more strongly marked.

The commencement of the dorsal is very little anterior to a middle point between the end of the snout and the base of the middle caudal rays. The ventrals are beneath the posterior half of the dorsal as in the Pilchard. There are the same two elongated scales on each side of the caudal as in that species. The scales on the body, however, are much smaller than in the Pilchard, with their free portions striated, the basal portions marked with some irregular curved lines running in a transverse direction towards the median line of the scale.

D. 11 ; A. 18 or 19 ; C. 19, &c. ; P. 18 ; V. 8.

Length 10 inches 6 lines.

Habitat, Lima, San Lorenzo Island.

*ALOSA PECTINATA. Jen.*

PLATE. XXV.

*A. corpore ovali, altitudine prope tertiam partem longitudinis æquante : ventre carinato, serraturis, præsertim inter pinna ventrales et analem, acutis : maxillis subæqualibus, edentulis : preoperculo venoso ; operculo striato : squamis pectinatis : pinnis ventralibus paulo ante dorsalem exorientibus.*

D. 16 ; A. 21 ; C. 19, &c. ; P. 17 ; V. 7.

LONG. unc. 12.

FORM.—Of an oval compressed form, the depth very considerable, equalling very nearly one-third of the entire length. Head contained about three times and three quarters in the same. Abdomen sharply carinated, with strong serratures, especially between the ventrals and anal. Jaws nearly equal, perhaps the lower one a little the longest ; intermaxillary deeply notched ; no apparent teeth anywhere. Eyes rather high, partly covered both anteriorly and posteriorly by a membranaceous veil ; their diameter about one-fifth the length of the head ; more than one diameter between them and the end of the snout. Subopercle obliquely rounded off at bottom, but the curvature of the posterior margin of the opercle and subopercle taken together not very considerable. Preopercle marked with vein-like ramifications ; opercle similarly veined, and also striated below, as in the species last described, though more finely. Scarce any trace of a lateral line.

Scales moderately large, thin and membranaceous. One from the middle of the side of a sub-oblong form, the hinder angles rounded, its length only two-thirds of its breadth ; the greater portion of the surface marked with exceedingly delicate striæ, scarcely visible without a strong lens, the anterior margin pectinated, and with a slightly projecting lobe in the middle. The scales as they approach the tail, become longer in proportion to their breadth, the basal margin more rounded, and sometimes with a strongly projecting lobe in the middle. The pectinations are longest on the scales covering the nape.

The dorsal commences a little behind the middle point of the oval of the body, and the ventrals are attached a little in advance of that fin. The anal commences a little behind the termination of the dorsal, and reaches to the commencement of the fleshy part of the tail : the last ray in both dorsal and anal is slightly lengthened beyond the preceding ones. The pec-



torals reach to the ventrals, and are contained about once and two-thirds in the length of the head. Caudal deeply forked; the lower lobe a little longer than the upper one: the base appears to have been covered with minute scales. Above the pectorals is a thin membranaceous lanceolate scale, more than half the length of the fin: a somewhat similar scale in the axillæ of the ventrals, but shorter in proportion; another below those fins.

COLOUR.—“Body silvery: dorsal scales iridescent with green and copper: head greenish: tail yellow.”—D.

A second specimen agrees with the above in form, but is smaller, measuring only  $7\frac{1}{2}$  inches. The colours, when recent, according to Mr. Darwin's notes, were as follows:—“Scales silvery iridescent; back especially greenish; caudal fin yellow: remarkable for a circular dark green patch behind the gill-cover.”—D.

Habitat, Bahia Blanca.

This species was caught by Mr. Darwin in the net, on a sandbank, at Bahia Blanca. It is well characterized by its strongly-pectinated scales, and does not appear to have been noticed by authors; though it would seem in that respect to have some affinity with the *Clupea fimbriata* of Bowdich.\*

#### ENGRAULIS RINGENS. Jen.

*E. capite compresso, grandiusculo, quartam partem longitudinis totius æquante: rostro acuto, ultra maxillam superiorem mediocriter prominulo; mandibulâ angustâ, dentibus lateralibus (ut etiam in maxillâ) minimis: corpore compresso: pinnis ventralibus infra, vix ante, initium pinnæ dorsalis exorientibus: squamâ longissimâ membranaccâ super pinnam pectoralem retrorsum productâ.*

D. 15; A. 19; C. 19, &c.; P. 16; V. 7.

LONG. unc. 5.

FORM—Closely resembling the common Anchovy, but the head decidedly larger and longer, being one-fourth of the entire length.† Eye larger, but bearing an equal proportion to the size of the head; also rather nearer to the tip of the snout in consequence of this last not being so acute and much produced. Lower jaw rather narrower, from the greater compression of the head and body. Maxillary, and its fine serratures on the edges for teeth, similar.

The depth of the body is about one-sixth of the entire length. The dorsal commences at the middle point of the length, reckoning this last to the base of the caudal fork, and terminates a little before the commencement of the anal: the first ray is not half the length of the second and third, which equal three-fourths of the depth: the fifth and succeeding rays become gradually shorter than those which precede. The first ray in the anal is likewise very short, and scarcely one-third of the next following. The ventrals arise almost directly under the first ray of the dorsal, being scarcely at all in advance; when laid back, they do not reach half-way to the anal. Above the pectoral is a long membranaceous scale equalling, or very nearly, the fin itself.

\* *Excursions in Madeira*, p. 234, fig. 44.

† In the *E. enchrasicholus*, it is hardly one-fourth of the length, excluding caudal.



COLOUR.—Not noticed in the recent state. In spirits, it appears silvery, with the back and upper part of the sides deep dusky blue, the two colours separated by a well-defined line.

Habitat, Iquique, Peru.

This is probably an undescribed species of *Engraulis*; nor am I aware that authors have hitherto noticed any from the west coast of America. Mr. Darwin obtained two specimens which are precisely similar to each other. The species closely resembles the common European Anchovy,\* differing principally in its larger head, and more backward ventrals in respect to the dorsal.

#### FAMILY.—PLEURONECTIDÆ.

Mr. Darwin's collection contains individuals of five species belonging to this family, besides the drawing of a sixth; but the specimens brought home are dry, and badly preserved. Two appear to have been previously noticed; but it is difficult to pronounce upon the other three with certainty, neither do they admit of being very accurately described. These last, therefore, I shall not venture to name, but merely point out a few of their principal characters, adding the localities whence they were obtained.

The species, of which there is a drawing, I conceive to be certainly new; and as its characters are very distinguishable, I shall name it in honour of the gentleman, one of the officers of the Beagle, by whom the drawing was made.

##### 1. PLATESSA ORBIGNYANA. Val.?

*Platessa Orbignyana*, Val. in D'Orb. Voy. dans l'Amer. Mérid. Atl. Ichth. Pl. 16. fig. 1.

FORM.—Oval; greatest breadth two and a half times in the length. Eyes on the left side, near together, and equally in advance. Teeth in a single row, sharp-pointed, moderately strong, rather widely separate: posterior extremity of the maxillary cut nearly square. Dorsal commencing in a line with the eyes, and leaving a space between it and the caudal. The lateral line takes a sweep over the pectoral. Upper or eye side of the body slightly rough, with the scales finely ciliated; under side smooth, the scales on this side not ciliated.

COLOUR.—“Above dirty reddish brown; beneath faint blue: iris yellow.”—D.

Length 8 inches 9 lines.

Habitat, Bahia Blanca, where it is said to be plentiful.

This species agrees so well with the figure of the *P. Orbignyana* in D'Orbigny's Voyage, that I have little hesitation in considering it the same,—but as

\* I am indebted to Mr. Yarrell for the loan of a specimen of our common Anchovy for comparison.



no description of this last has been yet published, it is still possible I may be mistaken.

## 2. PLATESSA——?

FORM.—Very similar to the last species, from which it scarcely seems to differ, except in having the teeth smaller, and somewhat more numerous and closer together; also in the maxillary, which is more dilated at its posterior extremity, and more obliquely truncated. The scales are extremely similar.

Length 6 inches 6 lines.

COLOUR.—Not noticed.

Habitat, King George's Sound, New Holland.

## HIPPOGLOSSUS KINGII. Jen.

### PLATE XXVI.

*H. fuscus: corpore ovato, lato: oculis sinistris, haud valde approximatis: dentibus acutis, fortioribus: lineâ laterali anticè arcuatâ: pinnâ dorsali supra oculos initium capienti, dimidio anteriore humillimo, posteriore modicè elevato: ventralibus distinctis, haud anali continuis: caudali subquadratâ, radiis mediis cæteris paululum longioribus.*

D. 18 et 48; A. 51; C. 14; P. 11; V. 6.

FORM.—Breadth, not including the dorsal and anal fins, half the length of the oval of the body. Eyes on the left side, apparently distant from each other about two diameters; the upper one a little behind the lower. Teeth sharp and strong, forming a very regular series. The lateral line takes a sweep over the pectoral fin. The dorsal commences above the upper eye; the first half, or until it gets above the extremity of the reclined pectoral, is very little elevated, and much lower than the rest of the fin, with the membrane apparently notched between the rays; the remainder of the fin attains a moderate elevation, and there is an abrupt transition from the former to the latter portion. The anal answers to the elevated portion of the dorsal: both these fins fall short of the caudal by a small space. Pectorals short, and of a somewhat triangular form. Ventrals very distinct, free, placed right and left, with the rays a little projecting beyond the membrane; which last character appears also in the dorsal and anal. Tail somewhat square, but the middle rays slightly projecting beyond the lateral ones in the form of an obtuse lobe.

COLOUR.—Represented in the drawing of a uniform light brown.

Habitat, Valparaiso.

This is the species of which, as before stated, no specimen was brought home, but only a coloured drawing made by Mr. Phillip King, an officer of the Beagle, for Capt. FitzRoy. The drawing appears to have been done with accuracy, and from it the above description has been taken. The fin-ray formula, however, was computed from the recent fish, the above numbers being marked upon the drawing.

The teeth appear to indicate this species as belonging to *Hippoglossus* rather



than to *Rhombus*, though possibly it may be found hereafter to serve as the type of a distinct subgenus in this family. The form of the dorsal fin, if correctly delineated, is remarkable. The size of the fish is not stated.

#### RHOMBUS———?

FORM.—Oval, approaching to rhomboidal. Breadth a little exceeding half the length. Eyes on the right side, near together, equally in advance, or the lower one perhaps rather more forward than the upper; between them a double osseous ridge. On the under side of the head, and nearly answering in position to the upper eye, is a deepish cavity, from whence proceeds a tentaculiform appendage four or five lines in length. Teeth very small, sharp, in scarcely more than two rows, and apparently confined to the under side. Lateral line sweeping over the pectoral. Dorsal commencing above the upper lip, and reaching nearly to the caudal, but leaving a minute space. Both sides of the body are smooth, but the upper one appears to have lost its scales. Pectoral on the eye side about three-fourths the length of the head.

Length 5 inches.

COLOUR.—“Above pale purplish brown, with rounded darker markings.”—D.

Habitat, Bahia Blanca, Coast of Patagonia.

#### ACHIRUS LINEATUS. *D'Orbig.*

*Achirus lineatus*, *D'Orb.* Voy. dans L'Amer. Mérid. Atl. Ichth. Pl. 16. fig. 2.

FORM.—Body oval, but with the dorsal and anal fins included, approaching orbicular; the greatest breadth rather more than half the length. Eyes on the right side, moderately near together, the upper one a very little in advance. Lower jaw longest, projecting beyond the snout. Teeth forming a velutine band, very minute, and scarcely sensible except to the touch, confined to the side opposed to the eyes. Preopercle distinct from the opercle. A few short thread-like cirri on the under side of the head; two at the extremity of the snout being rather longer and more conspicuous than the others. Lateral line nearly straight throughout its course, somewhat higher at its commencement than afterwards, but taking no sweep. Both sides of the body rough, with ciliated scales, but the upper one most so. The dorsal commences above the upper lip, and reaches, as also the anal, almost quite to the caudal: this last rounded. Pectorals entirely wanting.

Length 9 inches.

COLOUR.—Not noticed.

Habitat, Rio Plata.

This species was obtained by Mr. Darwin in the market at Buenos Ayres, where it is said to be eaten. It so exactly accords in form with the figure of the *A. lineatus* in D'Orbigny's Voyage, that I have little hesitation in considering it the same, though, from the specimen being dried, there are no vestiges left of the transverse lines. Whether it be the *A. lineatus* of any other author I am uncer-



tain. It approaches, however, very closely the *Passer lineis transversis notatus* of Sloane.\*

PLAGUSIA——?

FORM.—Oval, but narrow, and much elongated for a *Sole*, the breadth in the middle being three and a half times in the length. Eyes on the left side, very small, and closely approximating, equally in advance, or if any difference, the lower one a little first. Mouth small, with velutine teeth on the supine side, but apparently none on the upper: snout a little produced in a point beyond it. The dorsal and anal unite with the caudal, which terminates in rather a fine point. No trace of any pectorals above or below. Scales strongly ciliated, especially above, and both sides of the body rough.

Length 7 inches.

COLOUR.—Not noticed.

Habitat, San Blas, Coast of Patagonia.

This species is very nearly allied to the *Plagusia Braziliensis* of Spix's work,† but it appears to differ in having the eyes one over the other, or the lower one perhaps a little in advance, instead of the upper one a little before the lower.

FAMILY.—CYCLOPTERIDÆ.

1. GOBIESOX MARMORATUS. *Jen.*

PLATE XXVII. Fig. 1.

*G. dorso et lateribus pallidè fuscis, nigro reticulatis et fasciatis: dentibus anterioribus majoribus, in maxillâ superiore subconicis, in inferiore incisivis: operculo posticè mucrone obtuso armato: membranâ branchiali spinâ gracili, subduplici, (præter radios solitos,) instructâ, magnâ ex parte celatâ, apice exserto: pinnâ dorsali tredecim-radiatâ.*

B. 6; D. 13; A. 11; C. 14 vel 15; P. 20 vel 21.

LONG. unc. 2. lin. 7.

FORM.—Head very large, broad and much depressed, with the snout rounded nearly in an exact semicircle. Body compressed behind, and suddenly tapering behind the pectorals. The length and breadth of the head are equal, each being one-third of the entire length, excluding caudal. Gape wide, reaching nearly to beneath the anterior angle of the eye. Teeth strong, and somewhat crowded in front; in the upper jaw bluntly conical, or slightly curved, but of irregular size, with minuter ones behind; very small at the sides of the jaw, and apparently here but in a single row: below, the six middle teeth are incisor-like, and project forwards; on each side of these are two or three similar to those in front above, then follow some minuter ones at the sides. Eyes rather more than a diameter apart. Gill-open-

\* *Nat. Hist. of Jamaica*, Pl. 246, fig. 2.

† *Pisces Brazil.* p. 89, tab. L.



ing wide, the membrane free all round, with six rays. Opercle terminating behind in a blunt point: there is also a kind of double spine concealed in the thickness of the branchial membrane, in front of the ordinary branchial rays, the extreme end of one portion of which projects a little beyond the margin.

The dorsal commences a little beyond the middle of the entire length, and leaves a space between it and the caudal; the rays nearly equal, except the first, which is short. The anal begins under the fourth or fifth dorsal ray, and extends a trifle further than that fin. Caudal slightly rounded.

COLOUR—(*In spirits.*) Back and sides light brown, reticulated with black: the reticulations have a tendency to form three or four broad fasciæ across the back. Under parts yellowish.

Habitat, Archipelago of Chiloe.

This and the following species appear to belong to the genus *Gobiesox* of Cuvier's "Regne Animal," and are probably new. Two specimens of the one above described were found by Mr. Darwin under stones off the island of Lemuy, in the Archipelago of Chiloe.

## 2. *GOBIESOX PÆCILOPHTHALMOS.* *Jen.*

PLATE XXVII. Fig. 2.

*G. fuscescenti-albidus, immaculatus: dentibus anterioribus majoribus, supra et subtus incisivis: operculo posticè spinâ acutâ armato; membranâ operculari margine, supra spinam, cirris paucis filamentosis fimbriato; membranâ branchiali spinâ nullâ: pinnis dorsali et anali septem-radiatis.*

B. 6; D. 7; A. 7; C. 12; P. 23;

LONG. unc. 1. lin. 10.

FORM.—General form the same as that of the last species, including the proportion of head to body. Snout equally rounded. Teeth on the whole similar, but the upper ones in front, as well as the lower, incisor-like. Eyes rather larger, closer together, less than a diameter apart. Differs essentially from the *G. marmoratus* in the form of the opercular spine, which is much sharper, as well as somewhat longer and slenderer; also in having no spine concealed in the branchial membrane: the lower part of the opercular membrane, just above the spine, is fringed with a few thread-like filaments. The number of branchial rays is the same.

