

GENERAL AND CRITICAL OBSERVATIONS

ON

THE FISHES OF TASMANIA;

WITH A

Classified Catalogue of all the known Species.

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GENERAL AND CRITICAL OBSERVATIONS ON THE FISHES OF TASMANIA.

IN submitting to the Fellows of this Society my observations upon the Fishes of Tasmania, I am especially reminded of the valuable labours of the late Mr. Morton Allport in this direction, and of the loss which Ichthyology has sustained by his untimely death. Not only had he laboured zealously and successfully in all matters relating to the acclimatisation of the European *Salmonidæ* and other fishes, but, in addition, he had at much pains during a number of years collected many of our indigenous fishes and forwarded them to Dr. Günther, of the British Museum, with his observations. A few of those forwarded by him were afterwards described by Dr. Günther as new to science, and a still larger number, although already known and described, were reported for the first time to include Tasmania in their distribution. In this way he materially extended our knowledge of the indigenous fishes, and so increased the known list from about 100 to 142 species. These were recorded by him in a MS. Catalogue, which the Council of this Society kindly placed at my disposal when they learned that I was independently engaged on a similar work. Unfortunately with respect to this Catalogue, there are no notes or observations of any kind regarding the fishes themselves; and if no other records exist, the greater part of the knowledge which he gained by his many years of patient study has been lost to science.

It is right that I should here also mention how much we are indebted to Mr. T. J. Lempriere, who was the first Tasmanian naturalist who formed an extensive collection of fishes. His collection was described by Dr. Richardson, and afterwards published in the *Journal of the Zoological Society* in the year 1839, and reprinted in the *Tasmanian Journal*, vol. I, p. 59-65; 99-108.

My own labours in connection with the fishes of Tasmania only extend over the last six years, but during that period I have devoted much of my time to their investigation. The branch of study which especially occupied my mind has been one that had already engaged my attention in respect of the land and fresh-water shells of this Island,—viz., habits and variability. Like some species of our land

shells, many of our fishes have been described from single specimens, or from individuals sent to Europe at various times more or less imperfectly preserved. The difficulties of dealing with the classification of certain species are great enough when the specimens available are abundant and perfect, but they are increased tenfold when the only specimens available for examination are both imperfect and few in number. The limits of variability must first be accurately determined before a satisfactory classification can be established in respect of closely allied species. It is not expected that the vexed subject of "what is a species" and "what is a variety" can be settled by the references made in this paper in respect of some of our fishes about which there is some doubt; but it is hoped that the observations carefully recorded by me may be helpful at least in basing the classification of some of our local species upon a wider and more secure foundation. As such, these observations are respectfully submitted for the consideration of those eminent in the science.

Of the 188 species known to exist in Tasmanian waters I have personally examined the general characters of about 145 species. Indeed, I have been in the habit of making drawings and recording particulars of all individual fishes which came into my possession, whether rare or common. Of the more common fishes I have recorded characteristic particulars of several hundred distinct individuals. I mention this for the purpose of showing that the opinions herein advanced by me in respect of matters related to classification are based upon the observations of many individuals of the same species taken in different seasons and in various stages of development. It is in this place also desirable to state that as a Member of the Royal Fisheries Commission, which has now almost completed its enquiries into all matters relating to Tasmanian Fish and Fisheries, I have been enabled to verify many observations of which I was formerly doubtful, and to extend my information with respect to the habits of the more common market fishes, and to matters relating to the fishing industry of this Island generally.

The great portion of our fishes were described from specimens collected by various naturalists who accompanied expeditions from Europe between the years 1834 and 1842.

The following are the names of authors who have determined the greater number of species known to exist in Tasmanian waters :—

Dr. Richardson	41	species.
Dr. Günther.....	32	ditto.
Cuvier & Val.	21	ditto.
Linnaeus	17	ditto.
Castelnau	10	ditto.
Johnston	10	ditto.
Various authors (25)	57	ditto.

TOTAL 188

In the Catalogue which follows the General Observations I have given reference specially to three distinct sources as regards fuller specific description or as an authority for the existence of the particular species in Tasmanian waters. These are—

1. Dr. Günther's Catalogue of Fishes, 8 vols., London, 1859-70.
2. Mr. Macleay's Descriptive Catalogue of the Fishes of Australia. Pros. Linn. Soc. New South Wales, vols. 5 and 6, 1881.
3. Mr. Morton Allport's MS. List of Tasmanian Fishes.

With respect to the last reference, I have to explain that although it consists of a mere list of names, it is a guarantee of the existence of the species in Tasmania, and it affords me the extreme gratification of having Mr. Allport's name associated with my own in the first attempt to give a systematic review of our Tasmanian Fishes.

That there are many imperfections may be expected, but I have endeavoured to make the list as complete as possible. Mr. Macleay's very useful Catalogue, to which I have referred, is very complete, and those who wish to study the Fishes of Australia will find it to be indispensable.

The following Chapters contain—

- 1st. A brief description of our Market Fish and Fisheries.
- 2nd. Observations upon the Freshwater Fishes, including a chapter on the Introduced Species.
- 3rd. Observations upon the Marine Fishes, in the order of the Families as arranged by Dr. Günther.
- 4th. A Classified Catalogue of all the known Species, with references to the sources where they are more fully described, and, in some cases, with critical notes and observations.

Market Fish and Fisheries.

With a population of only 120,000 persons, it cannot be expected that the fishing industry in Tasmania can be very extensive; nevertheless it is estimated that there are about 1050 persons directly dependent upon the capture and sale of Fishes.

Hobart is the chief centre of the industry, its position being particularly favourable in this respect from its nearness to the principal fishing-grounds. Fully 63 per cent. of the men and boats belong to Hobart; and the men carry on their business either in the upper or lower waters of the Derwent, or in the open sea Trumpeter reefs, 40 to 80 fathoms, lying between Seymour on the East Coast and Port Davey on the South-West. The marine fishing-grounds may generally be divided into three classes:—

I. The “Home Grounds,” near shore or in the upper shallows of estuaries, where the seine-net is largely used in the capture of—

The Sole *Amnotretis rostratus*.

The Flounder . . *Rhombsolea monopus*.

Garfish *Hemirhamphus intermedius*.

Mullet *Agonostoma Forsteri*.

In the Derwent, Tamar, Port Sorell, and George's Bay especially, there are many fishing-grounds where these fish are to be found in considerable numbers. Unfortunately, the flat fishes of Tasmania, and the Garfish, can only be captured by means of the seine-net, which in its operations destroys in myriads the young of all the fishes which tend to seek such shallow ground for food and shelter. Many unprotected localities, such as Ralph's Bay, in the Derwent, where such fish were once so abundant, have now been rendered almost barren from the indiscriminate and continuous operation of the destructive seine-net. The effect of the seine-net is clearly shown in the Derwent. The upper portion of the river, prior to being closed for the protection of the Salmonidæ, was so much thinned out by continuous and destructive seining, that the rod fishermen interested in the capture of mullet, native salmon, perch, &c. could no longer find it profitable to fish in this locality. Since this portion was so protected, all kinds of estuary fish have become so abundant, that it is stated that more mullet are caught now in these waters by amateur rod fishermen than were taken formerly by the seine-net.

The problem of devising some means whereby the Flounder, Garfish, and other useful marketable fish, might

be secured without involving the destruction of countless numbers of the ova and young of these and other fish, has yet to be solved. Certainly, limiting the size of the mesh of the seine might do some good, but it has been shown that the mesh which would allow the escape of the young Mullet, Perch, and Bastard Trumpeter, would still destroy the young of the Flounder. It is also shown that, owing to the mode in which the seine is used, the scraping of the lead-rope, and the enclosed weed render it almost impossible for the young fish to escape when the net is drawn upon the beach, even though the mesh of the seine were considerably enlarged. It seems, therefore, that the only way to remedy the evil is to reserve certain suitable areas in our estuaries as nursery grounds, wherein the use of the seine-net should be absolutely prohibited. The New South Wales Government have been obliged to adopt this course in respect of certain lakes and estuaries, in the interest of the deep-sea market fish, whose wholesale destruction was threatened by the operation of the seine-net.

II. The "MiddleGround" Fisheries are generally situated towards the mouth of estuaries, or in certain sheltered bays where the depth of water is from 5 to 6 fathoms. In such localities the graball net and ordinary hook and line are employed principally, in the capture of the following market fish:—

The Native Salmon	.....	<i>Arripis salar.</i>
The Bastard Trumpeter	....	<i>Latris Forsteri.</i>
The Black and Silver Perch		<i>Chilodactylus macropterus.</i>
The Magpie Perch	.....	<i>Chilodactylus gibbosus.</i>
The Carp	.....	<i>Chilodactylus Allporti.</i>
The Flathead	...	<i>Platycephalus bassensis.</i>
The Silver Trevally	.....	<i>Caranx Georgianus.</i>
The Snotgall Trevally	...	<i>Neptonemus brama.</i>
The Rock Cod	.....	<i>Pseudophycis barbatus.</i>
The Ling	.....	<i>Genypterus blacodes.</i>
The Sand Mullet	.....	<i>Mugil dobula.</i>
The Conger Eel	.....	<i>Conger vulgaris.</i>

III. The "Outer," or "Open Sea" fishing-grounds, lie principally in the Southern waters of Tasmania, from one to sixteen miles off the coast, in depth of water ranging from 20 to 80 fathoms.

The fishing-boats employed in these grounds are necessarily the best of their description, although the most of them are open whale-boats, fitted, as nearly all of our Hobart fishing-boats are, with wells for keeping the fish alive after capture.

The fish, bottom fish, caught by hook and line in such places are

The School and Old-man

Trumpeter *Latris hecateia*.

The Rock Gurnet *Sebastes percoides*.

The Black and Silver Perch *Chilodactylus macropterus*.

The Real Bastard Trumpeter *Mendosoma Allporti*.

Towards the surface of these open waters, the Maori "jig" and the swivelled barbless hook are employed in the capture of the rapacious though important market fishes—

The Barracouta *Thyrsites atun*.

The Kingfish *Thyrsites solandri*.

Altogether, it is estimated that out of the 188 known species of fish, there are about 63, or a third, good edible fish,—but only about 21 of these are sufficiently abundant to be considered as of any importance, so far as a regular market supply is concerned.

Large schools of sprats and anchovies are known to appear upon our coasts regularly, but there are neither establishments* amongst us for the preservation of such fishes, nor have we the suitable equipment, in the shape of nets, for their capture. In time this source of wealth may be opened to us. At present, want of knowledge, and possibly want of enterprise, operates against this valuable source of supply.

Trawl-nets have been tried on our coasts, but without good result. Either the class of bottom fish are absent in our waters, or the proper grounds have yet to be discovered suited for this mode of capture.

Freshwater Fishes.

Our Freshwater fishes,—and among these I include migratory species which necessarily live a portion of their existence in fresh water,—may with convenience be dealt with specially, and they naturally fall into two distinct groups; viz.—

1. The Indigenous Fishes.

2. The Introduced Fishes from Europe.

Among the former there are 15 species, belonging to eight distinct families and 11 genera; viz.—

* Mr. Peacock, of Hobart, had tried to establish a preserving industry, but gave it up because he had not the skilled labour nor the proper facilities for carrying on the business successfully.

	Family.	Genus.	Species.	Common to Australia.	Common to N. Zealand.
1	Percidæ	Lates	colonorum	•	
2	"	Microperca	Tasmaniæ		
3	Triglidæ	Aphritis	Urvillii		
4	Gadopsidæ	Gadopsis	marmoratus	*	
5	Haplochitonidæ	Haplochiton	Sealii		
6	"	Prototroctes	maræna	*	
7	Salmonidæ	Retropinna	Richardsoni	*	*
8	Galaxidæ	Galaxias	truttaceus		
9	"	"	attenuatus		*
10	"	"	auratus		
11	"	"	Weedoni		
12	"	"	Atkinsoni		
13	Murænidæ	Anguilla	australis	*	
14	Petromyzontidæ	Mordacia	mordax	*	
15	"	Geotria	Allporti		

The most important among these, so far as the market is concerned, are—

1. *Lates colonorum* Brackish-water Perch.
2. *Gadopsis marmoratus* .. Blackfish.
3. *Anguilla Australis* The Common Eel.
4. *Prototroctes maræna* .. The Freshwater Herring.
5. *Retropinna Richardsoni*. The Smelt or Whitebait.
6. The various species of { Jolly-tails and Native
 Galaxias. Trout.

The first three are the only fish attaining any size ; the remainder are small, valued for their quality as food, and in most cases for their wonderful abundance throughout nearly all the rivers and streamlets of Tasmania.

Lates colonorum.—Is a well known fish in Australian waters, but its distribution in Tasmania is confined, so far as is yet known, to one small river discharging into Anson's Lagoon, in the north-east part of Tasmania. It has more the appearance of a saltwater fish, and indeed, although it is not a sea-going fish, it is most frequently captured in brackish water at the mouth of small streams whose connection with the sea is frequently closed with shifting sand-bars. It is probably in this way that this genus had originally become acclimatized to the fresh water. The existence of this fish in Tasmania was only recently made known to the Society through the instrumentality of Mr. John Swan, who states in respect of it, that he had seen, about the end of June, 30 or 40 specimens in the course of two days, weighing from $1\frac{1}{2}$ to 3 lbs. each, which were netted by Chinamen. Their stomachs were filled with small fish, which he stated resembled anchovies. The Chinamen cut a slit down the back of the fish, and put

them into a composition which they keep secret ; they then hang and dry them, without removing the intestines. A specimen preserved in this way, now in my possession for more than a year, is still in an excellent state of preservation.

The market for the fish captured by the Chinamen is chiefly among the tin-miners of Thomas's Plains.

It is most singular that this species, with the Blackfish (*Gadopsis marmoratus*), should be identical with species found abundantly in Victorian Rivers, and wholly absent in all the southern waters of Tasmania. The Unio (*U. moretonicus*), and the Freshwater Lobster (*Astacopsis Franklinii*), are also restricted to the rivers which discharge their waters into Bass's Straits. The peculiar inhabitants of northern rivers, therefore, are more Victorian than South Tasmanian in character, which is remarkable when we consider the present insular character of Tasmania. Mr. Wallace's theory of the original distribution of 'Island Life' receives ample confirmation from these and other facts known to me in connection with the Flora and Fauna of Tasmania.

The Blackfish (*Gadopsis marmoratus*), whose singular distribution has been commented upon, is found in nearly all the rivers of Tasmania which flow into Bass's Straits. Their original absence in some northern streams, such as the South Esk,—which has recently been successfully stocked by Mr. Harrison and other pisciculturists,—is somewhat puzzling ; but the total absence from all the other rivers and streams of Tasmania where the conditions are identical, can only be explained on the principles of geographical distribution as illustrated by Darwin and Wallace. I believe if the Fauna of Tasmania were specially studied by Mr. Wallace, that many of the opinions advanced by him in his last great work would receive ample and striking confirmation.

The Blackfish somewhat resembles a small Ling in markings and general appearance. It is much esteemed as food, and is a welcome fare to bushmen and settlers who are far removed from the centres of population. The fish usually are taken in considerable numbers by rod and line all the year round, the hook baited often with the large white grub (a species of moth obtained from the 'wattle' or 'honeysuckle,' (i.e., *Acacia dealbata* : *Banksia marginata*). A good take can always be relied upon in most of the northern streams, especially in the Ringarooma, where, it is stated by Mr. John Brown, they have been known to reach a

weight of 10 lbs. The average weight, however, runs from 3 to 4 lbs., except in the North Esk, where they run smaller than elsewhere. Mr. Brown and others who have observed our freshwater fishes closely, assert that they cannot distinguish the male from the female, although they have purposely opened hundreds of them. I have opened a good number myself, but at the time I did not know of this fact, and naturally supposed that they were ordinary females. I am inclined now to consider that they are bisexual, and will take the first opportunity to enquire into this matter more fully. Unfortunately, the specimens in my collection have the intestines removed. Blackfish are sometimes taken in the brackish water of tidal rivers.

Anguilla Australis, the Common Eel of Australia and Tasmania, is very abundant in all our rivers. Large numbers are caught in the Tamar and its principal tributaries, the North and South Esk. Some of the eels have been taken in the Ringarooma and South Esk Rivers over 30 lbs. in weight, and over 20 inches in girth. The market supply could be greatly extended if there were any demand for them.

Prototroctes marana, the Freshwater Herring, or Cucumber Fish, although rarely exceeding $\frac{3}{4}$ lbs. weight, and 12 inches long, is perhaps the finest of our native freshwater fishes. It has an adipose fin, and is closely allied to the true Salmonoids of European waters. It is to a certain extent migratory; but whether it approaches the lower reaches of the streams to spawn in suitable redds, or whether it is necessary to approach the brackish water for some other reason, is not yet quite clear. They are stated by Mr. Brown to have been found in brackish water in the Tamar a considerable distance below the confluence of the North and South Esk Rivers. They are a clean cut, handsome shaped fish, with small head and elongate body, like a diminutive salmon. They are chiefly insect feeders, and during the season they at one time could be caught in vast numbers in nearly all our rivers. Although in many of our streams they appear to be again on the increase, it is remarkable that about 14 years ago they suddenly almost disappeared from most of our rivers where they were formerly plentiful. The general conclusion is that this disappearance of the herring was due to a wide spread epidemic. In some places it is stated that thousands of dead fish were seen floating down the rivers. The fins, eyes, and gill-covers appeared to be covered with a fungus. It is therefore likely that at particular periods they are subject to the widespread attack of some species of *Saprolegnia*,

similar to that which attacks the *Salmo salar* of Scotch and English Rivers, as described by Professor Huxley. They are caught chiefly with rod and line,—a fly-hook baited with a “gentle” seems to be the mode of capture in greatest favour among sportsmen.

Retropinna Richardsoni, the Smelt of New Zealand, is also found in the various estuaries of Tasmania at certain periods of the year. It scarcely exceeds 3 to 4 inches long, and is usually found in myriads in the shrimp-nets, together with the silver-belly Sand-smelt (*Atherina*, *sp.*), the Jolly-tail (*Galaxias attenuatus*), and the Anchovy. The Jolly-tails, Sand-smelts, and Smelts are frequently termed ‘Whitebait,’ and are esteemed a great delicacy for the table. In the Tamar all these little fishes may be caught in vast numbers. Dr. Günther formerly supposed that *R. Richardsoni* was confined to New Zealand, but it is now known to be common to Australia and Tasmania also.

The various species of Native Trout (*Galaxias*) are more numerous, and are found more widely spread than any other freshwater fish in Tasmania. *G. auratus*, the Golden Lake Trout, is found at an altitude of nearly 4000 feet, while *G. attenuatus* is generally found at the lower levels, and are most abundant not far away from the influence of brackish water, which they freely enter. *G. truttaceus*, the Spotted Trout, is found in the inland streams; a variety ascends the mountain rivulets, and hence it is termed the Mountain Trout. They are all small fishes, with rounded scaleless bodies and flattened heads. The Golden Lake Trout (*G. auratus*) is the largest. Specimens of this fish, which is most closely allied to *G. truttaceus*, are in my possession measuring 11 inches long.

The Lamprey, though abundant in some rivers, seems not to be in favour in the market, as they are rarely seen there.

INTRODUCED FISHES SUCCESSFULLY ACCLIMATIZED IN TASMANIAN WATERS.

It is no small credit to Tasmania that she is the first Colony in the Antipodes which has succeeded in the remarkable achievement of stocking her waters with European fishes, from eggs hatched in her establishment at New Norfolk, on the Plenty, which were originally taken from the parent fish and artificially impregnated in England. The history of the Salmon experiment of Tasmania is now

a famous one, and need not be enlarged upon here. It is necessary, however, that a brief reference should be made to it, and to the fishes now successfully established in our waters, and included among the Catalogue of Tasmanian Fishes. It is now nearly 33 years ago since Sir W. Denison, Mr. Burnett, Capt. Stanley, Mr. A. Young, and others, originated the idea of stocking Tasmanian rivers with the Salmon of Europe. Many trials and proposals were made, and repeated failures; but these experiments were in one sense a success, for they eventually led the minds of such men as Gottlieb Boccus and Mr. J. A. Youl, C.M.G., to ponder over and eventually to overcome all obstacles and difficulties. For, although the shipments of 50,000 ova in each of the years 1852, 1859, and 1862, by the *Columbus*, *S. Curling*, and *Beautiful Star* failed altogether, yet, mainly owing to the enthusiastic ardour and intelligent direction of Mr. Youl, in conjunction with English and Tasmanian naturalists, success at last crowned their labours by the safe arrival of the *Norfolk*, in the year 1864, with healthy impregnated ova, packed in moss, and surrounded by ice, in a suitable chamber.