The dorsal and anal are both shorter, and appear to have only seven rays each: the anal reaches a little nearer the caudal. The pectorals on the contrary have rather more rays.

COLOUR—(*In spirits.*) Every where of a uniform very pale brown, or brownish white, without any markings whatever. The eyes were probably very brilliant in the living fish, the irides still showing traces of what seems to have been blue and golden pink.

Habitat, Galapagos Archipelago.

A single individual of this species was obtained by Mr. Darwin in tidal pools at Chatham Island, in the Galapagos Archipelago.



## FAMILY.—ECHENEIDIDÆ.

ECHENEIS REMORA. *Linn.*

Mr. Darwin took a small specimen of this fish from off a shark in the Atlantic Ocean, near St. Paul's Rocks. It is not four inches long. It has eighteen pairs of laminae on the head; and a rough disk on the middle of the tongue:\* caudal lunate.

## FAMILY.—ANGUILLIDÆ.

ANGUILLA AUSTRALIS. *Richards.*

*Anguilla australis*, *Richardson*, *Proceed. of Zool. Soc.* 1841, p. 22.

FORM.—Very similar to the *A. latirostris*, Yarr., but the upper jaw rather shorter and broader, making the gape, which reaches to a vertical line from the posterior part of the orbit, wider. Teeth rather stronger. Dorsal commencing considerably beyond the first third, and not much in advance of the middle point, of the entire length; much less elevated than in the *A. latirostris*, its height scarcely exceeding one-fifth of the depth, which last is about one-seventeenth of the entire length. Vent a little posterior to the commencement of the dorsal.

The distance from the end of the snout to the insertion of the pectorals is rather less than one-eighth of the entire length: the form of the pectorals is lanceolate. The tail is rounded, much as in the *A. latirostris*.

	in.	lin.
Length (entire) . . . . .	17	3
From end of snout to commencement of dorsal . . . . .	7	6
From the same to insertion of pectoral . . . . .	2	2
From the same to vent . . . . .	7	9

COLOUR—(*In spirits.*) Appears similar to that of the common eel.

Habitat, New Zealand.

The above eel was procured by Mr. Darwin in fresh water in the month of December, in the Bay of Islands, New Zealand. It so nearly accords with the *A. australis* of Dr. Richardson from Van Dieman's Land, that I can hardly suppose it to be a distinct species. The vent, however, would seem to be a trifle backward, and the body deeper in proportion to its length. Without seeing more specimens, it is impossible to say what importance is to be attached to these points of discrepancy.

\* I notice this circumstance, because Mr. Lowe, in the "Proceedings of the Zoological Society," (1839, p. 89.) has briefly described two species of this fish, which he calls *E. Remora* and *E. pallida* respectively, the former having the tongue *smooth*, and the latter *rough* in the middle, besides other differences.

The above specimen obtained by Mr. Darwin, as well as two others in the Museum of the Cambridge Philosophical Society, have the tongue rough; though in their other characters, especially colour, they would seem to be Mr. Lowe's *Remora*. Cuvier, in his "Regne Animal," appears to consider the rough tongue as characteristic of the whole genus.



CONGER PUNCTUS. *Jen.*

*C. lateribus fasciis transversis fusciscenti-rubris, interstitiis angustis griseis: rostro brevi, obtuso; maxillis subæqualibus: pinnâ dorsali initium supra pectoralem capienti: cute corporis puncturis parvis creberrimè aggregatis impressâ.*

FORM.—Body much compressed, except at the anterior extremity. Depth less than one-eleventh of the entire length. Head contained about seven and a half times in the same. Snout short and rounded. Jaws nearly equal, the upper scarcely longer than the lower. Gape scarcely reaching beyond a vertical from the anterior part of the eye. Teeth velutine. A row of very conspicuous pores round the edges of both jaws. The whole body, but not the head, thickly studded all over with small pores, much crowded, and appearing like pin-holes.

The pectorals are rather more than half the length of the head. The dorsal commences immediately above them, and has a moderate elevation of about one-third of the depth. The vent is a little posterior to the termination of the first third of the length, and the anal is immediately behind it. The dorsal and anal unite to form a moderately pointed caudal.

Length 3 inc. 3 lines.

COLOUR—(*In spirits.*) Sides very regularly banded with fourteen or fifteen transverse reddish brown fasciæ: the fasciæ extend on to the dorsal fin, and are much broader than the intervening spaces. All the under part of the head, belly as far as the vent, an irregular patch on the cheeks, and the spaces between the bands on the sides, yellowish.

Habitat, Tierra del Fuego.

This appears to be a new species. The individual described above is quite small, and stated in Mr. Darwin's notes to be the young of another and larger specimen which he also captured, but of which he does not mention the exact size, and which unfortunately does not appear in his collection. He has, however, mentioned the colours, which appear similar to those given above, and are as follows:—"Sides with transverse bars of chocolate and brownish-red, separated by narrow grey spaces." Whether the form and proportions of the adult agree exactly with those of the young as above detailed must be left for future observers to determine. The colours, however, appear well to characterize the species, aided by the minute punctures with which the whole body is covered.

This species was taken by Mr. Darwin at the roots of fucus, at the east entrance of Beagle Channel, Tierra del Fuego. The larger specimen is said to have been very active.

1. MURENA LENTIGINOSA. *Jen.*

*M. purpurascenti-fusca; maculis circularibus, parvis, flavis: capite et rostro valde compressis; fronte declivi: maxillis subelongatis, angustis, æqualibus, acutis; dentibus acutis, in maxillâ superiore anticis uni-lateralibus bi-seriatis; in inferiore*



*anticis bi-lateralibus uni-seriatis ; in vomere uni-seriatis ; anticis supra subtusque, lateralibus secundariis supra, et vomerinis, fortibus : pinnâ dorsali anticè obsoletâ.*

LONG. unc. 20. lin. 6.

FORM.—Very much compressed about the head and jaws. Body tapering posteriorly; the depth in the middle equalling about one-thirteenth of the entire length. Head, measured to the branchial orifice, about one-seventh. Profile falling obliquely in a straight line from the nape to the extremity of the snout. Jaws very narrow, rather lengthened and sharp-pointed, equal. Gape deeply cleft, reaching as far back behind the eyes as it advances before them. Teeth compressed at the sides, very sharp, slightly hooked and pointing backwards; above, in a single row in front, in two rows at the sides; below, in two rows in front, and in a single row at the sides; in each case, however, the secondary row is very imperfect, some of them appearing to have been lost; also a row down the vomer, but interrupted in the middle of the series: the front teeth above and below, and the secondary ones at the sides of the upper jaw, are much stronger than the others; but the first three on the vomer, being those anterior to the blank space, are perhaps longer and more developed than any in the jaws. Two tubular orifices above the eyes, and two at the extremity of the snout. Eyes distant from the end of the snout twice their own diameter. Branchial orifice of the same size as the eyes. Three or four large pores arranged in a line along the edge of the upper jaw, but none apparent on the lower.

Dorsal fin thick and fleshy, and not very distinguishable from the body, excepting posteriorly, so that its exact point of commencement cannot be fixed with precision. Vent a trifle in advance of the middle point of the entire length. Anal fin still less distinguishable than the dorsal.

COLOUR.—“Fine dark purplish brown, with yellow circular spots.”—D.—The spots are mostly small, and many of them not bigger than large pin’s heads. They are smaller and more crowded about the head than elsewhere, giving a freckled appearance.

A second specimen is smaller than the above, measuring thirteen inches and a half in length. This specimen has the teeth more perfect. In the upper jaw, there is first an outer row reaching all round, in which the teeth are mostly small and regular, but towards the front mixed with some much longer ones; behind this, about the middle of the sides, is a short secondary row consisting of five or six teeth as long as those in front in the first row: in the lower jaw, the secondary row consists likewise only of four or five long teeth, but here they are placed in front instead of at the sides. Mr. Darwin’s notes respecting the colours of this smaller specimen are as follows: “Dark reddish-purple brown, with pale, or whitish-brown spots: eyes bluish.”

Habitat, Galapagos Archipelago.

The larger of the two specimens above described was taken by Mr. Darwin at Charles Island, the smaller one in tidal pools at Chatham Island, in the Galapagos Archipelago. It appears to be an undescribed species, though bearing much similarity to the *M. Meleagris* of Shaw.



2. *MURÆNA OCELLATA*.

*Gymnothorax ocellatus*, *Spix et Agass.* Pisces Brazil. p. 91. tab. 50 b.

FORM.—Head but moderately compressed. Snout rather short and blunt. Jaws equal. Gape reaching a little beyond the posterior part of the orbit. Teeth apparently in only a single row above and below, very strong and sharp at the extremity of the jaws: none at the anterior part of the vomer, but a few very short ones not easily seen at the back part of the median line of the palate. Two tubular orifices at the extremity of the snout, but above the eyes only two simple pores not prolonged into tubes. Eyes rather large, much exceeding in size the branchial orifice; scarcely more than one diameter between them and the end of the snout. Two or three large pores along the edges of both jaws. Dorsal very distinct, commencing above the branchial orifice. Vent a little before the middle. Tail gradually tapering to a rather fine point.

Length 12 inc. 9 lines.

COLOUR.—(*In spirits.*) Head and trunk brown, with round whitish spots. Dorsal and anal spotted with black and white, the black spots occupying the edge of the fin. Extremity of the tail imperfectly banded with white and dusky brown. Belly pale.

Habitat, Rio de Janeiro.

This elegant and well-marked species, first discovered by Spix on the Brazilian coast, was taken by Mr. Darwin in the harbour of Rio de Janeiro.

3. *MURÆNA* — ?

FORM.—Head moderately compressed, rising considerably at the nape. Body slender, somewhat ensiform behind, and tapering towards the tail. Snout of moderate length. Jaws equal, or the upper one perhaps a very little longer than the lower. Gape reaching as far behind the eye, as it advances before it. Teeth partially in two rows above, in one below; sharp and strong at the extremity of the jaws, and on the anterior part of the vomer. Two tubular orifices at the extremity of the snout, but only simple pores above the eyes. Three or four large pores along the edges of the upper and under jaws. Eyes distant one diameter and a half from the end of the snout. Dorsal distinct, commencing almost on the occiput, and in advance of the branchial orifice. Vent before the middle. Anal commencing a little behind it, and, like the dorsal, distinct, but rather less so.

	in.	lin.
Length . . . . .	10	0
Depth, fins not included . . . . .	0	6
From end of snout to branchial orifice . . . . .	1	4
From the same to vent . . . . .	4	3

COLOUR.—(*In spirits.*) Rather dark brown, nearly uniform, but here and there with lighter mottlings. The lower jaw appears to have had a row of whitish spots encircling the pores.

The species of *Muræna* above described was taken by Mr. Darwin at Porto Praya, Cape de Verds. The individual being small, and possibly not having attained its permanent characters, I have forborne giving it any name, though I have not been able to identify it in the works of authors.



## 4. MURÆNA — ?

FORM.—Snout rather compressed before the eyes, not very long, and slightly obtuse. Upper jaw a very little in advance of the lower. The gape extends behind the eyes, but the posterior portion is not equal to the anterior. The teeth, tubular orifices, and pores, are very much the same as in the species last noticed. Dorsal very distinct, commencing in advance of the branchial orifice. Anal not so distinct as the dorsal.

Length 5 inc. 6 lin.

COLOUR.—Brown, but with some lighter specks and mottlings, more particularly on the lower jaw and on the fins.

Taken by Mr. Darwin at Tahiti. Probably a new species, but, as in the last case, the specimen is young and not easily determinable.



## LOPHOBRANCHII.

## FAMILY.—SYNGNATHIDÆ.

1. SYNGNATHUS ACICULARIS. *Jen.*

PLATE XXVII. fig. 3.

*S. flavo-brunneus* : corpore gracillimo, compresso, heptagono ; caudâ quadrangulâ : vertice plano ; cristâ occipitali parum conspicuâ ; rostro longo, compresso, verticaliter capite angustiore, margine superiore acuto prope recto : pinnâ dorsali totâ multum ante medium longitudinis sitâ ; pinnis pectoralibus parvis, anali minutissimâ, caudali distinctâ.

LONG. unc. 5. lin. 10.

FORM.—Very similar to the *S. Acus*, but the body rather more compressed. The angles are the same, and the middle lateral ridges of the trunk rise upwards in a similar manner to terminate behind the dorsal fin. There are about seventy transverse shields or plates in the whole length, eighteen of which lie between the gills and the vent. Head much compressed about the gills, contained with the snout about eight and a half times in the entire length. Crown nearly flat, with very little of an occipital ridge ; profile falling obliquely, but not much out of a straight line ; between the eyes a slight hollow. Snout elongated, a trifle more than half the entire length of the head, compressed, the upper edge sharp and nearly horizontal in front of the nostrils, vertically much narrower than the head.

The dorsal commences at one-third of the entire length, and occupies a space about one-tenth of the same, terminating before the middle : the number of rays is about forty or more. Vent about underneath the seventh dorsal ray. Anal extremely minute, of only one or two rays. Pectorals very small. Caudal distinct, much as in *S. Acus*.

COLOUR.—(*In spirits.*) Of a nearly uniform yellowish brown, paler underneath.

Habitat, Valparaiso.

This species, taken by Mr. Darwin at Valparaiso, would seem to represent in that quarter of the globe the *S. Acus* of the European seas, which, on the whole, it much resembles, though there are several slight differences on a close comparison. It is a female specimen, being without the abdominal pouch, and is probably not full-sized. The dorsal fin being a little injured, and the rays very delicate as well as close-set, it is hardly possible to tell the exact number. The anal exists, but it is so extremely minute that it might easily be overlooked.

2. SYNGNATHUS CONSPICILLATUS. *Jen.*

PLATE XXVII. fig. 4.

*S. griseus*, fasciis transversis fuscis ; genis albicantibus, vittis duâbus angustis longitudinalibus nigro-fuscis : corpore crassiore, subcylindrico, hexagono ; caudâ quadrangulâ : vertice elevato ; cristis occipitali et nuchali distinctis : oculis magnis pro-



*minulis : fronte declivi, in descensu sinuato : rostro brevi, gracillimo, subcylindrico : pinnâ dorsali paulo ante medium longitudinis desinenti : ano infra radium primum dorsalem sito : pinnis pectoralibus parvis, anali minutissimâ ; caudali distinctâ.*

D. 31 ; A. 3 ? ; C. 10 ; P. 14.

LONG. unc. 4. lin. 7.

FORM.—Body rather thick and somewhat cylindrical; the greatest depth and thickness nearly equal, the former being about one-twenty-seventh of the entire length. From the head to the vent hexagonal, the middle lateral ridges terminating abruptly, when opposite the commencement of the dorsal fin, without inclining either upwards or downwards. Fifteen transverse plates between the gills and the dorsal fin: only fifty-four in all, the tail not tapering so much as in many other species. Head much pinched in at the gills, but rather full and protuberant about the cheeks: its length ten and a half times in the entire length. Crown high and convex: a ridge commencing at the occiput passes backward to the nape. Eyes large and full, with somewhat of a spectacled appearance; their diameter equal to the whole depth of that part of the head; the orbits rising in ridges above them, with the intervening space concave. From between the eyes the profile descends in a sinuous curve to the base of the snout, which is short, slender, very narrow, and almost cylindrical. The length of the snout is less than half the entire length of the head; its breadth, vertically, only one-third the depth of the same taken behind the eyes.

The dorsal commences beyond one-third of the entire length, occupies one-ninth of the same, and terminates a little before the middle: nearly even, and rather high, more than equalling the depth of the body underneath. Vent about underneath the first ray, but almost in advance of the dorsal fin altogether. Anal extremely minute. Pectorals very small. Caudal rays distinct.

COLOUR.—Trunk greyish-brown, with deep brown interrupted transverse fasciæ. In front of the dorsal, the fasciæ terminate at the middle lateral ridge, below which the sides are spotted. Dorsal fin also a little spotted. Cheeks whitish, with two very distinct narrow longitudinal vittæ extending backwards from the eyes to the posterior part of the opercle.

Habitat, Tahiti.

A well-marked species, and apparently undescribed. The only specimen in the collection is a female, and, like the last, perhaps not full-sized.

### 3. SYNGNATHUS CRINITUS. *Jen.*

PLATE XXVII. fig. 5.

*S. griseus ; ventre, et maculâ operculari, nigricantibus : corpore crassiore, antice heptagono, postice quadrangulo, angulis acutis : vertice parum elevato ; cristis occipitali et nuchali distinctis : rostro brevissimo, subcylindrico, capite angustiore, postice supra carinato, apice subrecurvo : cirris duobus, minutis, filamentosis, palpebralibus : pinnâ dorsali paulo ante medium longitudinis desinente ; ano infra initium ejus sito : pinnis pectoralibus et caudali parvis ; anali nullâ.*

LONG. unc. 3. lin. 5.