Mr. Seager, the Secretary of the Tasmanian Salmon Commissioners, has kindly given me the following particulars. Of the 102,000 ova of *Salmo salar*, and 1500 eggs of *Salmo fario* (Itcham Trout), it is estimated that about 34,700 of the former and 300 of the latter arrived at the Salmon Ponds on the Plenty in a healthy condition; and of these it is further estimated that 3000 of *Salmo salar* and 300 *S. fario* were successfully hatched and eventually liberated in the Plenty. In 1866 another consignment of about 102,000 ova of *S. salar* and 15,000 of *S. trutta* arrived, from which about 6000 of the former and 496 of the latter were successfully hatched, and eventually liberated in the same tributary of the Derwent. The result of this has been that the River Derwent is now stocked with the migratory sea-going Salmonoids and the Brown Trout; while in all the principal rivers of the island the Brown Trout has been successfully established. Indeed, it is noteworthy that the Brown Trout hatched in the Ponds from a box of ova supplied by Frank Buckland and Francis Francis, are the progenitors of all the Trout which now exist in the Australian Colonies.

The following is a statement, also supplied by Mr. Seager, of the ova and fry forwarded to the various places between the years 1869 and 1881 from the breeding establishment on the Plenty; viz.—

	<i>Fry.</i>	<i>Ova.</i>
To rivers and streams through-		
out Tasmania	57,190	36,600
Victoria .....	..	81,500
New South Wales .....	..	21,500
South Australia .....	..	20,000
Western Australia .....	..	800
New Zealand .....	..	18,850
TOTAL	57,190	179,250

For a fuller account of the Salmon experiment I have only to refer to the many interesting papers contained in the Proceedings of this Society contributed by the late Mr. Morton Allport, to whom also the success of the experiment in Tasmania is in a large measure due.

The ova were obtained originally from the following streams in England and Scotland—

Salmo salar—Ribble and Hodder, Lancashire.
 Severn, Worcestershire.
 Dovey, Wales.
 Tyne, Northumberland.
 Tweed, Scotland.

Salmo trutta—Tweed, Scotland.

Salmo fario—Itcham and its tributaries, near Southampton.

Among those gentlemen who rendered their valuable aid in procuring ova, and in forwarding the success of the various experiments, may be mentioned the following:—Mr. Frank Buckland, Mr. Brady, Mr. Francis Francis, Mr. Ramsbottom (father and son), W. Allies, and Mr. Johnston. In Tasmania we have associated with Mr. Allport the following gentlemen who have specially taken an interest in the introduction of the Salmonidæ from the first, viz.:—Sir Robert Officer, Dr. Milligan, Mr. John Buckland, Dr. Agnew, Mr. Curzon Allport, and Mr. Robt. Read, upon whose estate the Salmon Ponds have been constructed.

Besides the acclimatization of three species of Salmon, to Mr. Morton Allport is mainly due the successful introduction to our waters of the following well known European fishes:—

The River Perch *Perca fluviatilis*.
 The Common Tench *Tinca vulgaris*.
 The Crucian Carp *Carassius vulgaris*.
 The Golden Carp *Carassius auratus*.

These are to be found in our various rivers, and are so well known that they need no description. Victorian and New Zealand Rivers have been successfully stocked from Tasmania with the River Perch, the Tench, and the Crucian Carp.

Of these latter the Tench is the only fish of importance which has become really abundant in Tasmania. The Perch seems to thrive well in certain lakes where introduced, but not to the same extent as the Tench.

With respect to the exact nature of the Derwent migratory Salmonoids, there has been much discussion as to whether the *Salmo salar* has really established itself or not. The handsome fish which is now so numerous in the estuary of the Derwent is within certain limits a most variable form, —some individuals being almost identical in all specific characters with the grilse form of *S. salar*, while others partake more of the character of the equally valuable *S. trutta* and its still more closely allied congener, *S. Cambricus*. It is clear to me, however, that the prevailing form found in salt water is a mean between these, and it is this overlapping of the closely agreeing characteristics of these so-called species which renders it so puzzling to determine to which of them any one individual belongs. The question, which has excited much interest in Tasmania, is confused by the notions of imperfectly informed persons, who, by the use of such a misleading common name as 'Bull Trout,' have led many to think that we have only succeeded in acclimatizing the common Brown Trout and its varieties in our waters, and they often, in ignorance, speak of our fine migratory fish as if it were a coarse, destructive fish of no value. It is to be regretted, where legislation may be concerned, that erroneous notions should be circulated in this way. By such people the fanciful views of amateur pisciculturists or sportsmen are deemed to be of equal value to the utterances of learned ichthyologists such as Dr. Günther, whose profound knowledge forces them to speak with extreme caution.

We only know as yet that we have a fine non-migratory Trout (the Brown Trout), and a splendid sea-going migratory Salmonoid. The question is, not *S. fario* versus *S. trutta*, or *S. fario* versus *S. salar*, but the more difficult one of determining whether the variable, handsome, migratory fish, which is frequently captured far out at sea, is (1) *S. trutta*, (2) *S. Cambricus*, (3) *S. brachypoma*, (4) *S. salar*, (5) all of these in variable numbers, (6) a hybrid partaking in varying degrees of the characters of the four

named species, or (7) one or other of those named but modified by transfer to a new environment. If the individuals which prevail agreed with or fell within the classified limits of any one species we would not have the slightest difficulty in determining their specific value; but when no one individual comes exactly within the limits of the written characters, it is necessary that the seven propositions advanced by me should be answered satisfactorily before any one can pronounce with confidence on the subject.

Mr. Allport, who knew very well the niceties of distinction between *S. salar* and *S. trutta*, inclined strongly to the opinion that our Derwent Salmonoids are grilse of the former, and not *S. trutta*. Dr. Günther and Professor M'Coy have had the disadvantage of determining the nature of the species from single individuals sent to them at odd times. They consequently, from such disconnected points, could have no means of determining the curve of variability, and I am not surprised therefore that, respectively, at different times, they have pronounced certain individuals to be *S. salar*, *S. trutta*, *S. Cambricus*, and a hybrid between *S. salar* and *S. trutta*. Odd specimens cannot determine the curve of variability, nor can they determine whether the four fish, so differently named, were not after all the progeny of the same parents.

The following are curious facts. A Brown Trout, caught in the Mersey, with a coarse head, weighing $22\frac{1}{2}$ lbs., girth 24 inches, contained 7 lbs. of very large mature ova. Each ovum was of a pale straw colour, with a conspicuous pinkish nucleus. The colour of the pinkish nucleus gave a decidedly pinkish tinge to the ova in mass. The pectoral fin of this fish had 16 distinct rays.

A short, but silvery variety of Brown Trout, which frequents the wharves in brackish water at Launceston, weighing about 5 lbs., has pinkish flesh, and well-developed pyloric appendages. In one individual I counted as many as 72, all of them larger than the average size. A fish of similar habit, called by some "White Trout," is found, common, in brackish water at Bridgewater. The latter, however, is generally more elongate, and individuals have been captured over $22\frac{1}{2}$ lbs. in weight.

A handsome migratory Salmonoid, caught recently below Bridgewater, weight 9 lbs., total length 28 inches. In colour, form of body and tail, shape of caudal and other notable characters, it agreed with the characteristics of *S. salar*; yet in the tail series of transverse scales, certain characters of

the operculæ, the slightly obtuse snout, and in the relatively long maxillaries, were more in accord with the characteristics of *S. trutta*. The shape and number of pyloric cæca were within the overlapping number common to both.

It is begging the whole question to assume hybridism when the prevailing type is similarly variable, unless we assume also that the ova of one species were artificially impregnated by the semen of the other by mistake prior to dispatch from England. This is conceivable ; but when we consider the names of those who carefully selected the fish in England which were stripped, it is not at all probable. Besides, the theory of hybridism is to me extremely unsatisfactory. It assumes that we know the exact measure of the external influence of varying light, food, and the local nature of the medium in which these animals exist. The extraordinary facilities for intercrossing among fishes naturally must also be taken into consideration, together with the fact that the extremes of each type steadily perpetuate themselves in European waters.

As directly bearing upon this subject, it is noteworthy that already in New Zealand and Tasmania the allied non-migratory species, *S. fario*, var. *Ausonii*, has developed into distinct types, which are peculiarly characteristic of particular streams. This clearly shows that differences of this kind are not sufficiently fixed to remain unaffected by environment,—that they are in fact *racial* and subordinate to influences of immediate environment, and not fixed or specific, and remaining constant in spite of such accidental influences.

Marine Fishes.

BERYCIDÆ.

There are only two known representatives of this family in Tasmanian waters, viz., *Beryx affinis* (G.): *Trachichthys Macleayi*, (Johnston). They are seen on rare occasions, and are consequently of little importance from a utilitarian point of view. The greater number of genera belonging to the family live at great depths. The genus *Beryx* is sometimes found at a depth of over 300 fathoms.

PERCIDÆ. *The Perch Family.*

This family is of considerable importance. It is represented in Tasmanian waters by ten genera and thirteen species.

So far as the fish market is concerned, the most important members are—

1. *Anthias raso* Tasmanian Barber or Red Perch.
2. *Arripis salar* Native Salmon.
3. *Arripis truttaceus*.. Native Salmon Trout.

The first of these is generally caught in the winter season, along with the Trumpeter (*Latris hecateia*); and although not taken in great quantity, it is nevertheless, from its quality, highly esteemed.

The Native Salmon (*A. salar*) are brought to market in the greatest abundance all the year round. They enter rivers and approach wharves in myriads at certain seasons, chiefly in spring, and afford the angler passable sport, as they dash greedily at bait or artificial fly, and sometimes are known to vie with their noble namesake in the plucky manner in which they play the sportsman's reel. It is almost certain (as stated by Prof. M'Coy) that the Native Salmon Trout (*A. truttaceus*) is but the immature form of *A. salar*. In the young state they are barred or spotted,—the markings becoming fainter as they increase in size, and disappearing altogether in the mature forms. They are of handsome shape, sometimes reaching 7 lbs. weight. They are most esteemed for food, however, when they are under 1 lb. weight.

The other members of the group are unimportant either as regards size or numbers brought to market.

MULLIDÆ. *The Red Mullet Family.*

The only known member of this highly-prized family of fishes is the Red Gurnet or Red Mullet of our fishermen (*Upeneichthys porosus*). It is very scarce, however, for it is seldom seen in the market.

SPARIDÆ. *The Bream Family.*

Of the Bream family there are five representatives in Tasmanian waters; viz.—

1. *Chrysophrys australis*, The Common or Silver Günth. Bream.
2. *Girella tricuspidata*, Cuv. The Black Bream. and Val.
3. *Girella simplex*, Rich. . . The Sweep.
4. *Pagrus unicolor*, Cuv. The Snapper. and Val.
5. *Haplodactylus arctidens*, Rich.

Although all the members of this family are valuable food fishes, there are only three of the list which are sufficiently numerous on our Tasmanian coasts to claim our attention as affecting the market supply, viz., the Silver Bream (*C. australis*), the Black Bream (*G. tricuspidata*), and the Sweep (*G. simplex*).

The first of these, the Silver Bream, enters the brackish waters of creeks and rivers during the summer months in considerable numbers. They subsist chiefly upon crabs and other hard-shelled animals which abound in such places, and which they crush with their strong jaws, armed as they are with rows of molar teeth. They are supposed to shed their spawn in the brackish shallows during the months of November and December, returning to the sea before the close of June. At the mouth of Brown's River, the Jordan, the Scamander, and other favourite places, the amateur fisherman could always find abundance of sport in former years; but, latterly, in some of these places their numbers appear to have greatly diminished, chiefly caused, it is affirmed, by the use of fixed nets across the mouths of the streams, by which large quantities of the immature fish are ruthlessly destroyed, and possibly obstructing the ingress of the mature spawning fish. It would be well if a stringent measure were passed by Parliament prohibiting the use or otherwise limiting the fixture of nets in such situations.

The Sweep (*Girella simplex*) and the Black Bream (*Girella tricuspidata*) are not taken in much abundance towards the south of Tasmania, nor do they seem to ascend the estuaries so freely as the Silver Bream (*C. australis*). They are principally vegetable feeders,—their rows of fine incisors, frequently tricuspidate, being well adapted for the purpose. They are most frequently taken together in nets (graball) in the bays of the North-West and North-East Coasts, particularly the Tamar, Port Sorell, Bridport, the Mersey, George's Bay, and the Scamander. Those sent to Hobart are generally caught at Southport.

The Snapper (*Pagrus unicolor*) is seldom seen in the southern waters of Tasmania, even where the reefs, depth of water, and other conditions seem to be favourable. This splendid fish seems to favour the warmer latitudes, for it abounds, and forms the chief market supply, along the coasts of Australia. Its place in Tasmanian waters, especially in the south, seems to be occupied by the Trumpeter family (*Latris*), which latter seems to favour the deep fringing reefs of the colder southern latitudes. The North Coast of

Tasmania lacks the deep fringing reefs which seem to be the favoured resort of the Snapper. This may account for the rare appearance of this fish on our northern coasts, where, from other considerations, it might be expected to be found.

The fifth representative (*Haplodactylus arctidens*) is referred to by Dr. Richardson as found at Port Arthur, but it is seldom seen in the market. It has simple lanceolate incisors, and is a vegetable feeder, like the Sweep and Black Bream.

SQUAMIPINNES.

It is very doubtful whether we have any representative of this family in Tasmanian waters, although the species *Scorpiis Georgianus* (C. et V.) has been stated to have been seen. It is, consequently, of little interest as regards the local fish market. Dr. Günther states with respect to this family, that they abound chiefly in the neighbourhood of coral reefs; and that the beauty and singularity of distribution of the colors of some of the genera are scarcely surpassed by any other group of fishes. Comparatively few are used as food. They are carnivorous, feeding on small invertebrates.

CIRRHITIDÆ. *The Perch and Trumpeter Family.*

This is by far the largest and most important family, so far as the edible fishes of Tasmania are concerned. It comprises 6 genera and 13 species, chief among which are—

The Real Trumpeter (*Latris hecateia*), Rich.

The Red and Silver Bastard (*Latris Forsteri*), Cast.

The Black and Silver Perch (*Chilodactylus macrop-
terus*), Perkins.

The Carp (*Chilodactylus Allporti*), Günther.

The Magpie Perch (*Chilodactylus gibbosus*), Rich.

The Real Bastard Trumpeter (*Mendosoma Allporti*),
Johnston.

The first of these, the Real Trumpeter, or Hobart Trumpeter, is brought to market in considerable abundance all the year round, and is deservedly held in repute as the finest of the Australian edible fishes. It commands a ready market in the neighbouring Colonies, whether fresh, smoke-dried, or salted. Many, indeed, consider the smoked Trumpeter equal, if not superior, to the Finnon Haddock of Scotland (*Gadus æglefinnis*). It is therefore worthy of special notice.

The Trumpeter proper is readily known from the other members of the genus by its finer and more elongate head, and the three or four characteristic longitudinal white bars along the sides of its body. It is very limited in its distribution, and favours the colder southern waters of the Island. The fish are generally found on what are described by the fishermen as coral reefs or banks, 10 to 70 fathoms deep, and 3 to 10 miles off the land. These banks are distributed all round the southern coast of Tasmania, from Macquarie Harbour, in the west, to Seymour, in the east. There is no trustworthy record of Real Trumpeter being caught much further north.* It has been reported that *Latris hecateia* has been found off the coast of Victoria; but, as there are two or three Victorian smacks which regularly fish in Tasmanian waters and bring their fish into Port Phillip direct, it is possible that the supplies so brought into market might be confounded with the supplies brought from the Victorian coast. The duty at one time imposed upon Tasmanian fish might also tend to favour such a belief.

In searching for the right fishing banks, the fishermen test the bottom with heavy sinkers shod with grease. Should there be any traces of coral they consider them favourable indications of the presence of the fish, and they at once proceed to sink their lines, even though it should be 70 fathoms deep. The lines are baited with Crayfish (*Palinurus Edwardsii*), or, afterwards, Sharks' flesh when the fish come about.

The Real Trumpeter takes bait readily; but, owing to the great depth and strong currents upon these outer reefs, the large deep-water Trumpeter has never been attempted to be taken in nets. All the boats employed in fishing for Trumpeter are termed well-boats,—being fitted up with a chamber to which the fresh sea-water has free communication by numerous perforations on the bottom and sides. Immediately the fish are hauled in they are placed in these open wells, and are thus preserved alive until sold in market. Real Trumpeter will thus feed in confinement; and they have been known to live over three months in the well-boats after capture.

There are two well-marked varieties of Real Trumpeter brought to market in Hobart. The one, the Deep Coral-reef variety, large, and usually full of roe or milt, frequently

* Mr. Barrett has since assured me that two specimens were caught near Waterhouse Island in the neighbourhood of deep water.

attains a weight of from 15 to 20 lbs. Specimens have been captured weighing over 60 lbs. The other, termed Pair or School-fish, is smaller, with a darker hue along the back, with yellowish tinge over the lighter parts, especially on throat and belly. The latter is usually found on a rocky bottom, in shallower water, near shore,* and in this state is never found with mature genital organs, and rarely exceeds 6 to 7 lbs. weight. Unlike the immature Bastard, however, the School-fish or Black Trumpeter, which is most probably the immature form of the Deep Coral-reef Trumpeter, is held in most esteem as an article of food, and commands a higher price in the market. The fishermen are of opinion that the two forms represent distinct species; but, as the general characters are identical,—viz., D. 17:1·36-38. A. 3·28-30. P. 9·8-9. L. lat. 110,—and as the smaller form caught in shallower water is never found with the genital organs mature, it is most probable that the latter is the immature form of the larger. It is likely, just as in the well-marked type of Red Bastard Trumpeter (*Latris Forsteri*), that they seek the deeper coral reefs as they approach maturity. No other conclusion seems possible, taking all the facts into consideration.

The Bastard Trumpeter (*Latris Forsteri*), D. 16:1·37-42. A. 3·33-36. P. 9-10·8-9. L. lat. 115-120. Scarcely inferior to the Real Trumpeter, and superior to it in abundance all the year round, comes the Bastard Trumpeter, especially the well-conditioned mature variety known as the White or Silver Bastard. The latter, or mature form, however, is only taken during January, February, and March. This fish has hitherto been confounded with *Latris ciliaris*, (Forst.); but, although the latter species has been reported as existing in Tasmanian waters, it is most probably a mistake: for the two varieties, (the red and white), found in such abundance here, have the general characters as shown above; and although some of them vary within certain limits, there is little doubt but that they must be referred to the *Latris Forsteri* of Count Castelnau, which appears to be the Bastard Trumpeter of Victorian waters. It is true that Castelnau's *L. Forsteri* is described as having only two spines in the anal fin; but most probably this is simply a mistake, and that the Victorian *L. Forsteri* has three spines like all the other representatives of the genus.

The following diagnoses of certain external characters taken indiscriminately from a dozen specimens, will give to

* They have been known to ascend the estuary of the Derwent as far as Hobart.

ichthyologists a notion of the variability of some of them; and when we consider to what extent age and local surroundings modify shape, colour, &c., it may be conceded that it would be hazardous to fix the limits of a species of this genus from an odd or immature individual:—

Latris hecateia, (Rich.) The Real Trumpeter.

	D.	A.	P.	V.	L. lat.
(1)	17 : 1·37	3·29	17 = 9 8 ^{br. s.}	1·5	110
(2)	17 : 1·38	3·30	18 = 9 9	1·5	110
(3)	17 : 1·36	3·28	17 = 9 8	1·5	110

Latris Forsteri, (Cast.) Bastard Trumpeter.

Red variety.