FORM.—Body thickish, the greatest depth and thickness nearly equal, the former about one-twenty-fifth of the whole length. From the head to the vent heptangular; tail quadrangular: all the angles sharp and distinctly marked. The middle lateral ridges in the heptangular portion pass downwards at their extremities to terminate at the vent. Sixteen transverse plates before the dorsal: only fifty-two in the whole length. Head short, about one-eleventh of the entire length, not more compressed than the body. Crown not much elevated, but with distinct occipital and nuchal ridges. Orbits rising in ridges above the eyes, the interocular space being hollowed out: also a ridge commencing between the eyes, and passing forwards along the base of the snout, but not reaching to its extremity. Snout itself very short, its length only one-third the entire length of the head, narrower than the head vertically, nearly cylindrical, the tip slightly recurved. A few very short minute filamentous threads scattered about the head, more particularly one over each eye.

Dorsal placed much as in the last species, and terminating a little before the middle; the rays delicate and not easily counted, about twenty. Vent beneath the commencement of the dorsal. No anal distinguishable even under a lens. Pectorals very small. Caudal moderately distinct.

COLOUR.—Grey: a spot on the gill-cover, and the belly, dusky. The carinae which form the edges of the under surface of the body are darker still, and shew a fine dark line on each side extending to the caudal.

Habitat, Bahia Blanca, Northern Patagonia.

Apparently another new species of this genus, taken by Mr. Darwin at Bahia, and, like the last, well-marked; especially by the short filaments above the eyes, which I am not aware occur in any other known species.



## PLECTOGNATHI.

## FAMILY.—TETRODONTIDÆ.

1. DIODON NYCTHEMERUS. *Cuv.*

*Diodon nycthemerus*, *Cuv.* Mém. du Mus. tom. iv. p. 135. pl. 7.

A species of *Diodon* in Mr. Darwin's collection, the number attached to which has been lost, and of which the locality is in consequence unknown, appears referable to the *D. nycthemerus* of Cuvier.

The spines are long, measuring three quarters of an inch in length; round, sharp, and not very close together. There are five in the front row between the eyes, seven in a transverse row between the pectorals, and ten or eleven between the snout and the dorsal in a longitudinal one: none exactly on the upper part of the tail, but one on each side of the base of it, a little below the termination of the dorsal fin, and a corresponding pair still lower down. The spines on the belly are shorter, and rather closer together than those on the back. One of those on the back in this specimen is accidentally forked.

The true teeth appear on the surface of the jaws like minute scales, as in several species of the genus *Scurus*.

The fin-ray formula is as follows:

D. 13; A. 13; C. 9; P. 20.

Length 5 inches 6 lines.

The colours, so far as can be judged, the specimen being in spirits and not in very good condition, answer to Cuvier's description of them with tolerable exactness.

2. DIODON RIVULATUS. *Cuv.*

*Diodon rivulatus*, *Cuv.* Mém. du Mus. tom. iv. p. 129. pl. 6.

An individual apparently of this species was picked up by Mr. Darwin on the shore of the Rio Plata at Maldonado. It agrees with Cuvier's description, excepting that the undulating lines are not visible, probably owing to the state of the specimen when found.

The spines are short, barely a quarter of an inch in length, but very strong, compressed, and resembling canine teeth. There are three in the first row between the eyes; about six in a transverse row across the back, and seven or eight in a longitudinal one. Beneath they are shorter and more numerous. The orbits are elevated in ridges, and project forwards over the eyes. Two very small barbules attached to the lower lip. Surface of the jaws smooth, the teeth not appearing as scales.

D. 11; A. 10; C. 8; P. 22.

Length 5 inc. 3 lin.



As Cuvier observes, the *D. geometricus* of Bl. and Schneid.\* approaches very closely this species, and I can hardly think it to be distinct. Yet neither in Mr. Darwin's specimen, which in all other respects agrees exactly with Schneider's figure, do I discern any appearance of the hexagonal meshes on the surface of the body.

### 3. DIODON ANTENNATUS. Cuv.?

*Diodon antennatus*, Cuv. Mém. du Mus. tom. iv. p. 131. pl. 7.

A third species of *Diodon*, brought home by Mr. Darwin, and taken by him at Bahia, in Brazil, is either the young of the *D. antennatus* of Cuvier, or else new; but the only individual in the collection is quite small, and not more than an inch in length, excluding caudal. The fleshy filaments above the eyes, which, according to Cuvier, so peculiarly distinguish the *D. antennatus*, are very distinct,—but I see none on the sides. The ground colour would seem darker than he describes, so as to render the spots and markings on the upper parts not distinguishable from it now, if they ever existed. In spirits it appears of a nearly uniform deep brown red. The spines, or rather papillæ, are also shorter than represented in his figure; but this may be only the effect of immaturity.

According to Mr. Darwin, the colours when recent were as follows:—"Above blackish brown, beneath spotted with yellow. Eye with the pupil dark blue; iris yellow, mottled with black." It is added:—"On the head four soft projections; the upper ones longer, like the feelers of a snail."

Mr. Darwin observes, "that the dorsal, caudal, and anal fins, in this species, are so close together that they act as one: these, as well as the pectorals, are in a continued tremulous motion even when the fish is otherwise motionless. The animal propels its body by using the posterior fins in the same manner as a boat is sculled, that is, by moving them rapidly from side to side with an oblique surface exposed to the water. The pectoral fins have great play, which is necessary to enable the animal to swim with its back downwards."

Mr. Darwin made some further observations on the habits of this species, which have already appeared in his "Journal," to which I may refer the reader.† The tendency of them is to explain the process by which the water and air are absorbed, when the *Diodon* distends itself into a spherical form; and to show that the fish *can* swim, when floating in this state with its back downwards, which Cuvier doubted. He thinks that the water is taken in partly for the sake of regulating its specific gravity. He also notices a curious circumstance with respect to this species, viz., "that it emitted from the skin of its belly, when handled, a most beautiful carmine red and fibrous secretion, which permanently stained ivory and paper."

\* *Syst. Ichth.* pl. 96.

† pp. 13, 14.



1. TETRODON AEROSTATICUS. *Jen.*

*T. capite, dorso, lateribus, et pinnâ caudali, nigro-maculatis; ventre turgidissimo, fasciis obliquis nigris: corpore undique muricato, caudâ solum exceptâ: capite brevi; fronte inter oculos paululum depresso: maxillis æqualibus: lineâ laterali nullâ: pinnâ dorsali omnino ante analem positâ: pinnâ caudali subrotundatâ.*

D. 11; A. 10; C. 10; P. 11.

LONG. unc. 2. lin. 6.

FORM.—Head short. Body approaching to globular, with the skin of the belly extremely loose and capable of great inflation; every where beset with minute prickly asperities, the extreme end of the tail alone excepted. Crown nearly flat, very slightly depressed between the eyes. Jaws equally advanced. Nostrils tubular. No appearance of any lateral line. Dorsal entirely in advance of the anal: both these fins small. Caudal slightly rounded.

COLOUR.—(*In spirits.*) Head, back, and sides to the depth of the pectorals, greyish brown, spotted with black; the spots very small and crowded on the back, but becoming larger on the flanks and tail. Belly white, with deep black oblique broad bands, inosculating in some places, so as to form large meshes. Dorsal, anal, and pectorals, plain; but the caudal very elegantly and distinctly spotted.

The ticket attached to this specimen has been lost, and its locality is in consequence unknown. In general appearance, it very much resembles the *T. lineatus* of Bloch, of which it may possibly be a variety; but it would seem to differ from that species, in having the forehead less elevated; in wanting the lateral line altogether, of which I can discover no trace; and in having the whole back and upper part of the sides spotted, and not merely the tail and its fin, as is represented in the *T. lineatus*.

2. TETRODON IMPLUTUS. *Jen.*

*T. sordidè metallico-olivaceus, maculis circularibus albis; ventre albo, lineis olivaceis longitudinalibus, haud admodum turgido: corpore suboblongo, magnâ ex parte lævissimo, ventre solum muricato: maxillis subæqualibus: naribus tubulosis, bifurcatis: lineâ laterali distinctâ, parum tortuosâ: pinnâ dorsali anali paulo anteriore: pinnâ caudali æquali.*

D. 10; A. 10; C. 11; P. 16.

LONG. unc. 4. lin. 9.

FORM.—Approaching to oblong, the belly a little ventricose. Head not so short as in the last species, nor yet much produced. Body every where smooth, excepting the middle of the abdomen from beneath the pectorals to the vent, and not very prickly here. Top of the head slightly depressed between the eyes. Jaws nearly equal; the upper one, if any thing, a very little in advance. Nostrils tubular, the tubes forked from the bottom into two equal branches.



The lateral line, which is very distinct, commences behind the mouth, whence it passes under and partly encircles the eye, then arches upwards, making a long sweep, and not descending till it gets above the anal, whence it proceeds nearly along the middle towards the caudal, but loses itself before attaining to that fin. Dorsal fin rather in advance of the anal. Caudal square.

COLOUR.—“Dirty metallic olive-green, with white circular spots; belly white, with streaks of the same colour as the back.”—D. The spots extend on to the basal half of the caudal, but are smaller here than on the body. A white annulus encircles each eye, and a similar one is described round the base of each pectoral. The abdominal streaks run very exactly parallel with the axis of the body, not obliquely as in the last species.

Habitat, Keeling Islands, Indian Ocean.

I can find no species noticed by authors exactly corresponding with the one described above, which was obtained by Mr. Darwin at the Keeling Islands. The form is similar to that of the *T. Honckenii* of Rüppell,\* but the colours appear different. On the other hand, the markings resemble those of the *T. testudineus* of Bloch, but that species is rough all over.

### 3. TETRODON ANNULATUS. *Jen.*

*T. dorso et lateribus nigro-fuscis, maculis circularibus atris; infra niveus: corpore oblongo, haud admodum ventricoso, ubique sed parcè muricato, rostro et caudâ exceptis: capite grandiusculo, spatio interoculari lato, parum depresso: maxillis subæqualibus: naribus cylindræis, recumbentibus, aperturis duabus lateralibus: lineâ laterali in capite tortuosissimâ: pinnâ dorsali vix anali anteriore: pinnâ caudali æquali.*

D. 8; A. 7; C. 9, &c.; P. 15.

LONG. unc. 9.

FORM.—Oblong: head rather large; the snout a little more produced than in the last species. Moderately ventricose, and apparently capable of a certain degree of inflation. No where perfectly smooth, except on the snout, tail, and here and there on the flanks; nor very rough, the prickles being minute and rather scattered, most apparent on the back, nape, (whence they advance to quite between the eyes,) and the middle of the abdomen. The interocular space is broad, equalling two and a half diameters of the eye at least, and a little hollowed out. Jaws nearly equal, the upper one perhaps a very little in advance. Nostril in the form of a small recumbent cylinder, with an opening at each extremity. Dorsal very little in advance of the anal; the first ray in each of these fins very short. Caudal square.

The lateral line is very tortuous, especially about the head. It commences at the bottom of the gill-cover, whence it ascends vertically behind the eye towards the crown, then passes over the eye towards the snout, descends again beneath the nostril to form a great loop in front of the eye, almost reaching to the corners of the mouth, whence it returns beneath the eye,

\* Surely this cannot be the same as the *T. Honckenii* of Bloch?



and, crossing its former course nearly at right angles, proceeds along the upper part of the side, getting lower as it approaches beneath the dorsal, to terminate at the caudal. There are also two short transverse lines; one across the snout, connecting the loops; another across the nape, connecting the two main lines after they have assumed the usual direction.

COLOUR.—“Beneath snow white. Above dark brownish-black, this colour forming a series of broad oval rings, one within another; the outer and largest ring includes nearly the entire surface of the back and sides. The upper surface is, in addition, marked with round spots of a darker shade. Pectoral and dorsal fins yellowish brown. Iris, inner edge clouded with orange; pupil dark green-blue.”—D.—In its present state, there is no indication of the rings noticed above. The spots, which are small, and cover nearly the whole head, back, and sides, appear also sparingly on the basal half of the caudal, but not on any of the other fins.

Habitat, Galapagos Archipelago.

This species was taken by Mr. Darwin at Chatham Island, in the Galapagos Archipelago. He observes in his notes that it makes a loud grating noise. It is remarkable for the great tortuosity of the lateral line. The form of the nostrils is also rather peculiar.

#### 4. TETRODON ANGUSTICEPS. *Jen.*

PLATE XXVIII.

*T. supra obscure viridis: capite oblongo, subcompresso, spatio interoculari multum contracto: corpore infra ventricosum, ubique lævissimo, duobus, in summo dorso, cirris cutaneis parvis adornato: maxillis subæqualibus: naribus tubulosis, indivisis, aperturis duabus lateralibus: lineâ laterali in capite tortuosissimâ: pinnâ dorsali omnino ante pinnam analem; caudali æquali.*

D. 8; A. 7; C. 9; P. 15.

LONG. unc. 9. lin. 3.

FORM.—Rather more elongated than the last species; especially in regard to the head, which is also more compressed upwards, reducing the space between the eyes to a narrow channel, much hollowed out, and not exceeding one diameter of the eye. Body inflatable, every where quite smooth. Jaws nearly equal, the upper one perhaps a very little in advance. Nostrils tubular, with two lateral apertures, somewhat similar to those of the last species, but more elevated. Lateral line similar, taking the same windings on the head. A little behind the transverse line on the nape, and nearly above the attachment of the pectoral, are two small skinny appendages: there is also a very minute one on each side of the tail, but none elsewhere. Dorsal wholly before the anal. Caudal square.

COLOUR.—“Above dull green: base of the pectorals and dorsal black; a white patch beneath the pectorals.”—D.—The colours must have very much altered from the action of the spirit, as it now appears of a nearly uniform reddish brown, only paler beneath.

Habitat, Galapagos Archipelago.

Another apparently undescribed species of this genus, taken by Mr. Darwin at the same place as the last. He observes in his notes that it is inflatable.



## FAMILY.—BALISTIDÆ.

1. BALISTES VETULA. *Bl.*

*Balistes Vetula*, *Bloch*, *Ichth.* tab. 150.

————— *Duperrey*, (*Voyage*) *Zoologie*, p. 114, pl. 9. fig. 2.

FORM.—Body deep, subrhombic, very much compressed; the greatest depth equalling half the entire length. Tail unarmed. Three or four larger scales than the others behind the branchial orifice. Pelvic bone projecting, prickly, connected with which is a fin consisting of about nine pairs of short rays. Above this fin, and parallel to its base, are two or three rows of short spines, but not much developed. First dorsal of three spines, commencing above the pectoral; first spine very strong and rough, the third not much smaller than the second. Second dorsal, and anal, which answer to each other, nearly even throughout, the anterior rays not being prolonged beyond the others. The caudal is injured, and its exact form cannot be determined. No lateral line.

D. 3—30; A. 27; C. 12; P. 14.

Length 1 inc. 10 lin.

COLOUR.—(*In spirits.*) Yellowish grey, becoming paler beneath. Three or four dark transverse streaks across the head from eye to eye: beneath the eye one or two indistinct streaks, passing off towards the branchial orifice: also two very distinct longer ones commencing on the upper part of the snout before the eyes, and passing obliquely across the cheeks towards the roots of the pectorals, parallel to those last mentioned. Besides the above, there are several obliquely transverse interrupted lines on the sides of the body: in one specimen, these lines are not well defined; in another, they are distinct, but so much interrupted as to have the appearance of spots arranged in a linear series. Two or three transverse lines encircling the tail; and some remains of longitudinal stripes on the second dorsal and anal fins.

The above description is that of two very small specimens of a species of *Balistes* taken by Mr. Darwin in Lat. 14° 20' South, Long. 38° 8' West, about sixty-five miles from land. I have very little doubt of their being the young of the *B. Vetula* of Bloch. The only respects in which they appear to differ from that species are the oblique lines on the back being carried completely across the sides in the form of lines of spots, and the anterior portions of the second dorsal and anal fins not being prolonged in a point; but both these differences may be the effect of immaturity.

2. BALISTES ACULEATUS. *Bl.*

*Balistes aculeatus*, *Bloch*, *Ichth.* tab. 149.

————— *Benn.* in *Zool.* of *Beechey's Voy.* p. 69. pl. 22. f. 2.

FORM.—Body deep, subrhombic. Tail armed with three rows of prickles, eleven in the uppermost row, about nine or ten in the middle one, and five or six in the lowermost. A few larger scales than the others behind the branchial orifice. Pelvic bone very rough and prickly, the



spines that follow short, and not protruding much beyond the skin. First spine in the dorsal very strong, aculeated at the anterior edge, but not at the sides; no third spine in this fin. Second dorsal and anal even. Caudal rounded.