(4)	16 : 1·40	3·36	18 = 9 9	1·5	115-120
(5)	16 : 1·40	3·35	17 = 9 8	1·5	115-120
(6)	16 : 1·37	3·33	18 = 10 8	1·5	115-120
(7)	16 : 1·42	3·34	19 = 10 9	1·5	115-120
(8)	16 : 1·41	3·38	18 = 9 9	1·5	115-120

White or Silver variety.

(9)	16 : 1·38	3·34	19 = 10 9	1·5	115-120
(10)	16 : 1·40	3·36	18 = 9 9	1·5	115-120
(11)	16 : 1·39	3·34	18 = 9 9	1·5	115-120
(12)	16 : 1·41	3·33	18 = 10 8	1·5	115-120

There are to be found individuals which link the two latter varieties imperceptibly together. In exact shade of colour, and number of soft fin rays, scarcely two individuals agree; and hence I am of opinion that the *Latris bilineata* and *L. inornata* of Count Castelnau are merely immature forms of the one variable species common to the waters of Victoria and Tasmania. The first spine of the anal in young specimens may be easily overlooked, and frequently I have observed that in extracting the fish from the meshes of the graball the same spine readily gets broken off. This may account for the anal spines being recorded as 2, instead of 3, in the odd individuals erected into specific rank by Count Castelnau.

The Bastard Trumpeter attains a length of about 21 inches, and rarely exceeds 6 to 7 lbs. weight. It is most prized for food in the Silver Bastard, or mature well-conditioned form. It differs from the Real Trumpeter chiefly in the absence of vomerine teeth, and of the longitudinal bars of light colour along the sides. It has a more broadly oval shape, a shorter and thicker head, and a more fleshy and obtuse snout.

It has, moreover, invariably one spine less in the anterior dorsal; is most abundant on the shallow banks of estuaries, 3 to 6 fathoms deep; enters brackish water more freely; and, unlike the deep coral-reef variety of the real trumpeter, it is generally captured in nets, and rarely takes a bait of any kind. For these reasons it is perhaps scarcely desirable that this abundant species should be included within the same genus as the Real Trumpeter (*i.e.*, *Latris*). Fishermen generally regard the red and silver varieties of the Bastard Trumpeter as distinct species. The reasons given by them are various, but they generally concur in stating that the red is generally a somewhat smaller and leaner fish; it is almost invariably found on a weedy bottom near shore, and in the upper shallow banks of estuaries, all the year round: while the silver, or white form, is larger, better flavoured, better conditioned, and, for the most part, is generally taken in deeper water in the neighbourhood of reefs towards the mouths of estuaries, during three months of the year only. It is significant, however, that they (the fishermen) generally concur in the statement that the red are always lean, and the silver are as invariably fat. The Red Bastard is rarely caught with maturely developed genital organs,—indeed, the fishermen are mostly all of opinion that they are entirely absent in white and red; but this is a mistake, founded probably upon the circumstance that a large white fatty mass invariably covers and nearly conceals the genital organs of the Silver Bastard, while the undeveloped condition in the red is sufficient to justify the erroneous opinion in respect of its supposed sterility.

With regard to the exact spawning season and the spawning-grounds of the Real and Bastard Trumpeter, little is known. We may recapitulate what has been learned, however, with respect to the former:—They are only found with the genital organs in a mature state in the outer coral reefs, 10 to 70 fathoms deep; the School-fish, which are in all probability the half-grown, or immature, are however found in shallower rocky bottoms nearer land, although an odd one of the latter may be caught at times among the mature forms in deep water. It is probable, therefore, that the mature fish spawn on the reefs in deep water; that the young fry afterwards approach the shallower rocky bottom nearer shore, where they grow up into the stage known as "School-fish." As these approach maturity they return to the deep coral reefs from whence they originally migrated.

The movements of the Bastard Trumpeter are probably very similar to those of the Real Trumpeter. Only the Silver form, found on what may be termed the reefs of the

middle fishing-grounds, appear to be found with mature genital organs; and although it has been shown that the "Paper-fish," or fry, and the Red Bastard, which are most probably the immature state of the Silver form, are found in large numbers in the upper shallow banks of the estuaries, yet it is rarely the case that a mature Silver Bastard is caught in such situations. As the Red Bastard is seldom found mature in these shallows, it follows that the parents must spawn towards the middle-ground reefs, *i.e.*, 5 to 6 fathoms water; that, like the Real Trumpeter, the young fry afterwards approach the upper shallow weedy banks, remaining there until the half-grown poor condition of the Red Bastard, when they again return to the parent ground on the reefs of the middle grounds—6 to 7 fathoms deep—where they speedily, from changes in the nature of the food, or from the altered conditions of the bottom as affecting the light transmitted to them, they assume the rounded proportions and the more silvery appearance of their parents. It is also significant as bearing upon the unity of the two varieties, that the colour of the Red form varies to a remarkable extent: sometimes it is uniformly dark rusty brown on snout, head, and along the back and shoulders, lighter and becoming quite silvery under the lateral line; at other times the color is a much brighter red. There are fine longitudinal streaks of light yellow along the junction of each row of scales; they are deeper on the side near lateral line, becoming obsolete towards belly. These streaks are, however, extremely variable; sometimes they are bilinear, with uncolored spaces of equal breadth between each streak. In the latter case there are generally two well marked olive-colored streaks above, and the same number immediately below the lateral line. Frequently, in both cheeks and opercles, plumbous, with a tinge of pink; cavities of protractile jaws green and blue; throat and tongue very deep blue, almost black. The young are always colored, more or less, like the Red, and are known by some as "Paper-fish." The mature form of the Silver Bastard is alone caught. This is conclusive as favouring the opinion that the Silver is simply the mature form of the Red,—the latter seeking the deeper water and gradually changing condition and colour as they grow older. We have still to account for the total disappearance of the Silver, or mature form, during the 9 months of the year from the reefs where they are usually caught by nets. It would appear from the evidence of intelligent fishermen, that they migrate to the outer deep-water reefs, 30 to 70 fathoms deep, where an odd one is now and again caught by hook and line while fishing for the bait-taking Real Trumpeter. It must be borne in mind that the Silver or Red Bastard rarely take bait, and hence

the odd ones caught on these deep grounds when they have disappeared from the breeding-ground of this species (6 to 7 fathoms) are no index whatever of their numbers in deep water.

It has been stated that, by the improper use of seine-nets, immense quantities of the Paper-fish and other young fry are every season ruthlessly destroyed upon the sandy beaches, and that the valuable mature Silver Bastard and other important market fish are becoming scarcer every year. It is reasonable to suppose, therefore, that the wanton destruction complained of in the upper waters of estuaries may have more to do with the increasing scarcity of the Silver Bastard in the outer reefs than the cause usually advanced by the fishermen themselves, *i.e.*, over-fishing.

If it be satisfactorily proved that the Paper-fish thus referred to are really the fry of the Silver Bastard (and there is little doubt of this), it is imperative, in the interests of our fishermen and our permanent fisheries, that some means should be devised for the better protection of the nursery grounds of these important fishes in the upper waters of estuaries.* The deep-water fishes, like the Real Trumpeter, whose young do not seem to ascend as a rule into the upper waters of estuaries, have only their natural enemies to fear, as they are beyond the reach of the destructive seine-net when drawn up upon the sandy beaches. The young of other fish, such as the Perch (*Chilodactylus macropterus*), the Horse Mackerel (*Trachurus trachurus*), the Mullet (*Agonostoma Forsteri*), the Garfish (*Hemirhamphus intermedius*), the Flounder (*Rhombsolea monopus*), and, indeed, the introduced migratory Salmonoids, are also known to be destroyed in a similar manner.

The Black and Silver Perch, (*Chilodactylus macropterus* and *Chilodactylus asperus*.)

The Black and Silver Perch are the next in importance to the Trumpeter group as regards quality and supply. The form known as the Black Perch is particularly an excellent fish,—some preferring it to the Real Trumpeter. The young are to be caught on the numerous rocky banks, in three to four fathoms water, in the upper bays of the

* A law which would regulate the mesh and the mode of using nets in such places might be devised. The working of such a measure might be committed to the existing Salmon and Fisheries Commissions, whose functions might be extended accordingly.

estuaries, especially in those of the Derwent. They are in this state found in more or less abundance all the year round, and are highly esteemed for the breakfast table. In the various bays in the immediate vicinity of Hobart the young Silver Perch, 7 to 8 inches long, afford ample sport to amateur fishermen. The fish take bait readily,—the mussel, boiled, being a favourite; and, during the months of March, April, and May, it is not uncommon for a party of two or three persons to catch from ten to twenty dozen in a couple of hours. The young specimens are invariably of a bright silvery appearance, with a conspicuous dark-coloured transverse bar across the shoulder and posterior lobe of operculum, and terminating towards root of pectorals. This bar becomes obsolete, or is not so conspicuous, in the mature form; and this may partly account for some of the confusion which still exists in the classification of this most variable species. The pectoral fin has one of its simple rays prolonged far beyond the rest; and this simple character readily distinguishes it from nearly all the rest of the family.

The Black Perch (*C. asperus*) is most probably a mere variety of *C. macropterus*. The former is found invariably upon a rocky bottom, and the latter upon a sandy bottom; and the colour is, undoubtedly, the result of the difference in local environment. The young are all silvery.

This species is most variable within certain limits. No two individuals are alike in all the following characters; viz.—dorsal, spinous, and branched rays, anal soft rays, length of longest simple pectoral ray, length of ventral fin, shade of colour. The Black Perch is only distinguished from the Silver by its condition and quality; in all other respects its general character varies within the same limits. Out of twelve specimens, Black and Silver, taken haphazard, the general characters of both forms varied in each individual within the following limits:—

D. 17-18 : 25-28. A. 3 : 12-14. P. 15 (9+6).
V. 1·5. L. lat. 55+4. L. tr. 6 : 13-14.

In some the ventral fin did not reach to the vent; in others it reached as far as the vent; while in one or two individuals it extended beyond the vent. The longest simple ray extends to varying distances between the first and sixth soft rays of anal. Generally the Black Perch is found in deeper water, and attains a greater size. They were in former times found in great abundance in Adventure Bay. They do not carry them in the wells as a rule, however, as they prick each other with their strong dorsal spines, and

so kill and disfigure themselves. This renders it more difficult for fish of this class to be brought to market. Fishermen have to cure them partially when they are hindered in any way from reaching market. Although some are caught in nets with the Bastard Trumpeter, they are usually caught by hook and line. The remarks applying to the destruction of the Bastard apply equally to the Perch. It is most probable that the mature fish spawn in five to six fathoms water; that, like the Trumpeter family, the young immediately after seek the upper shallow banks of estuaries, remaining there until they are half-grown, when they again gradually return to the parent ground, towards the mouths of estuaries.