D. 2—24; A. 21; C. 12; P. 13.

Length 2 inc. 3 lin.

COLOUR.—Not noticed in the recent state. The ground colour has probably been altered by the spirit, but the markings are still very distinct, and accord tolerably with Bloch's figure, except that the oblique bands on the posterior part of the body, in front of and above the anal, are darker; while they alternate with four white ones, which are particularly conspicuous. Possibly these white bands may have been originally blue, as the narrow stripes descending from the eyes to the pectorals, which evidently were of that colour, are nearly faded to a white. There is also a white stain on each side of the tail, where the spines are, which appears to have been blue originally: the spines themselves are deep shining black.

This specimen shows the black transverse bands between the eyes, and the broad band passing from the eye to the pectoral, between the narrow blue ones above alluded to, all represented by Bloch, but not observed by Mr. Bennett in the specimen figured in the "Zoology of Beechey's Voyage."

Habitat, Tahiti.

The above specimen was taken by Mr. Darwin at Tahiti. It is quite small, and differs in some respects from the figures of Bloch and other authors, but it is evidently referable to the *B. aculeatus*. The species is probably subject to variation in respect of colouring.

#### 1. ALEUTERES MACULOSUS. *Richards.*

*Aleuterus maculosus*, *Richards.* in Proceed. of Zool. Soc. 1840. p. 28.

FORM.—Oval, somewhat approaching to fusiform behind, very much compressed. The greatest depth one-third of the entire length. Skin covered with little granular points, terminating in very minute bristles, and communicating a slight roughness to the touch, when the finger is passed from tail to head. Snout rather prominent and acute: jaws equal. Dorsal spine springing from above the middle of the orbit of the eye; strong, with four rows of sharp prickles at the four angles, pointing downwards, and very regularly set: second dorsal spine very minute. The second dorsal and anal fins have been lost in this specimen, and their form and number of rays cannot be determined. The pectorals are small, each with twelve rays. Caudal rounded, also with twelve rays.

Length 5 inc. 4 lines.

COLOUR.—"Mottled with pale blackish green, leaving white spots."—D.—In its present state, the skin is nearly gone from long maceration in impure spirit: such portions as are left accord well with Dr. Richardson's description, appearing of a mouse-grey, with darker mottlings. There are three or four rather indistinct dark *asciæ* across the caudal.



Habitat, King George's Sound.

I have scarcely any doubt of this being the *A. maculosus* described by Dr. Richardson, in his recently published notes on a collection of fishes from Van Diemen's Land. Mr. Darwin's specimen, which is in bad condition, was obtained by him in King George's Sound.

## 2. ALEUTERES VELUTINUS. *Jen.*

*A. pallide fuscescens, fasciis quatuor obscurioribus, longitudinalibus, indistinctis; pinnis pallide aurantiis: corpore oblongo-ovali elongato; cute delicate hispidâ, scabrâ: rostro producto, apice obtuso: spinâ dorsali aculeis lateralibus deflexis, uniseriatis: pinnis dorsali secundâ et anali multum ante caudalem desinentibus.*

D. 2—33; A. 31; C. 12; P. 13 vel 14.

LONG. unc. 8.

FORM.—Elongated, approaching to oblong-oval, the tail rather slender. Greatest depth exactly one-fourth of the entire length, and equalling the length of the head, this last being measured to the upper angle of the oblique branchial orifice. Back slightly arched, the curvature rather exceeding that of the belly. Profile in front of the dorsal spine falling very gradually, and not much out of the rectilineal. Snout considerably produced, but blunt at the extremity. Mouth small; jaws equal; teeth strong, and very sharp. Eyes round, placed exactly above the branchial orifice. The grains on the skin are coarser than in the *A. maculosus*, and the bristles springing from them longer and more developed, especially on the posterior part of the body, communicating a harsher feel to the touch: these bristles are slightly hooked at their extremities, the tips being turned towards the tail.

Dorsal spine strong, situate above the posterior part of the orbit, with only two principal rows of prickles, one on each of the two lateral edges; anteriorly granulated at bottom, with a few rudimentary prickles towards the apex, but posteriorly almost quite smooth. Second spine very minute. The distance from the first spine to the commencement of the second dorsal fin equals twice the length of that spine. The anal commences under the fifth dorsal ray, and ends nearly in a line with the termination of that fin, but extends a trifle further. Both fins fall short of the caudal by a considerable space. Pectorals rather small. The caudal is worn at the end, but appears to have been either square or slightly rounded.

COLOUR.—“Very pale brown: fins pale orange.”—D.

A second specimen is smaller than the above, measuring six inches and three-quarters in length. It is exactly similar in respect to form, and general colour; but the sides are marked with four tolerably distinct longitudinal bands, extending from the branchial orifice to the caudal, rather darker than the ground on which they are traced. There is very little indication of these bands in the first specimen.

Habitat, King George's Sound.

This species was taken by Mr. Darwin in King George's Sound, and appears to be new. It has some points of resemblance with the *Balistes Ayraud* of Quoy



and Gaimard, but in that the dorsal fin is said to extend to the caudal,\* which is far from being the case here. I have named it *velutinus*, in respect of the minute bristles which cover the skin, somewhat resembling the pile of velvet.

OSTRACION PUNCTATUS. *Schn.*

L'Ostracion pointillé, *Lacép.* Hist. Nat. des Poiss. tom. i. p. 455. pl. 21. fig. 1.

Ostracion punctatus, *Schneid.* Syst. Ichth. p. 501.

———*Meleagris*, *Shaw*, Nat. Misc. pl. 253.

This well-marked species of Ostracion, first described by Lacépède from Commerson's MSS., and afterwards figured by Shaw, in his "Naturalist's Miscellany," under the name of *O. Meleagris*, was obtained by Mr. Darwin at Tahiti, where it had been previously observed by Captain Cook.

There are two specimens in the collection, both exactly similar, and of the same size, measuring a trifle more than three inches and a half in length. They also accord well with Shaw's figure. Lacépède, in his description, speaks of the anal fin as being more extended than the dorsal, and as having eleven rays; but in both Mr. Darwin's specimens, I find the number of rays in these two fins the same. The formula is as follows:

D. 9; A. 9; C. 8; P. 10.

Schneider has noticed this species twice; first under the name of *lentiginosus*, and again under that of *punctatus*.

\* This character, though mentioned in the description, is not, however, represented in the figure. See *Freycinet's Voyage (Zoologie)*, pl. 47. f. 2.



## CYCLOSTOMI.

## FAMILY.—PETROMYZONIDÆ.

MYXINE AUSTRALIS. *Jen.*

FORM.—Scarcely differing from the *M. glutinosa*, but apparently rather more slender in proportion to its length. Mouth and cirriform appendages the same. Branchial orifices two, very near together, placed beneath, at a little beyond one-fourth of the entire length. A very conspicuous row of pores along each side of the abdomen. The tail seems somewhat sharper than in the *M. glutinosa*, and the rays of the low fin which turns round its extremity rather more distinct. Vent distant from the end of the tail rather less than one-eighth of the entire length.

Length 11 inc. 6 lin.

COLOUR.—“Above coloured like an earth-worm, but more leaden; beneath yellowish; head purplish.”—D.

Habitat, Tierra del Fuego.

Mr. Darwin obtained this species by hook amongst the kelp, in Goree Sound, and other parts of Tierra del Fuego, where he observes it is abundant amongst the rocky islets. Its extreme southern locality would suggest the idea of its being distinct from the *M. glutinosa* of the northern seas; yet the differences between the two, upon comparison, are very slight, and, if it really be so, as I have ventured to consider it, it requires an examination of more specimens to lay down its exact specific character.

Mr. Darwin has made some interesting remarks on the habits of this fish. He observes that it is “very vivacious, and retained its life for a long time; that it had great powers of twisting itself, and could swim tail first. When irritated, it struck at any object with its teeth; and by protruding them, in its manner, much resembled an adder striking with its fangs. It vomited up a *Sipunculus* when caught.” He adds, that he “observed a milky fluid transuding through the row of lateral pores.”



falling to the middle before losing itself in the caudal. Scales small, covering the whole head and body, except the snout in front of the eyes, the jaws, and the limb of the preopercle. The free portion of each scale marked with several small concentric circles, the free edge finely ciliated: the basal portion with a fan of seven striæ, and the spaces between these deeper striæ with minuter striæ running transversely: the basal margin cut square.

Pectorals attached rather low down, and a little posterior to the terminating angle of the opercle; their length about three-fourths that of the head: the fourth to the eighth rays longest; the first ray only half the length of the second; the first two, and the last three or four, simple; the rest branched. Ventrals about four-fifths the length of the pectorals, and in advance of those fins by nearly half their own length; their spine very distinct. First dorsal short, commencing immediately above the insertion of the pectoral: all the spines very slender, with the intervening membrane delicate; the second longest, equalling about half the depth; the third and following ones gradually decreasing. Second dorsal long, separated from the first by a very small interval, and occupying a space just equal to the distance between its commencement and the end of the snout: the rays gradually decreasing in length from the anterior ones, which equal three-fourths of the depth; all simple, or if branched, only so at their extreme tips. The interval between the second dorsal and the caudal contained eight-and-a-half times in the entire length. Anal commencing under the sixth ray of the second dorsal, or exactly at the middle point of the entire length, caudal excluded; extending a trifle beyond the second dorsal, but in other respects answering to that fin. Caudal square when spread, but very slightly notched when the rays are close; contained six-and-a-half times in the entire length; the principal rays branched.

COLOUR.—(*In spirits.*) Back and upper half of the sides pale olivaceous, with about seven or eight abbreviated, transverse, dusky fasciæ; beneath these are two irregular lines undulating longitudinally in a zig-zag manner, and having rather a tendency to meet at the angles, so as to form a connected longitudinal chain of diamond-shaped links. Lower portion of the sides and abdomen silvery. Tubal pores of the lateral line white, making this line very evident. Dorsal and caudal fins speckled with small dusky spots and points. Pectorals, ventrals, and anal, quite plain, and whitish.

A second specimen in the collection exactly resembles the above, except in being not quite so large, and in having a ray less in each of the two dorsal fins.

Habitat, Chonos Archipelago, W. coast of S. America.

The genus *Aphritis* was first established by M. Valenciennes, in the appendix to the eighth volume of the "Histoire des Poissons," for the reception of a small Percoid fish obtained by MM. Quoy and Gaimard in Van Dieman's Land, inhabiting fresh-water. The species above described, which was taken by Mr. Darwin in Lowe's Harbour, South of Chiloe, appears to be referable to the same genus. It differs, however, in many respects from the *A. Urvillii*, the only one which Valenciennes has noticed. The relative situation of the first dorsal with respect to the pectorals, and of the anal with respect to the second dorsal, is different: there are fewer rays in the anal, and more in the second dorsal: the upper, instead of the lower jaw, as represented in Valenciennes's figure, is



rather the longest; neither can I discern any teeth on the palatines, though there is a patch of very minute ones in front of the vomer.

That this species really belongs to *Aphritis*, would seem indicated not merely by the aggregate of its external characters, but by the internal structure also, which was examined in one of the two specimens brought home by Mr. Darwin, and found conformable to what is stated by Valenciennes, in this respect, of the *A. Urvillii*. The stomach is large, with four very distinct cæcal appendages, and there is no air-bladder.

The *A. undulatus*, which I have so named in reference to the undulating longitudinal lines on the sides, is very Cypriniform in general appearance, and not altogether unlike the common minnow, *Cyprinus Phoxinus*.

## 2. APHRITIS POROSUS. Jen.

*A. brevior*: pallide olivaceus, lateribus fasciis transversis obsoletis nigricantibus; pinnis omnibus brunneis: maxillâ inferiore, et limbo preoperculi, poris conspicuis circiter novem, suborbitalibus circiter quinque, seriatim dispositis.

D. 8—25; A. 1/22; C. 14, &c.; P. 23; V. 1/5.

LONG. unc. 2. lin. 5.

FORM.—Not so much elongated as the last species: the depth rather more than one-sixth of the entire length, and the head only four times in the same. Also distinguished by a row of large mucous pores on the lower jaw, passing upwards posteriorly, and continued along the limb of the preopercle: the number of these pores on each side is nine or ten: a row of similar pores, amounting to about five, passes backwards from a little above the end of the maxillary beneath each eye. In other respects, the form is similar to that of the last species, excepting that the interval between the second dorsal and the caudal is only one-eighth of the entire length, in consequence of the body being less elongated.

COLOUR.—(*In spirits*). Back and upper half of the sides, olivaceous brown; beneath silvery. No very obvious markings; but traces may be seen of six or seven transverse dusky fasciæ, reaching from the back to a little beneath the lateral line, which were probably more distinct in the recent state. All the fins brownish; the dorsal a little powdered with dusky specks. The fourth and fifth rays of the ventrals are white, and appear to have been always of a different colour from the rest of the fin.

Habitat, Coast of Patagonia.

This appears to be another new species of *Aphritis*, taken by Mr. Darwin on mud-banks, in Port Desire, central Patagonia. It is very closely allied to the *A. undulatus*, but, I conceive, certainly distinct. There is but one specimen in the collection.



## FAMILY.—SCORPÆNIDÆ.

## APISTUS ——— ?

Mr. Darwin's collection contains a species of this genus procured in King George's Sound, New Holland, which, from the bad state of preservation of the specimen, it is scarcely possible to identify with certainty. Possibly it may be new, as it does not seem to accord very exactly with any of those described in the "Histoire des Poissons;" but I shall not consider it such, nor do more than point out a few of its more obvious characters.

It is not determinable, whether it was originally one of the naked species of this genus, or whether the scales have been rubbed off, but probably the former. The suborbital and preopercular spines are strong, and considerably developed: the former reaches back further than the maxillary, and nearly to the posterior part of the orbit, and has another very small spine at its base. The lower jaw advances beyond the upper. The head is about one-third of the entire length. The eyes are large, their diameter being contained about three and a half times in the length of the head. The dorsal commences in a line with the ascending margin of the preopercle. The first spine is half the length of the second; the second is a little shorter than the third, which is longest, and equals two-thirds of the depth of the body; the fourth and succeeding ones decrease very gradually; the soft portion of this fin is a little higher than the hinder part of the spinous. The first anal spine is rather more than half the length of the second, which is the strongest of the three, though not much longer than the third. The pectorals are rather pointed, and a little shorter than the head. The ventrals are attached a little behind the pectorals, and are not very much shorter than those fins.

The following is the fin-ray formula:

D. 13/9; A. 3/6; C. 11, &c.; P. 11; V. 1/5.

Length 4 inches 6 lines.

The species to which this approaches nearest would seem to be the *A. niger* of Cuvier and Valenciennes; but there is no appearance of the small elevations on the skin resembling hairs, which those authors mention in their description of this last, and, on the whole, I am inclined to consider it as distinct.

## AGRIOPUS HISPIDUS. p. 38.

Notwithstanding what I have advanced in regard to this species, further consideration has inclined me to suspect, that it may prove ultimately only the young of the *A. Peruvianus*. In that case, however, it would appear that the absence of vomerine teeth can only be assigned as a character of this genus in the adult state.



## FAMILY.—SCIÆNIDÆ.

OTOLITHUS ANALIS. *Jen.*

This new species of *Otolithus* is from Callao : it was omitted to be noticed in the body of the work. There is but one specimen in the collection, in bad condition, and not admitting of a very detailed description ; but it is evidently distinct from all the species described by Cuvier and Valenciennes.

It is rather more elongated than the *O. Guatucupa*, the depth being not much more than one-fifth of the entire length. The head is long, and contained three and a half times in the same. The lower jaw is considerably the longest. The teeth above are small, and sharp-pointed, apparently in two rows, the outer row being a little stronger than the inner : there are two very strong canines in front, springing from between the rows. Below, the teeth are in two rows in front, and one at the sides ; those in front small, but those at the sides unequally sized, three or four, standing at intervals, being much stronger than the others, and very sharp. Diameter of the eye about one-sixth the length of the head ; its distance from the end of the snout one diameter and a half.

The lateral line is continued to the extremity of the caudal, between the ninth and tenth rays. There is a small interval between the two dorsal fins. The second dorsal, as well as the anal, are longer than in the *O. Guatucupa*, with more soft rays, especially the anal. The pectorals are narrow and pointed, and between one-half and two-thirds the length of the head. The ventrals are attached almost exactly beneath the pectorals. The caudal appears to have been square.

D. 9—1/24 ; A. 1/16 ; P. 17 ; V. 1/5.

Length 12 inches.

COLOUR.—The colours were not noticed when recent, and can hardly be judged of now. The general tint appears to have been silvery. If there were any markings, no traces of them remain.

Habitat, Callao, Peru.

This species has a longer anal than any of the American species described by Cuvier and Valenciennes. I have in consequence named it *analys*.

## PRIONODES FASCIATUS. p. 47.

It has been suggested that this may be nothing more than a monstrosity. Whether this be really the fact or not, can only be determined by the examination of more specimens. But in either case, I am so satisfied now of its being a *Serranus* in all its essential characters, that I conceive it never can be placed in a different family from that genus. If the fact be established of its never possessing vomerine and palatine teeth, such a character can, at the very utmost, serve only to distinguish it as a subgenus in that group. But every day is bringing more and more to light the small value of that character.



## STEGASTES IMBRICATUS. p. 63.

I am informed by Mr. Lowe, of Madeira, that this is the same as the *Glyphisodon luridus* of Cuvier and Valenciennes.\* Their description is so short, that I failed to recognize it; and I was induced to consider it as a new genus from the circumstance of its possessing vomerine teeth. Whether these teeth exist in any other species, or have only been presumed absent in all, because not found in some, I am not aware. But here again we see how little such a character is to be depended upon.

## FAMILY.—BLENNIDÆ.

Mr. Darwin's collection contains two new forms from South America, closely allied to each other, yet forming distinct genera, and which will not enter into any of those described by authors. At first it was conceived that they were Malacopterygian fishes, more especially from their having all the rays in the dorsal and anal fins articulated; and to belong to the Apodal division of that group, from their being supposed to be without ventrals; but, on a closer inspection, the ventrals, which are very small, were found to have been overlooked, and it was evident altogether that the true place of these fishes in the system was amongst the *Blennidæ*. The mention of this circumstance will explain why they were omitted to be noticed in their proper place.

These two genera, so far as can be judged from the situations in which Mr. Darwin obtained them, have the same habits as the Blennies, lurking under stones and weeds; and I propose to give them respectively the names of *Iluocætes* and *Phucocætes*.

## GENUS.—ILUOCÆTES.\* Jen.

*Corpus elongatum, antice subcylindricum, postice compressum, ensiforme, læve, nudum, alepidotum. Rostrum breve, obtusum, rotundatum, ultrà maxillam inferiorem productum. Dentes acuti, subconici, in utràque maxillâ uniseriati: supra canini duo fortes, curvati, antici, et præ serie exstantes: in vomere dentes pauci acuti aggregati; in utroque palatino uniseriati. Lingua lævis. Oculi grandes, prominuli. Apertura branchialis mediocriter fissâ, membranâ quinque-radiatâ. Maxillæ, os suborbitale, et præoperculum, tubiporis cutaneis brevibus ad margines fimbriatæ. Pinnæ ventrales jugulares, minutæ, gracillissimæ, triradiatæ. Pinnæ dorsalis et analis prælongæ, caudali coalescentes, radiis omnibus articulatis.*

If I am right in placing this new genus amongst the *Blennidæ*, it will evidently take its place next to *Zoarces*, to which it is more nearly allied than to any other

\* *Hist. des Poiss.* tom. 5. p. 356.

† *Ab αλυσ limus, et κοιτη cubile.*



group in that family. It agrees especially with *Zoarces*, not only in general form, but in having all the dorsal and anal rays articulated, (excepting one in the dorsal, which possibly may be an accident in the only specimen examined,) and in having the ventral fins extremely small. On the other hand, it departs from that genus, in having the body entirely naked, and free from scales; in the two remarkable canines in front of the upper jaw, and in having teeth on the palate; also in having no notch at the posterior part of the dorsal. It is further remarkable for its large prominent eyes, and the rows of tubipores on the cheeks. Amongst the true Malacopterygians, it approaches nearest to *Ophidium*, and, but for the circumstance of its possessing ventrals, it might perhaps be ranged under that genus. It is, however, evidently a connecting link between the *Apodal Malacopterygians* and the *Blennidæ*.

Like the Blennies, this genus has neither cæcal appendages nor air-bladder. The intestinal canal is rather ample, with a few coils, but of tolerably equal dimensions throughout.

There is but one species of this new genus in the collection, which is from the Archipelago of Chiloe. The detailed description of it is as follows:—

ILUOCÆTES FIMBRIATUS. *Jen.*

PLATE XXIX. Fig. 2.

FORM.—Very much elongated, subcylindric anteriorly, compressed and ensiform behind. Greatest depth in the region of the pectorals, and about one-tenth of the entire length. Head, measured to the extreme point of the gill-cover, five and a half times in the same. The head is rather larger than any part of the body, its depth and thickness being equal, and each a trifle less than the depth of the body. Crown and forehead a little flattened, whence the profile descends in a curve before the eyes. Snout blunt and rounded, projecting, both in front and at the sides, beyond the lower jaw. Gape wide, and reaching to beneath the middle of the eye. Intermaxillary somewhat protractile at the sides, but not in front; shorter than the maxillary, with a considerable intervention of membrane between the extremities of the two bones, which are not united posteriorly, excepting by the membrane just mentioned. Maxillary long, rather slender, of nearly uniform breadth and thickness throughout, retiring in part beneath the suborbital, and reaching backwards to a vertical from the posterior part of the orbit. Intermaxillary with a single row of small, pointed, subconical, slightly curved teeth; in front of these, and quite at the anterior extremity of the jaw, two strong, hooked, regular canines;\* the teeth in the row rather wide asunder, and set a little irregularly, about thirty in number. In the lower jaw, teeth few in number, scarcely more than eight or ten in front, rather stronger than the intermaxillary series, followed by a moderate canine on each side, these last smaller than the ones above: at the sides of the lower jaw, beyond the canines, scarcely more than one or two small teeth (possibly others are fallen). A small cluster of three or four teeth on the fore part of the vomer, like those in front of the lower jaw, and a

\* One of these is gone in this specimen, but the socket in which it was implanted is obvious.



row on each palatine. Pharynx also armed with strong teeth; but the tongue, which is free at the tip, and rounded, smooth. Eyes large and prominent, and elevated rather above the line of the profile: their diameter one-fourth the length of the head; their distance from the end of the snout one diameter; the interocular space reduced to a narrow channel, and scarcely equalling half a diameter.

Opercle of a triangular form; subopercle lanceolate, projecting further than the opercle, and passing upwards and backwards to form the terminating angle of the gill-cover. Gill-opening of very moderate extent; the branchial membrane fastened down underneath, with five rays. Skin smooth and naked, loose, and probably very mucous in the living fish. Apparently no lateral line. The edges of both jaws curiously fringed each with a row of tubipores, or cutaneous appendages in the form of tubes, having pores at their terminal extremities for the exudation of mucus. The row on the upper jaw is continued along the margin of the suborbital on to the cheek; that on the lower is carried upwards to form an edging to the preopercle. There is also one of these tubipores at each nostril, another behind each eye, and a third on each side of the nape.

The dorsal commences above the terminating angle of the gill-cover, and extends the whole length of the body: its height nearly uniform throughout, equalling half the depth: the rays slender; all articulated, except the third, which is spinous, and shorter than those which precede and follow it; mostly simple, but some of the posterior ones slightly divided at their tips. Vent situate beneath the termination of the first quarter of the dorsal. The anal begins immediately behind it, and, like the dorsal, is carried on to the end of the body, to unite with it in forming a pointed caudal; all the rays soft and delicate. Pectorals rather pointed, with the middle rays longest, and about two-thirds the length of the head. Ventrals very minute and narrow, of only three rays, and appearing like one filament, about one-third the length of the pectorals; attached in front of the pectorals, and nearly in a line with the gill-opening.

B. 5; D. about 80; A. about 60; C. about 15; P. 16; V. 3.

Length 5 inc. 9 lin.

COLOUR.—Not noticed in the recent state. In spirits it is nearly colourless, with the exception of a dark bluish line along the base of the dorsal; upper part of the head, and nape, also stained with the same dark tint.

Habitat, Archipelago of Chiloe.

This species was taken by Mr. Darwin under stones. There is but one specimen in the collection, and it would be very desirable to see others, in order to ascertain whether the circumstance of the *third* dorsal ray *alone* being spinous, (those that precede as well as follow being articulated), is merely accidental in the one above described, or really characteristic of the species. If the latter, it is an anomaly,—a single spine thus occurring in the middle of a soft fin,—of which I know no other example.



GENUS.—PHUCOCÆTES.\* *Jen.*

*Corpus elongatum, compressum, nudum, alepidotum, porosissimum. Rostrum breve, obtusum. Dentes acuti, subconici, in maxillâ superiore uniseriati, in inferiore bi-vel tri-seriati; supra canini duo fortiores, antici, et præ serie exstantes: in vomere dentes duo vel tres acuti, quorum unus fortis; in utroque palatino uniseriati. Lingua lævis. Oculi parvi. Apertura branchialis arctissima, membranâ sex-radiatâ. Maxillarum margines poris conspicuis longitudinaliter dispositis, simplicibus, haud in tubos productis. Pinnæ ventrales, dorsalis et analis, ut in genere præcedenti.*

This genus differs from *Iluocætes*, in having the head and eyes smaller, the snout scarcely at all produced, the teeth in front of the lower jaw in two or three rows, and especially in the contracted gill-opening, which is reduced to a small hole, relatively not much larger than in the Eels, and in the branchial membrane having six rays. It wants also the tubal cutaneous appendages on the jaws and cheeks, in the place of which are rows of simple pores. It may be added that the whole skin is every where studded with pores; smaller, however, than those which form the maxillary series. The fins are similar, including the minute ventrals; but the tail and caudal are more rounded, and the membrane investing the rays of the dorsal and anal is more fleshy, so as hardly to allow of the rays being counted.

This genus is yet more eel-like, and more malacopterygian in general appearance than the last, serving to make the passage from the *Blennidæ* to the apodal division of the soft-finned fishes, still more gradual and evident. Mr. Darwin obtained it at the Falkland Islands. There is but one species in the collection referable to it.

PHUCOCÆTES LATITANS. *Jen.*

PLATE XXIX. Fig. 3.

FORM.—Still more elongated than the *Iluocætes fimbriatus*, but not tapering so much to a point posteriorly, the tail being blunter and more rounded. Greatest depth about one-eleventh of the entire length: head one-seventh. Head more compressed, its thickness being only three-fourths of its depth. Nape rather more elevated, and the profile more sloping, its descent commencing at a more backward point. Snout equally short and rounded, but much less projecting over the lower jaw. Gape, intermaxillary, and maxillary, similar: also the teeth; only the pair of canines above, standing in front of the series, are smaller; and below, the teeth in front are in two or more rows. On the fore part of the vomer is one strong tooth, and apparently one or two other smaller teeth with it; on each palatine a row, one or two of the anterior ones being stronger than the others. Eyes very much smaller; their diameter scarcely more than one-seventh the length of the head; not sufficiently high in the cheeks to cut the line of the profile: interocular space slightly convex.

\* Α φυκος fucus, et κοιτη cubile.



Pieces of the gill-cover on the whole similar, but the branchial aperture much smaller, the fissure not descending below the level of the upper part of the pectoral: branchial membrane with six rays. Skin quite naked, and thickly studded all over with mucous pores. Also some very large and conspicuous pores in rows on the jaws and cheeks, but not elevated into cutaneous tubes, excepting the nostrils, which are tubular.

Dorsal and anal with all the rays articulated, and the greater part of them simple, but some toward the tail a little branched at their tips. Caudal not so pointed as in *Iluocætes*. Pectorals and ventrals similar, but the latter a trifle longer and broader in proportion.

Length 4 inc. 7 lines.

COLOUR.—(*In spirits.*)—Brown, with the jaws, under part of the head, and lower half of the cheeks, whitish; also a whitish fascia extending longitudinally from behind each eye to the upper angle of the opercle.

A second specimen in the collection is smaller than the above, measuring only two inches and a half in length. It is in bad condition, but does not appear to differ, except in having the anterior canines above but very little developed.

Habitat, Falkland Islands.

Both individuals of this species were taken by Mr. Darwin in the Falkland Islands. "Caught amongst kelp."—D.



Pieces of the gill-cover on the whole similar, but the branchial aperture much smaller, the fissure not descending below the level of the upper part of the pectoral: branchial membrane with six rays. Skin quite naked, and thickly studded all over with mucous pores. Also some very large and conspicuous pores in rows on the jaws and cheeks, but not elevated into cutaneous tubes, excepting the nostrils, which are tubular.

Dorsal and anal with all the rays articulated, and the greater part of them simple, but some toward the tail a little branched at their tips. Caudal not so pointed as in *Iluocætes*. Pectorals and ventrals similar, but the latter a trifle longer and broader in proportion.

Length 4 inc. 7 lines.

COLOUR.—(*In spirits.*)—Brown, with the jaws, under part of the head, and lower half of the cheeks, whitish; also a whitish fascia extending longitudinally from behind each eye to the upper angle of the opercle.

A second specimen in the collection is smaller than the above, measuring only two inches and a half in length. It is in bad condition, but does not appear to differ, except in having the anterior canines above but very little developed.

Habitat, Falkland Islands.

Both individuals of this species were taken by Mr. Darwin in the Falkland Islands. "Caught amongst kelp."—D.



# ERRATA.

Page 6, line 2, from the bottom, for *versus apicem* read *apicem versus*.  
9, — 7, ————— for *versum angulum* read *angulum versus*.  
13, — 4, ————— for *ciliatis* read *ciliatæ*  
18, — 17, from the top, for *duobus* read *duabus*.



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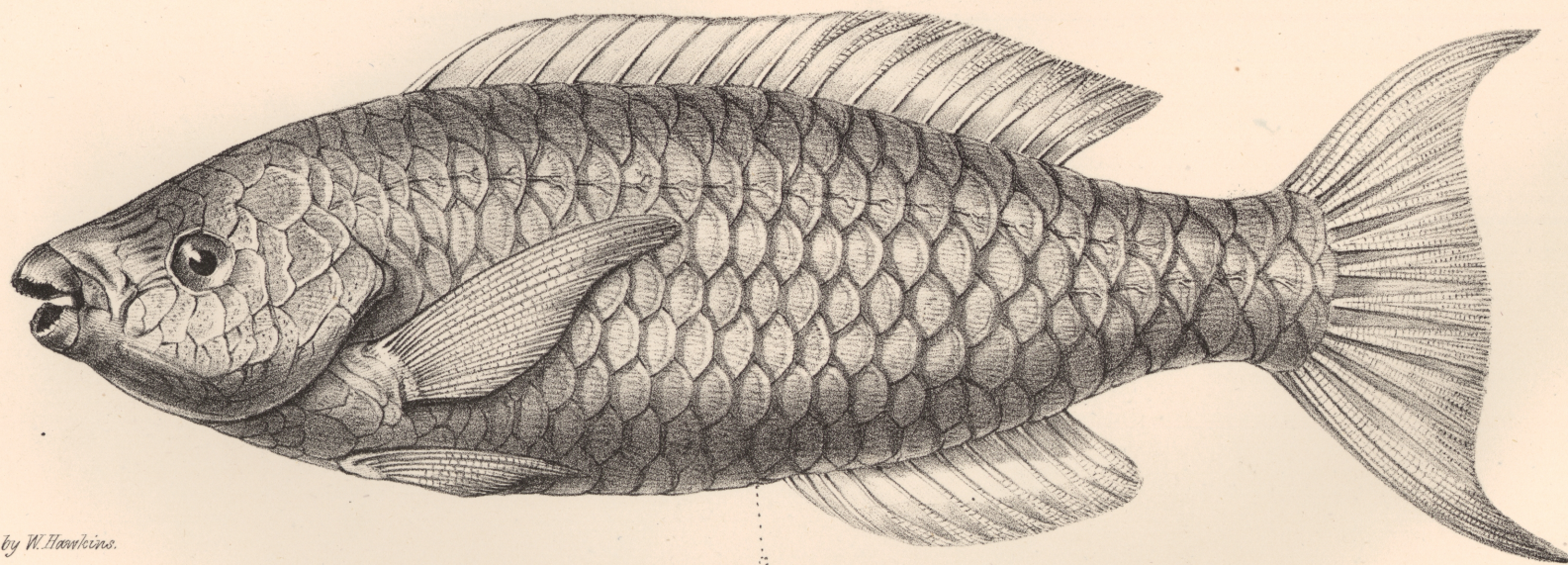


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*Lithog from Nature by W. Hawkins.*

*Scarus Chlorodon. ½ Nat. size.*

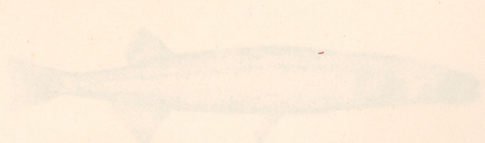
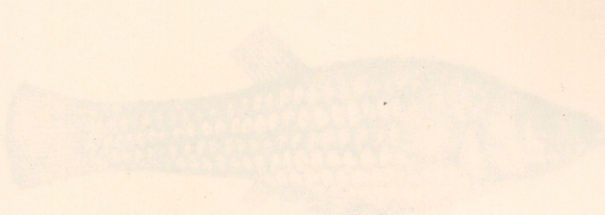