The Carp. (*Chilodactylus spectabilis*, Hutton: *C. Allporti*, Günth.)

Although the Carp of the fishermen is common in the market, it is not to be depended upon, for the few that are caught are only found at odd times in the graball while fishing at the mouths of estuaries for the Bastard Trumpeter. There is a ready market for all that are taken, however, for, although somewhat coarse-looking fish, they appear to be highly esteemed. They are, moreover, strong fish, and will live a considerable time in the well. They are seldom taken by hook and line. Little is known of their habits. The fish is of a reddish colour, with about six darker transverse bars across the sides. It was formerly known as *Chilodactylus Allporti*; but Dr. Günther has recently referred our local form to the *C. spectabilis* (Hutton), found also in New Zealand. If the description given by Prof. Hutton be correct as regards the prevailing form in New Zealand, it may be doubtful whether the suppression of *C. Allporti* was advisable, as the description of the latter is different in important characters. The Tasmanian form invariably agrees with Dr. Günther's description:—

C. spectabilis. *C. Allporti.*

Height of body in total		
length—times	more than 3 times	$2\frac{1}{2}$ — $2\frac{3}{4}$
Longest ray of simple		
pectorals	1st	2nd
Head contained in total		
lengths	$4\frac{1}{4}$ times	4 times
Dorsal { anterior spinous	blackish	light red
{ posterior soft..	ditto	blackish

If the differences as shown are constantly maintained in the New Zealand form, it may be advisable to retain the specific name *C. Allporti* for the Tasmanian species. Like

the Carp, the Magpie Perch (*C. gibbosus*), and the Real Bastard Trumpeter (*Mendosoma Allporti*), are only taken in limited numbers during certain seasons, upon the Perch and Trumpeter ground. They are both good table fish, however; and it may yet be an important matter to study their habits and movements more closely. It is known that the Real Bastard runs in schools; and large numbers have at times been caught at the Schoutens and at Bicheno. Mr. Barnett, who has great experience as a fisherman in Tasmanian waters, states that they are only good for food when full of roe. I was somewhat astonished, two or three years ago, to find that this fish, which is not altogether an uncommon one in our market, should have escaped the notice of former classifiers. It was described by the writer in the Proceedings of the Royal Society of Tasmania, 1880, pp. 54-56. The following are its general characters:—

B. 6. D. 23:1·25. A. 3·18. V. 1·5. L. lat. 76.
L. tr. 5:16.

The larger scales, greater number of dorsal spines, and the small pointed head with protractile jaws, readily distinguishes it from the members of the Trumpeter group proper.

TRIGLIDÆ.

This is also a somewhat important family of fishes in Tasmanian waters,—consisting of eight genera and eleven species. It includes the fish locally known as the Rock Gurnets, the Flatheads, and the Butterfly, Kumu, and Flying Gurnards. The Rock Gurnet (*Sebastes percoides*), found more abundantly in the northern coasts, is held in great esteem for the table, and is obtained in the vicinity of George Town in considerable numbers. The various individuals are brilliantly coloured red and orange; and, like all its family, are well armed with dangerous head bucklers and sharp spines. The Common Flathead (*Platycephalus bassensis*, Cuv. and Val.), is, however, the most important member of the family on our coasts. The Flatheads are rather repulsive-looking fishes, with reptile-looking flattened heads and bodies; and their sharp gill-cover spines make it awkward for the inexperienced hand when they are captured by hook. They are termed “bottom fish,”—their flattened under surface being well adapted for following close the surface of the ground, like the common Flounder. They may be considered the scavengers of our shallow waters, for they are found everywhere around our coasts, in estuaries and around wharves, all the year round. When no other fish can be obtained the Flathead may always be depended upon. They are good edible fish, and would be

much more highly prized for the table were it not that they are repulsive-looking and are so common.

As regards appearance, the following three members of the family present a wonderful contrast to the last ; viz.—

The Butterfly Gurnard (*Lepidotrigla vanessa*), Rich.

The Flying Gurnard (*Trigla polyommata*), Rich.

The Kumu Gurnard (*Trigla Kumu*), Less. & Gaim.

At times during the winter season these most beautifully coloured fishes, with their gaudily painted pectoral wings, may be seen around our wharves in small schools, dashing, or rather flying through the water, with sudden bounds after their prey. The pectoral fin is a most beautiful object, measuring, expanded, in some individuals of the Flying Gurnard, six inches long by six broad. The under surface is most brilliantly coloured blue, orange, and red, with pure white and blue margins. There are two large conspicuous black patches near the base, which, bordered with deep blue and white, form a most beautiful object in this fish, with its body-scales of burnished golden-yellow and silver. They are rarely captured, however, on our coasts, and are therefore unimportant here from a commercial point of view. It would appear that they are caught more frequently off the coasts of New Zealand. Latterly, the family *Triglidæ* has been divided into two,—the Gurnet group, under the name *Scorpenidæ*; and the Flathead and Flying Gurnard group, under the name *Cottidæ*.

TRACHINIDÆ.

This family is represented in Tasmanian waters by five genera and six species. They include amongst them the Cat Fishes, the Freshwater Flathead or Sandy, and the much prized Whiting. Indeed, for commercial purposes, the latter is the only member of the group which need engage our attention. The Tasmanian Whiting (*Sillago ciliata*, Cuv. and Val.) is a most valuable market fish. It fetches a higher price in the market, for its size, than any other fish. These fish are usually taken in seine-nets, during the months of November, December, and January, in the Derwent and along the East Coast. They also may be taken with hook and line ; and a dozen or so are frequently captured in this way at odd times in the upper waters about Sandy Bay as late as July. They go in schools ; but they are stated to have greatly fallen off in numbers during the last year or two. The reason for this decrease has not yet been satisfactorily determined. They are a delicious little

fish, averaging a quarter of a pound in weight, silvery, with elongate snout and body. The sides are faintly marked with yellowish bars, which become obsolete towards belly.

SCIÆNIDÆ.

There is undoubtedly one member of this family in Tasmanian waters, although it is rarely seen in the market. It is termed the "Kingfish" in Victoria, although it must not be confounded with *Thyrsites Solandri* (Cuv. & Val.), our "Tasmanian Kingfish." The fish belonging to this family is thought by Dr. Günther to be the "Maigre" of European waters—*Sciæna aquilla*. Other naturalists, however, have considered the Australian species to be distinct from the European one, and the late Count Castelnau has given it the name of *S. antarctica*. It is just possible that there may be two species, but this is extremely doubtful. Dr. Günther states the members of this family prefer the neighbourhood of the mouths of large rivers, into which they freely enter, and he also attributes their scarcity in Australia to the fewness of large rivers which enter the ocean.

TRICHIURIDÆ.

This is not a large family of fishes in Tasmanian waters, but the individuals of one genus at least are so abundant, and all the members are so valuable as food, that it may be even reckoned on equality with the Trumpeter group in importance as affecting the market supply. The family comprises the following species; viz.—

1. *Lepidopus caudatus* The Frost Fish.
2. *Thyrsites atun* The Barracouta.
3. *Thyrsites Solandri*..... The Tasmanian Kingfish.

The first of these, "The Frost Fish," is common from the south of England to the south of New Zealand. A specimen was recently taken in the Derwent which measured 5 feet 6 inches long; greatest depth of body behind shoulder, 6 inches; least depth at tail peduncle, three-fourths of an inch; thickness, not much more than an inch. It is captured at odd times during the winter season, and has been known to enter the Derwent as far as Sandy Bay. It is esteemed as the most delicious of all the edible Fishes in New Zealand, where it appears to be caught more frequently.

The next species, "The Barracouta," is caught all round the coast, especially at the mouth of the Derwent, in the greatest abundance, during ten months of the year, (November to October). These fish prey upon the shoals of

young or small fry which swim near the surface—principally sprats, anchovies, &c.; although they are so swift and rapacious that even the English “Sea Trout” and other large fish fall a ready prey to them. In the absence of the still more terrible Kingfish (*T. Solandri*), they reign supreme amongst the scale fishes; their strong jaws, armed with terrible looking teeth, rendering them a most formidable enemy. The fishermen usually take the Barracouta by a rude instrument, first used it is believed by the Maories, and termed a “jig.” The jig is simply a long stick, from the extremity of which a wire or cord is suspended, armed with a double hook attached to a small block of wood. Upon these hooks a bit of colored cloth, or the skin of a shark, may be attached. When the fish are about they may be jigged aboard with wonderful rapidity while the vessels are sailing at any speed. Great quantities are thus caught and brought to market, where they are much esteemed, and, for a limited quantity, command a ready sale. The local market, however, is so limited, that it is easily overstocked; and, although a large quantity is exported, there is not sufficient demand to encourage the fishermen to extend the supply.

There appears to be no systematic curing establishments, where large quantities might be profitably disposed of. Dr. Hector states that dried Barracouta are imported into the Mauritius and Batavia as a regular article of commerce, being worth £17 per ton. This being the case, I am surprised that a trade in this fish, which can be got in the neighbourhood of Hobart almost in unlimited quantities, is not more systematically and extensively carried out. The fish usually measures about three feet long, and averages 8 lbs. in weight. Fishermen say that it would pay them if 3s. a dozen could always be got for them, *i.e.*, under $\frac{1}{2}d.$ per lb. Surely with such a fine fish as this better results might be obtained. It is a reproach to our local enterprise when fishermen complain that “at times there are so many caught that no price can be got for them.”