1. *Cichla decem-maculata* (Macleay) (New Guinea, New Caledonia)

2. *Lebias hexata* (Macleay) (New Guinea)

3. *Lebias nana* (Macleay) (New Guinea)

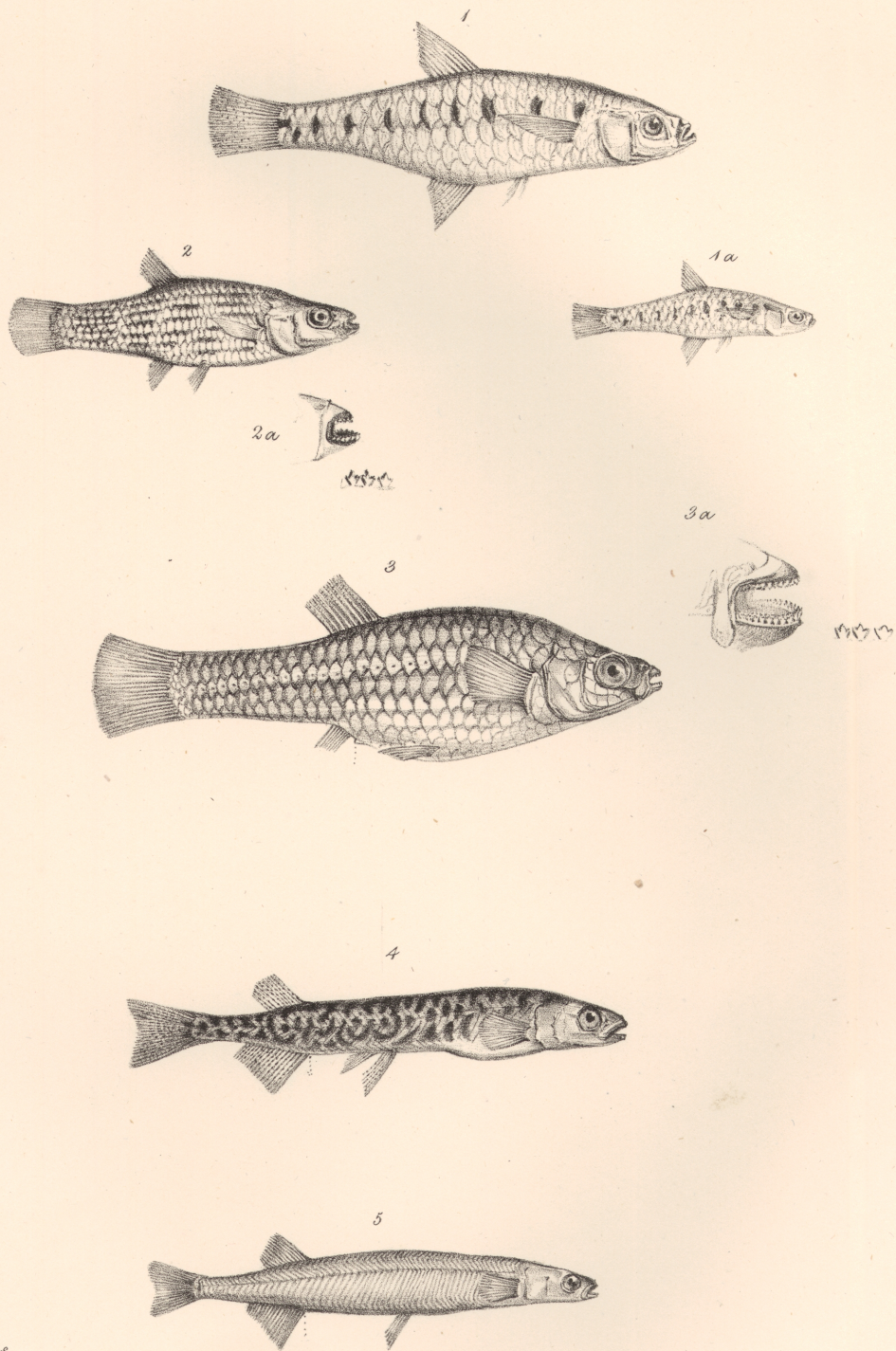
4. *Lebias nana* (Macleay) (New Guinea)

5. *Lebias nana* (Macleay) (New Guinea)

6. *Manicor maculatus* (Macleay) (New Guinea)

7. *Manicor attenuatus* (Macleay) (New Guinea)





From Nature on Stone by W. Hawkins.

N<sup>o</sup> 1. *Pecilia decem-maculata*. Magnified View twice Natural Size.

1a. .... Natural Size.

2. *Lebias lineata*. .... Nat. Size.

2a. .... Magnified View of Teeth

3. *Lebias multidentata*. .... Nat. Size.

3a. .... Magnified View of Teeth.

4. *Mesites maculatus*.  
5. .... *attenuatus*. } Nat. Size.





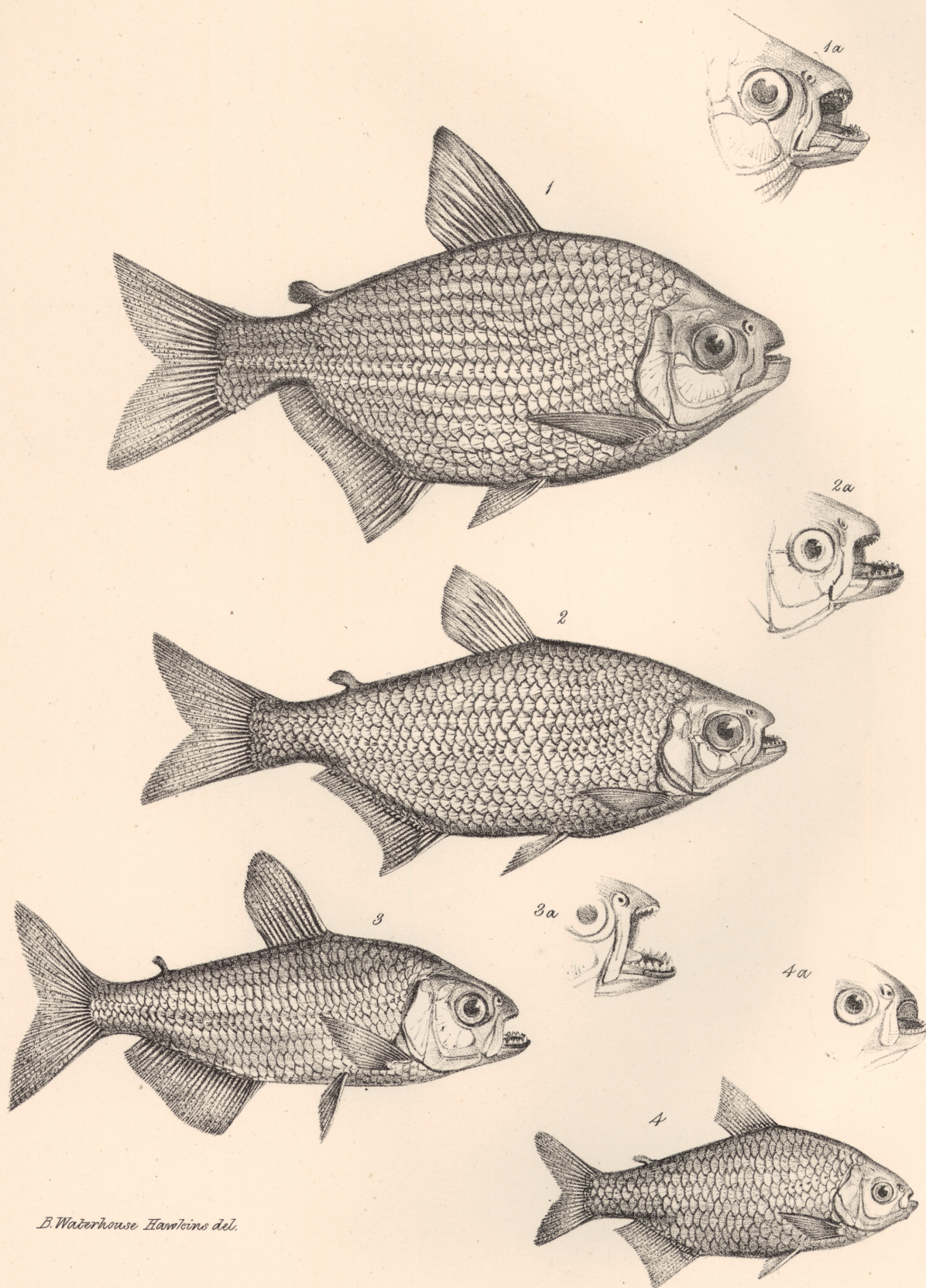












*N<sup>o</sup> 1. Tetragonopterus Abramis.*  
*2. .... rutilus.*  
*3. .... scabripinnis.*  
*4. .... interruptus.*

} *All Nat Size.*

*1a. 2a. 3a. 4a. Magnified View of Teeth.*



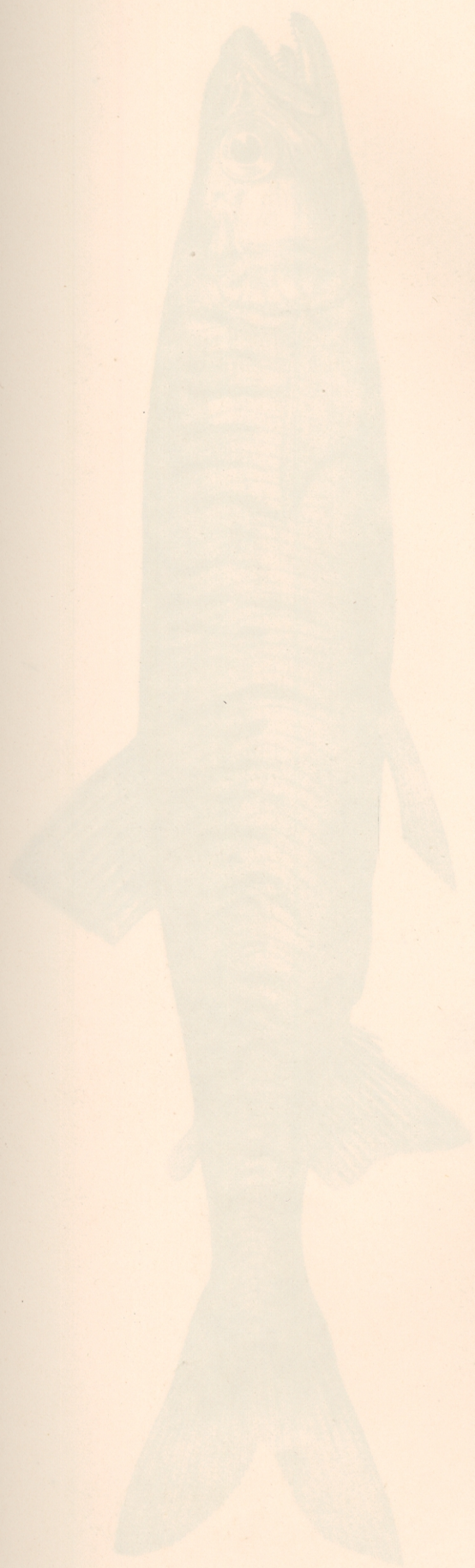


*Channa argus* (Forsk.)  
*C. asiatica* (Forsk.)  
*C. argus* (Forsk.)  
*C. asiatica* (Forsk.)  
*C. argus* (Forsk.)  
*C. asiatica* (Forsk.)  
*C. argus* (Forsk.)  
*C. asiatica* (Forsk.)



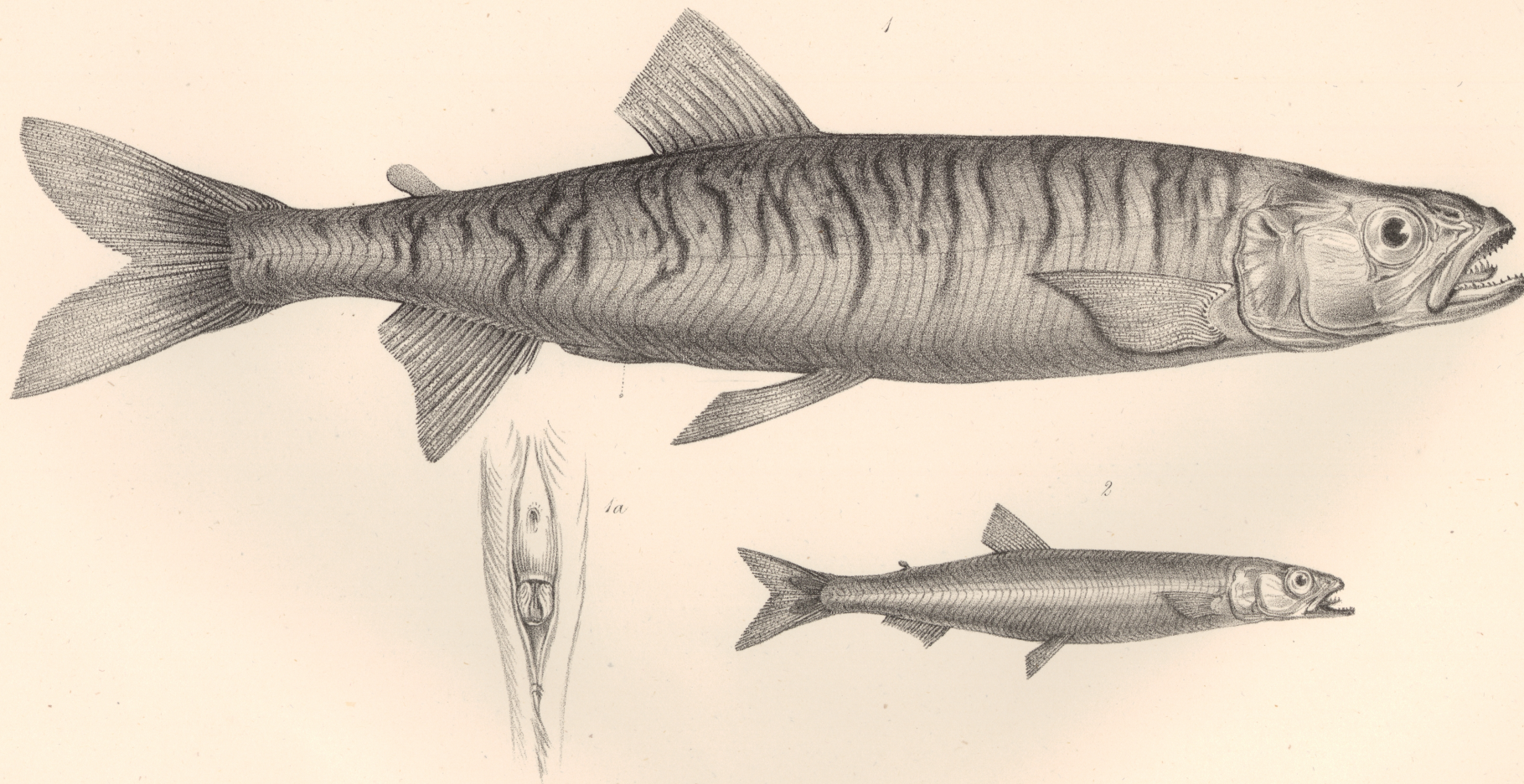






*Salmo salar*





*Waterhouse Harvies del.*

1. *Aplocheilichthys zebra*. Nat. Size.

1a. Magnified View of anal and generative orifices.

2. *Aplocheilichthys taeniatus*. Nat. Size.