These remarks equally apply to the next important member of this genus, the Tasmanian Kingfish (*T. Solandri*). This species appears upon our Southern coasts, at times in immense numbers, the height of the season being May and June. Three fishermen have frequently been known to capture over 40 dozen of these fish in a single night, each fish averaging 12 to 14 lbs. in weight. The principal fishing grounds for this important fish are Recherche, Wedge Island, and Adventure Bay. The individual fishes resemble the Barracouta, but may be easily recognised by their

greater thickness, the much larger eyes, and the fewer detached finlets on the tail (two),—the Barracouta having usually six behind the dorsal and anal. They do not approach the surface during the day time. They are always captured during the night, at varying depths from the surface to ten fathoms deep—the bait usually being horse-mackerel or barracouta.

The jaws of the Kingfish are also very formidably armed with strong, long teeth, and they are so voracious that the fishermen are obliged to use strong barbless hooks which are immediately attached to an iron chain and swivel. Even this strong line has been at times insufficient for these powerful fish: recently a large individual was captured, which, when its stomach was opened, disclosed a chain, swivel, and hook, which it must have swallowed some time previous to capture. At the time when it was taken it appeared to be a strong, healthy fish. The Kingfishes do not appear during each season in equal numbers. A few years ago they were to be found entering the bays and inlets towards the mouth of the Derwent in such vast numbers that they were stranded by tons on the long shallow sandy beaches. At such times immense numbers were taken and sold for manure to hop-planters and others. Recently they have not appeared in such numbers, but no satisfactory reason can as yet be assigned for the irregularity of their appearance in this respect. Some reason has been advanced to show that they follow the main body of the Horse-mackerel, which approaches our shores from the south-west, going in a northerly direction. When these shoals of Horse-mackerel are in greatest abundance they are followed by the Kingfish and other enemies in corresponding numbers. Their migratory movements, when better understood, may explain the irregularities which are for the present inexplicable. The Kingfish, although it averages from 12 to 14 lbs. weight, sometimes reaches a weight of 20 lbs. The usual price in the market is 5s. per dozen. When abundant they are largely exported.

Professor M'Coy has described another species, termed by him also "The Tasmanian Kingfish" (*T. micropus*.) It must be extremely rare, however, for I have never seen a specimen, and so far as our local fishermen observe, they are not aware of a second species of Kingfish.

SCOMBRIDÆ.

The family has been divided by some authors into two, under the names *Nomeidæ* and *Cyttidæ*. It includes the following fishes:—

1. The English Mackerel . . . *Scomber Australasicus*,
Cuv. & Val.
2. The Tunny *Thynnus thynnus*, L.
3. The Pilot Fish *Naucrates ductor*, L.
4. The Sucking Fish *Echeneis remora*, L.
5. The John Dorey *Zeus faber*, L.
6. The Bastard John Dorey *Cyttus Australis*, Rich.
7. The Butterfly Fish *Gasterochisma melampus*,
Rich.

The English Mackerel is seen on the East Coast, occasionally in large numbers, each year, moving in a northerly direction. There are few regular fishermen on the East Coast, however, and little is locally known of the habits of these fishes. They have been known to enter the estuary of the Derwent in large numbers as far as Bridgewater, but, owing to the absence of proper means for capturing them, they rarely find their way to the market. This statement also applies to the Bastard John Dorey (*Cyttus Australis*), which is rarely captured, although during the month of May it has been known to enter the estuaries of the Derwent and Tamar in considerable numbers. I am satisfied that the local fishermen have not the proper appliances for the capture of this valuable fish. I suppose a trawl-net is best adapted for their capture, but these nets are not employed here.

The other members of the family enumerated above are only caught at odd times around the coast, and do not affect the market supply. I am doubtful, however, whether the *Zeus faber*, i.e., the true John Dorey, is to be found in Tasmanian waters. It is recorded from Tasmania by Dr. Günther, but it must be exceedingly rare, for I have never seen a specimen.

CARANGIDÆ.

This is a very important family of fishes in Tasmanian waters. It includes the following valuable food fishes:—

- The Horse Mackerel *Trachurus trachurus*, Cuv.
and Val.
- The White or Silver Trevally *Caranx Georgianus*, Cuv.
and Val.
- Port Jackson Kingfish *Seriola Lalandii*, Cuv. and
Val.
- Tasmanian Yellow-tail *Seriola grandis*, Cast.
- Snotgall Trevally *Neptonemus brama*, Günth.
- Mackerel Trevally *Neptonemus dobula*, Günth.
- Port Jackson Snotgall *Neptonemus travale*, Cast.
- Skipjack *Temnodon saltator*, Bl.

The four most important as regards the market, are—The Horse Mackerel, the White or Silver Trevally, the Snotgall Trevally, and the Mackerel Trevally.

The first, the Horse Mackerel, occurs in these waters in vast numbers. The young are seen all round the bays of the upper waters of the Derwent during the autumn. The mature fish are in fair esteem in the market, but the fishermen are prevented from extending the 'catch' of these numerous fishes because of the limited demand. They are not exported. The young appear to form the chief prey of the Kingfish (*Thyrsites Solandri*).

The Silver Trevally are very much prized for food, and are caught at times in considerable quantities in the Tamar and at South Arm during the autumn. Although it is said that they grow to a considerable size, the smaller ones are alone seen in local markets. They are caught by graball and seine, as a rule, but they take bait readily, and may be caught with hook and line. They are extremely pretty, silvery fish, with a barbed keel along each side towards the tail.

The Snotgall Trevally (*Neptonemus brama*), although inferior in quality to the Silver and Mackerel Trevally, from its greater abundance and size is of much greater importance as regards the general market supply. The young enter the upper waters of the Derwent, and are caught by rod and line from the jetties and wharves about Hobart in considerable numbers during the months of March and April. The Snotgall is better flavoured when it is under one pound in weight. The larger individuals are coarser, and are found towards the mouths of estuaries, in deep water. They are frequently found from two to two feet six inches long, and at this size would average twelve to fourteen pounds in weight. They are taken with hook and line, without a sinker, and are thus caught sometimes in very large quantities. They are sold in the market at rates averaging from 8s. to 12s. per dozen for 12 lb. to 14 lb. fish, and are exported in considerable quantities to Victoria, where the larger fish appear to be in greater favour than in the local market.

The Mackerel Snotgall or Trevally (*Neptonemus dobula*, Günth.) seldom reaches a length of twelve inches, is more elongate for its size than the last species, and is esteemed a greater delicacy for the table. Unfortunately, although appearing in the estuary of the Derwent during March and April in considerable numbers in certain years, they are

not always to be depended upon. They mysteriously appear and disappear. This season they have been captured in considerable numbers, with the more common species, around the jetties and wharves ; but it is stated that it has been upwards of four years since they were last seen in the same estuary. Their migratory habits are not very well known. The other members of the family are seldom seen in Tasmanian waters, and are therefore unimportant.

GOBIDÆ, PEDICULATI, BLENNIDÆ, SPHYRÆNIDÆ,
ATHERINIDÆ.

There are fourteen species in Tasmanian waters which belong to the above families, which include the Gobies, the Hand Fishes, the Blennies, the Silver-bellies, and the Tasmanian Jack or Pike. With the exception of the last named, which is rarely captured, they are all small fish ; and, although some of them are peculiarly interesting from a naturalist's point of view, they are of no value whatever in the fish market. They may therefore be ignored in this general sketch.

MUGILIDÆ. *The Gray Mullet Family.*

There are only two representatives of the Mullet Family known to exist in Tasmanian waters ; viz.—

The Sand Mullet.. *Mugil cephalotus*, Cuv. and Val.

The Sea Mullet .. *Agonostoma Forsteri*, Bl.

The first of these is found principally towards the north-east of Tasmania (the Scanmader and George's Bay), and is very highly prized in the market. It attains a much greater size than the following species ; but its distance from the chief towns is sufficient to account for its great scarcity in the market, where it always commands a good price.

The Sea Mullet is caught in the shallow bays of the upper waters of estuaries, particularly those of the Derwent and Tamar, in very large numbers. In the latter river the young ascend regularly as far as the Cataract Bridge, Launceston, every year, about the months of November and December, when they are caught in large numbers by amateur fishermen with the rod and line. It is supposed that they follow the ordinary shoals of prawns which are then found in myriads in the fresh water of the North Esk and in the Tamar. It is most probable that these young fish linger near the spawning beds in the lower salt-water flats until about the time of the appearance of the prawns, and then ascend into the upper fresh-water flats along with

them.* The supposed spawning grounds in the Derwent are situate above Hobart,—viz., Prince of Wales' Bay, Cornelian Bay, Lindisferne Bay, and the various sheltered mud-flats between these points and Bridgewater.

On a holiday hundreds of pleasure seekers may be seen between Bridgewater and Hobart with rod and line,—the chief attraction being Mullet-fishing. The favourite spots between these points on the Derwent appear to be Risdon, Flat Rock, Elwick Jetty, Berriedale, Triffitt's, Austin's Ferry, and Bridgewater. These points, too, are frequented by enthusiastic anglers all the year round. It is no uncommon occurrence for a single angler at these places to land four to six dozen fish, averaging $\frac{3}{4}$ lb. weight. Occasionally individuals are caught reaching $1\frac{3}{4}$ lbs. Prior to the closing of the River Derwent above Hobart for the protection of the introduced Salmonoids, the indiscriminate use of seine-nets almost destroyed the fish in these upper waters. From the evidence of old anglers it appears to be certain that, since the closing of the river, all fish have rapidly increased in numbers, size, and quality; the ruthless destruction of young fry on the nursery grounds has ceased; and it is affirmed with confidence that more fish are now caught with rod and line alone than could be got by sweeping the bays with the seine-net prior to its prohibition in this part of the river. It is also worthy of note that the class who principally fish in these upper waters are tradesmen, to whom the fish caught are a most welcome addition to the household fare. The fish measure, on the average, 8 to 12 inches long, has two dorsal fins, the first considerably in advance of the second, composed of four spines. Otherwise, the fish has a remarkable general resemblance to the Herring; and on this account it is frequently called by that name in New Zealand, where it also seems to be abundant. Dr. Günther states, in respect of other members of this family, that, if attention were paid to their cultivation, great profits could be made by fry being transferred into suitable backwaters on the shore, in which they rapidly grow to a remarkable size. Local advantage might be taken of this suggestion.

CENTRISCIDÆ, GOBIESOCIDÆ.