*Parachanna* *Boettger*

- 1. *Parachanna nilotica*
- 2. *Parachanna aequatorialis*
- 3. *Parachanna victoriana*

1881

See the list of the species of the genus



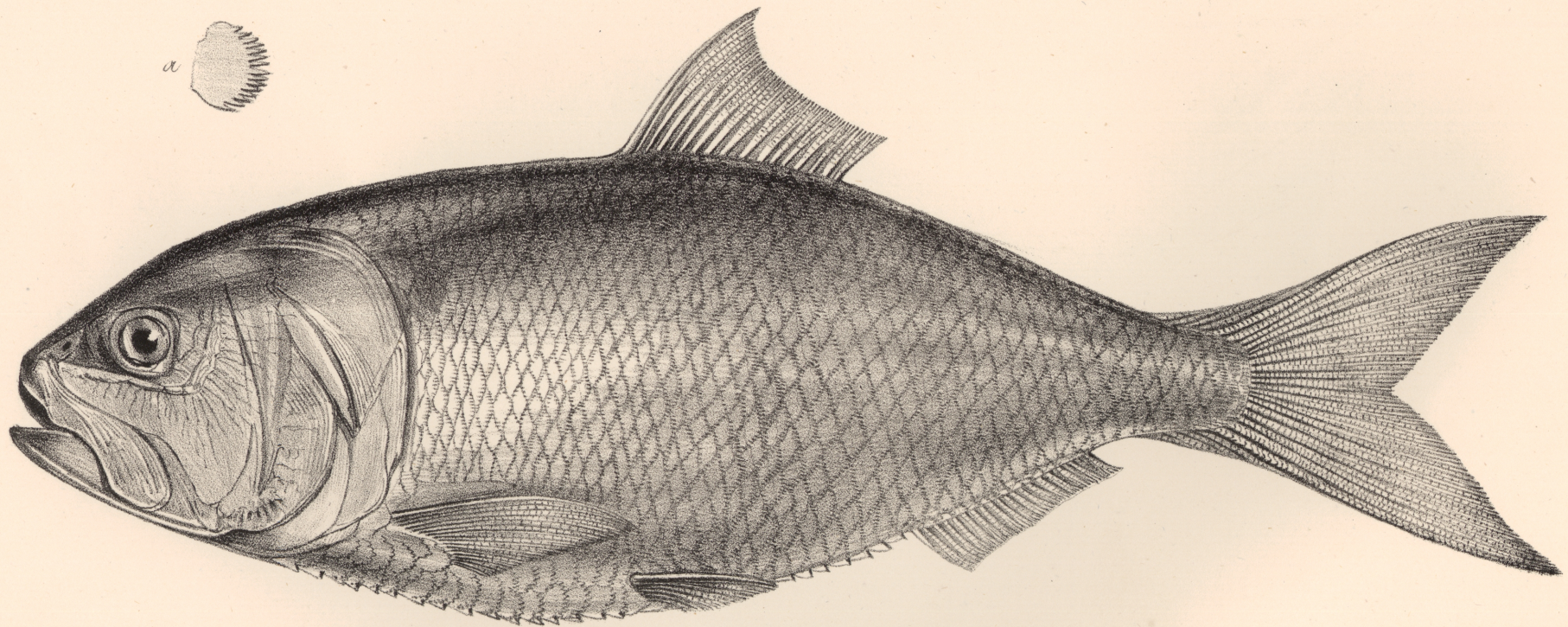






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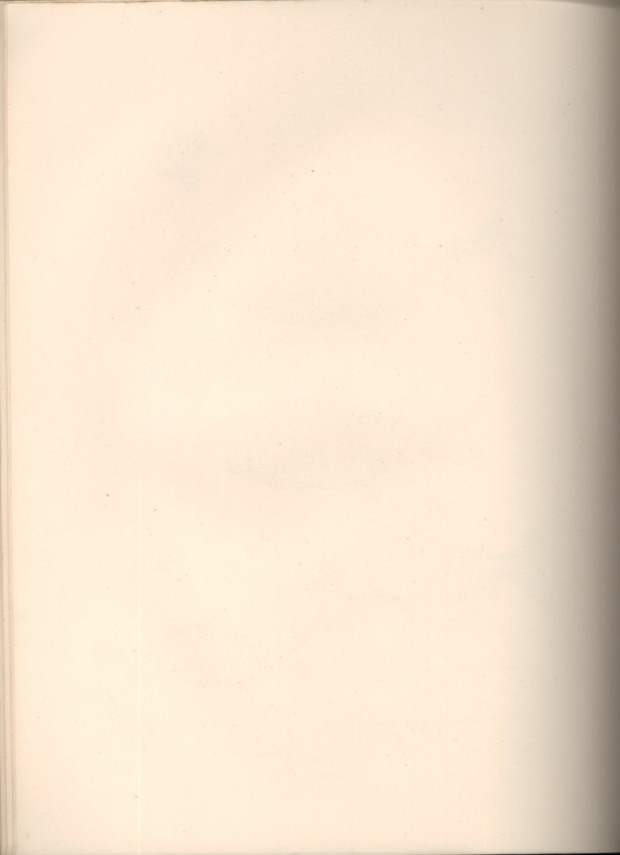




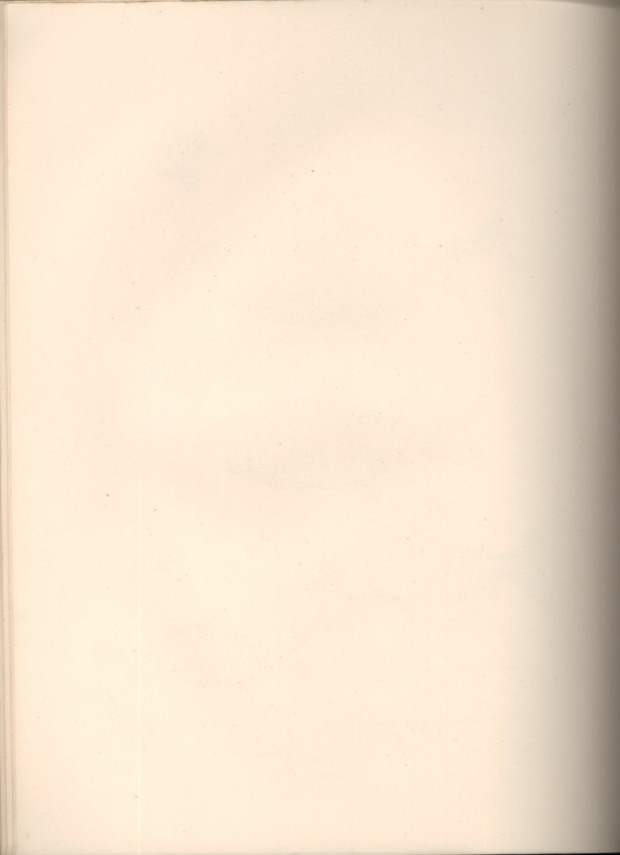
*From Nature on Stone by W. Hamilton.*

*Alosa pectinata.*  $\frac{3}{4}$  Nat. Size.  
*a.* Magnified Scale from nape.

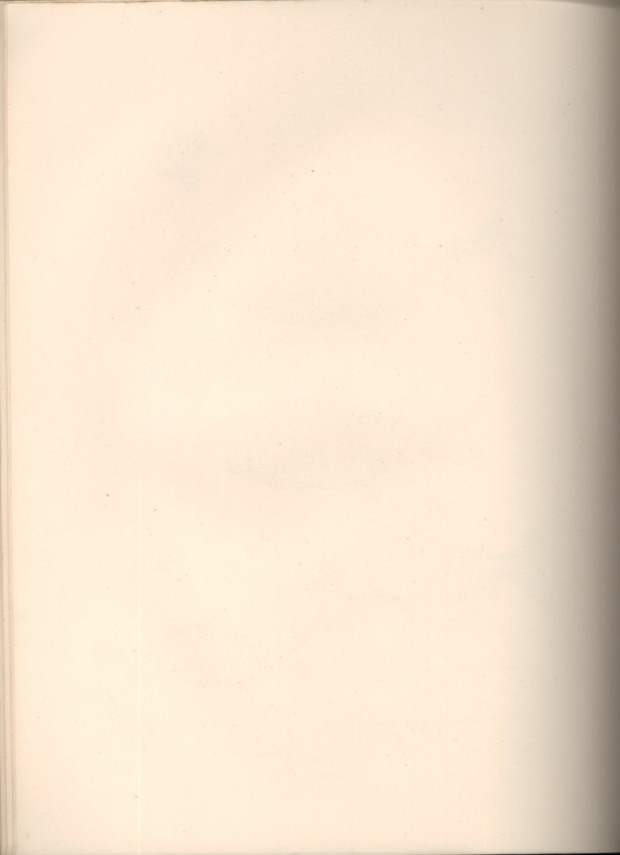




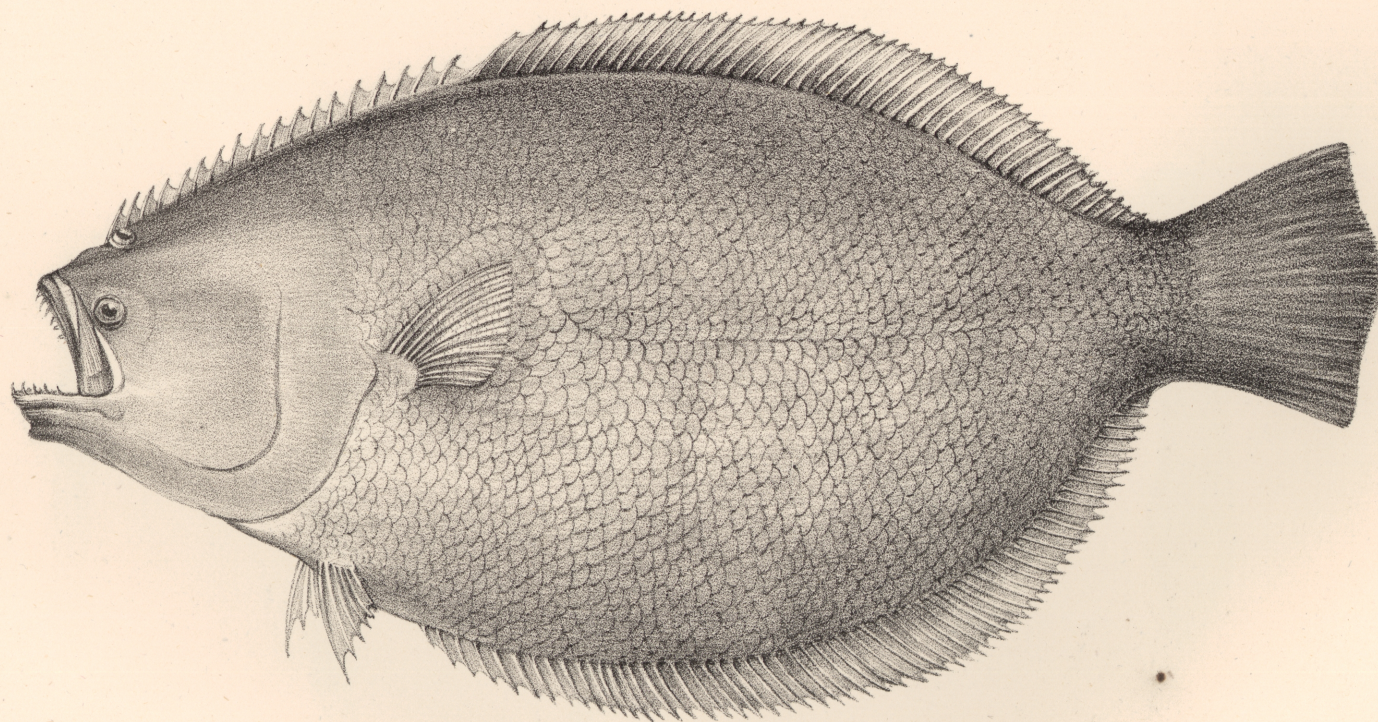












*Lithog. from Nature by W. Hawkins.*

*Hippoglossus Kingii.*





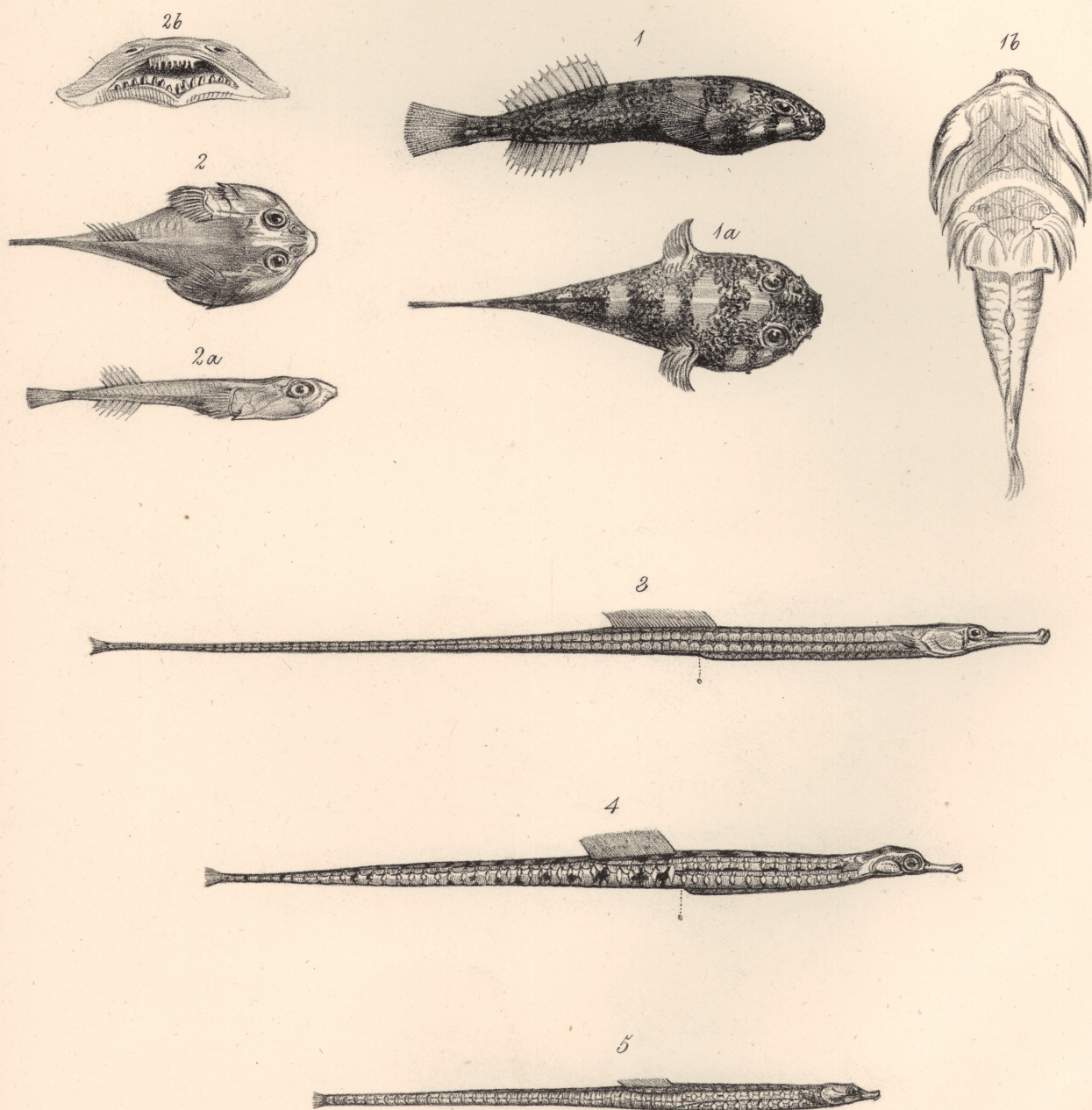












From Nature on Stone by W. Hawkins.

1. *Gobiesox marmoratus*.

2. *Gobiesox pæcilophthalmos*. 3. *Syngnathus acicularis*.

1a. " " Dorsal View.

2a. " " Lateral View.

4. " *conspicillatus*.

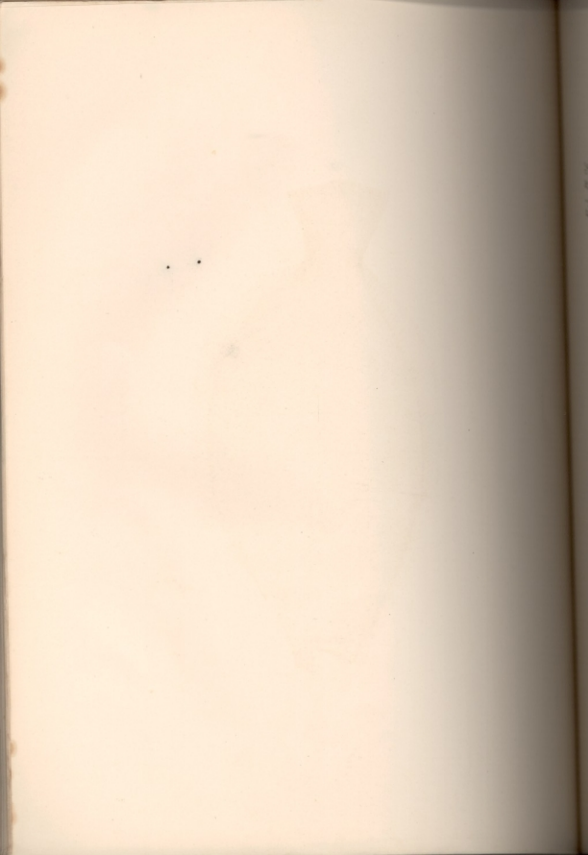
1b. " " Under Side.

2b. " " Magnified View of Teeth.

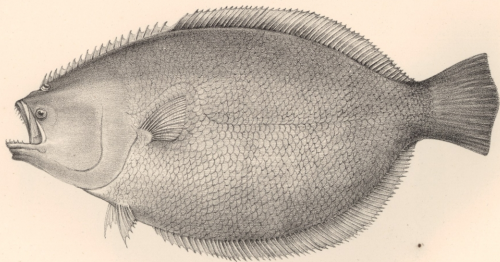
5. " *crinitus*.

All Nat. Size





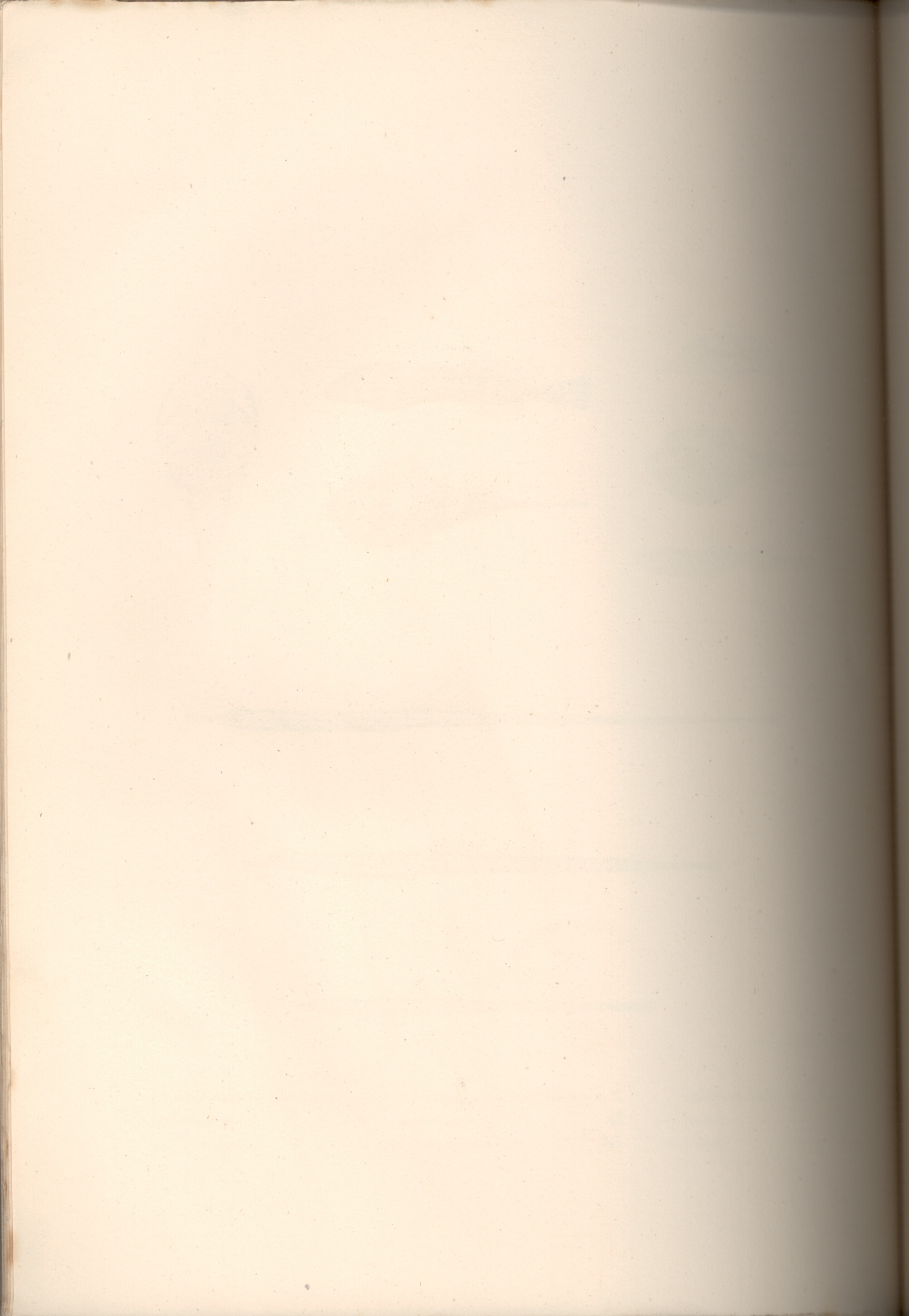




After a drawing by W. E. Wood.

*Hypoglossus Kingii.*









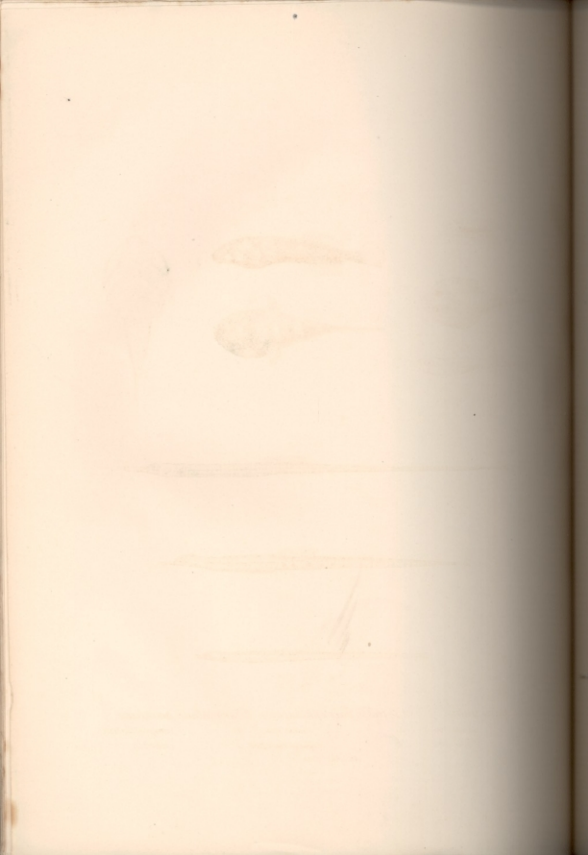
W. Hawkins del.

1. *Tetrodon angusticeps*.

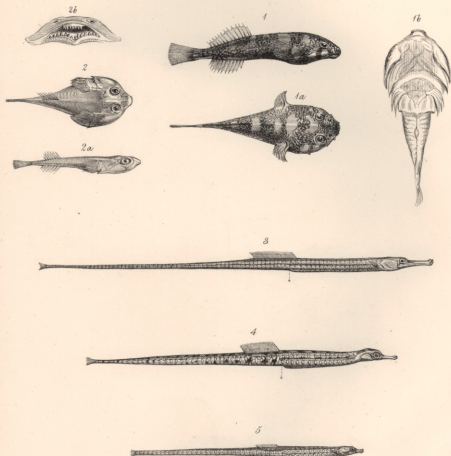
1a. .... Dorsal View.

Nat. Size.







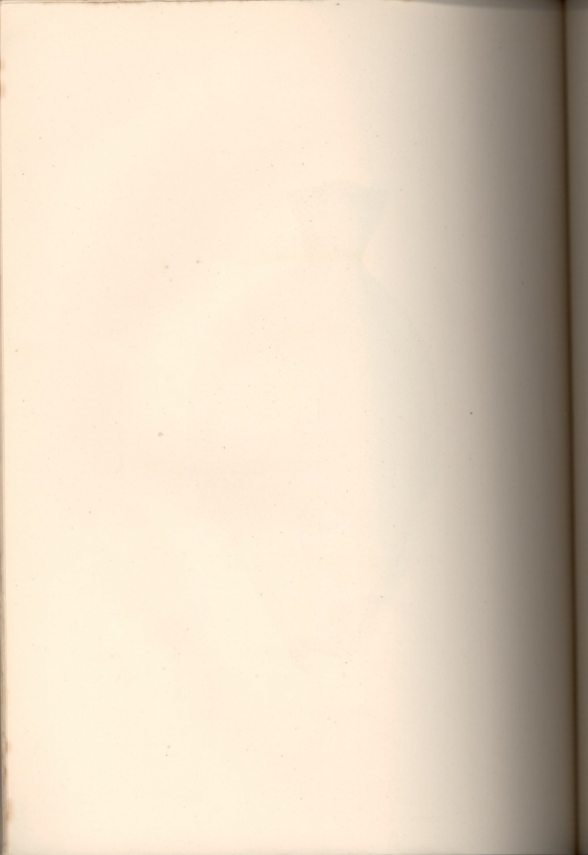


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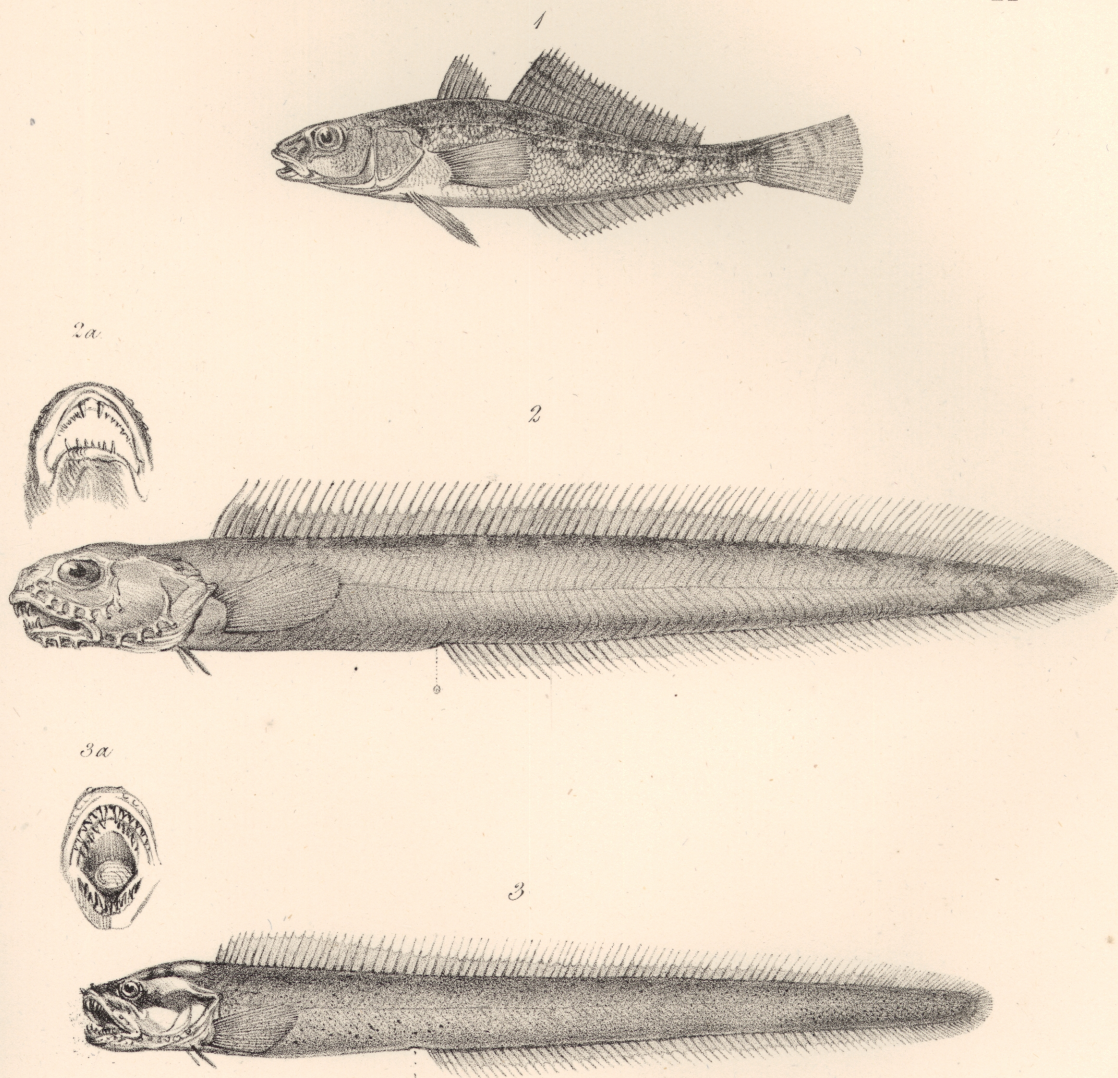
- |                                 |                                      |                                   |
|---------------------------------|--------------------------------------|-----------------------------------|
| 1. <i>Gobiesox marmoratus</i> . | 2. <i>Gobiesox paculephthalmos</i> . | 3. <i>Syngnathus acicularis</i> . |
| 1a. " " Dorsal View             | 2a. " " Lateral View                 | 4. " " <i>conspicillatus</i> .    |
| 1b. " " Under Side              | 2b. " " Magnified Head of Fish       | 5. " " <i>cnrilus</i> .           |

All Nat. Size





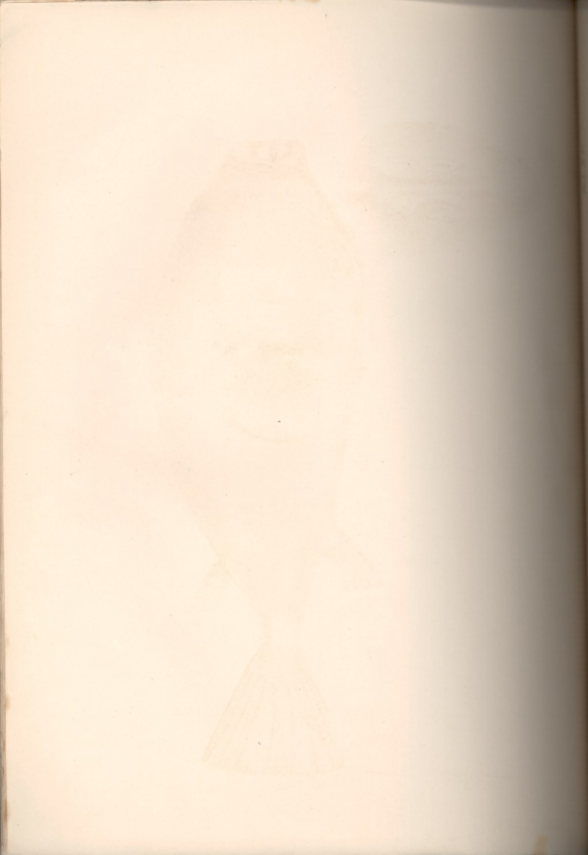




*Watsonhouse Hawkins del.*

- |                                 |              |
|---------------------------------|--------------|
| 1. <i>Aphritis undulatus.</i>   | } Nat. Size. |
| 2. <i>Pluocates fimbriatus.</i> |              |
| 2a. " Magnified View of Teeth.  |              |
| 3. <i>Phucocates latitans.</i>  |              |
| 3a. " " Teeth.                  |              |





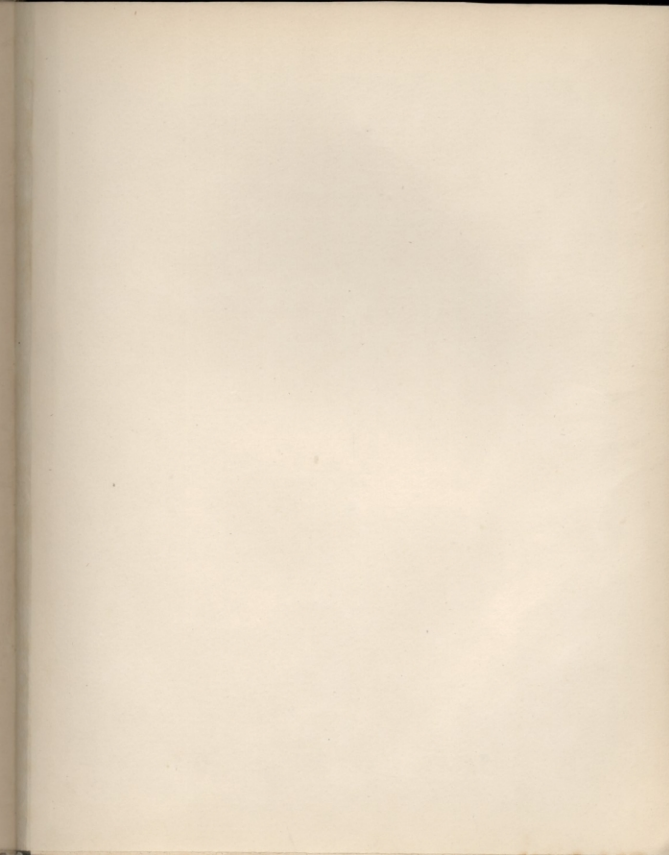














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