The only fishes belonging to these families are—

* Dr. Günther states that their food consists of organic substances contained in mud or sand,—their organs of the pharynx being well adapted for filtering the mud or sand which they partially swallow.

The Bugler or Trumpeter. . . *Centriscus scolopax*, L.
 Another species, known as . *Crepidogaster Tasmaniensis*,
 Günth.

They are of no value for food, and are very scarce. The first named fish is also called "Bellows Fish," from its singular resemblance to that instrument. The snout is produced into a long tube.

TRACHYPTERIDÆ. *The Ribbon Fish Family.*

Two representatives of this remarkable family of fishes exist in Tasmanian waters ; viz. :—

The Ribbon Fish *Regalecus gladius*, Cuv. and
 Val.

Spotted ditto *Trachipterus altivelis*.

A specimen of the first named, *R. gladius*, was captured on the shore near the Penguin about 3 years ago, which measured 14 feet long. It was afterwards exhibited in Launceston and Hobart as "The Sea Serpent"—its manelike rays over the head, and its extraordinary length, giving common favour to this idea. The Spotted Ribbon Fish caught recently at Spring Bay, *T. altivelis*, is a smaller fish, but so extremely thin and transparent that it has been preserved by laying it flat upon a paper surface, after the manner of ordinary mounted seaweed. Dr. Günther states with respect to these singular fishes, that when they "reach the surface of the water the expansion of the gases within their body has so loosened all parts of their muscular and bony system that they can be lifted out of the water with difficulty only, and nearly always portions of the body and fins are broken and lost."

GADIDÆ. *The Cod Family.*

This is a most important family of fishes as regards market supply; although it only comprises two species in these waters—

Bull-kelp Cod *Lotella Swanii*, Johnston ;

Rock Cod—Cape Cod *Pseudophycis barbatus*,
 Günth. ;

the individuals of one of these, *P. barbatus*, "Rock-cod," exist in such wonderful abundance that they are captured during a portion of the year in quantities far exceeding the local demand. They are caught in moderate numbers all the year round, although their season for a variety known to fishermen as the Deep-water, or Cape-cod, is from May to September. It would appear that the latter is simply the mature form of the "Rock-cod," which enters the upper waters of estuaries in vast numbers during the

month of May. Certain shallow banks seem to be favourite localities, probably because their food—small squids and crustaceans—exist in such places in great abundance. There is one minute pretty colored pea-shaped crab which seems to be eagerly sought after by them, for during capture large numbers of these tiny crustaceans drop from their capacious mouths while unhooking them. Their numbers entering estuaries during different seasons vary to a remarkable degree. It is not easy to account for this, but it has been noticed that they are most abundant when the “brit” and other crustaceans appear in greatest numbers. It is quite conceivable, therefore, that the seasonal variation of temperature and meteorological conditions may determine to a great extent the development of the small crustaceæ, and through them regulate the natural increase of the Rock-cod and other fishes which so largely subsist upon them. The Rock-cod rarely exceeds $2\frac{1}{2}$ lbs. weight, although its appearance would be apt to lead one to suppose that the ordinary mature individuals are at least double this weight. The prevailing colour is tawny brown on back, creamy or pinkish-white on belly. The dorsal has only two divisions, the anterior one composed of from 9 to 11 soft simple rays. The flesh is rather soft, but it is held in fair esteem as food. It will cure well. When smoked with cedar sawdust they are highly prized. It is stated by experienced fishermen that if greater care were taken in the modes of smoking and curing, our fish would be held in much greater esteem. As the Rock-cod may be caught during the season in quantities far exceeding local demand, it would be well if greater attention were paid to the preservation of this fish, and so secure a wider market.

OPHIDIIDÆ. *Ling Family.*

There are two members of this family in Tasmanian waters; viz. :—

The Ling..... *Genypterus Australis*, Cast.
(*blacodes*?)

Ditto *Fierasfer Homei*, Rich.

The first of these is alone important as regards the market supply. These fish usually are captured on a weedy or rocky bottom, in from 3 to 8 fathoms water, with hook and line. The average weight is about 7 lbs., but individuals are known to reach a weight of 15 lbs. They are sometimes captured on the surface. It would appear that if in pursuit of prey they happen to breach on the surface, they rupture the air-bladder or sustain some other injury. They are held in fair esteem in the market, but are only

caught in numbers at odd times, and therefore cannot be much depended upon.

The second species, *Fierasfer Homei*, Rich., is rarely captured.

PLEURONECTIDÆ. *Flat Fish Family.*

There are four members of this family stated to exist in Tasmanian waters, but only two are found abundantly. These are—

1. The Sole of fishermen . *Annotretis rostratus*, Günth.
2. The Flounder *Rhombsolea monopus*, Günth.

These fishes are generally taken in the shallows of estuaries and along the sandy coasts, by seine-nets. They are among the most highly prized fishes for the table, and are taken in considerable quantities all the year round. They are rarely caught with hook and line. There is a law in existence prohibiting the sale of Flounders under 9 inches, but it would appear from the evidence of various fishermen that the law is evaded to a very great extent. From the evidence of Mr. Barnett it would appear that the individuals brought to the Hobart market are much below the size formerly captured, and he attributes this to overfishing. It would seem to be impossible to regulate the mesh of the seine so as to allow the escape of the young fry of flounders and other important food fishes, and large numbers are destroyed either through wanton carelessness in not immediately returning undersized fish to the water, or because they are actually destroyed by the drawing of the seine-net.

As the use of the seine needlessly destroys young fish far out of proportion to the few captured, its use should be confined to particular localities. It is perhaps difficult to devise a better mode for the capture of certain fish now principally obtained by seine-nets, but it is undoubtedly a barbarous engine of destruction, and it would be of the greatest service if some improvement could be devised which would have the effect of rendering it less destructive to the young fry on the nursery grounds. In the meantime, where there are no naturally protected nursery grounds, such as exist among the snags of the Nelson shoals on the Tamar, the only alternative would be to close particular localities in estuaries so far as the use of the seine-net is concerned.

During former years the Flounder was much more abundant in the waters of the Tamar and Derwent; but,

until recently, when they appear again to be on the increase, their numbers fell off so much that it was hardly profitable to search for them. It was reasonable to assign this decrease to the indiscriminate use of the seine-net, and the partial closure of the two rivers may have something to do with their reappearance in great numbers. It must be granted, however, that other causes unknown may have also operated together with those assigned.

SCOMBRESOCIDÆ. *Garfish Family.*

There is only one species belonging to this family known to exist in Tasmanian waters ; viz.—

The Garfish *Hemirhamphus intermedius*,
Cast.

It is found in great abundance in the shallow waters in estuaries during the summer months, and is most highly esteemed in the market. It does not ascend within the influence of the fresh water so freely as the other migratory fishes, and its capture by seine-net is not affected by the closing of the upper waters of estuaries. There is a good demand for all the Garfish brought to market, and they usually fetch a price from 4*d.* to 9*d.* per dozen. The fish may be captured at any time between April and October. The mesh of the seine-net used in its capture usually measures a quarter of an inch from knot to knot.

GONORHYNCHIDÆ.

There is only one member of this family known locally ; viz. :—

The Sand Eel *Gonorhynchus Greyi*, Rich.

It is rarely captured, however, and is therefore of little interest from a commercial point of view.

HOPLEGNATHIDÆ.

There is only one representative of this family said to exist in our waters, viz., *Hoplegnathus Conwayii*, Rich. ; but it is rarely taken, and is of little importance.

LABRIDÆ. *The Parrot Fish Family.*

There are nine representatives of the Parrot Fish family in Tasmanian waters, of which the following are the most common :—

1. Blue Groper *Cossyphus Gouldii*, Rich.
2. Parrot Fish *Labrichthys bothryocosmus*,
Rich.
3. Purple Parrot Fish .. *Labrichthys fucicola*, Rich.
4. Banded Parrot Fish .. *Labrichthys laticlavus*, Rich.
5. The Ground Mullet or
Kelp Fish..... *Odax balteatus*, Cuv. & Val.
6. The Stranger..... *Odax Richardsoni*, Günth.

The first and last of these seem to be the only members of the family that are held in any degree of favour as food. Fishermen however state that, although not in favour, they are all good for food. It is stated that the Blue Groper, though little appreciated, is exceedingly good. In the Report of the Royal Commission on Fisheries of New South Wales, it is recorded that the head of this fish makes the most delicious dish one can well conceive. The Blue Groper is uniformly dark purplish; the upper profile of head bent downwards in a regular curve; caudal fin truncated; four anterior canine teeth in each of the jaws, sometimes reaching a length of from thirty-nine to forty-two inches. The Stranger is caught occasionally in the upper waters of the estuaries of the Derwent; is in fair esteem for the market,—though, as its name implies, it is only obtained occasionally. It is of a curiously elongate shape, like the Pike, snout produced, body and fins marbled, and streaked with faint yellow. The other members of the family are noted for the beauty of their colours. They invariably feed upon shell-fish, their jaws being well armed for this purpose. The most of them have very thick lips and strong canine teeth. The colours in some of the species vary considerably; and it is possible that this feature may have led classifiers astray in some cases.

CLUPEIDÆ. *The Herring Family.*

Of this important family of fishes there are only three species known to exist in Tasmanian waters; viz.—

- The Anchovy *Engraulis encrasicolus*, var.
Antipodum, L.
- The Sprat *Clupea sprattus*, L.
- The Pilchard *Clupea sagax*, Jenyns.

The two former exist in our waters in vast shoals, and form the prey of the Barracouta, Mackerel, and other fishes. They sometimes ascend into the upper waters of the estuaries of the Derwent and Tamar; and occasionally they have been known to have stranded themselves in millions while pursued by their natural enemies. No attempt has

yet been made to make use of these fishes in Tasmania. No doubt attention will in time be drawn to this valuable source of wealth. At present there are no proper means among us for their capture; their migratory habits are little understood; and there are no establishments in our midst for preserving them. It is not creditable to local enterprise that this source of wealth should have remained so long without an attempt being made to utilise it.

It is unfortunate that our waters should not also contain the *Clupea harengus*, the Common Herring of European waters. The successful introduction of various species of *Salmonidæ* into our rivers from Great Britain gives hope that the Herring may also be introduced. There are great difficulties in the way, but they may in time yield before improved means of transit; and it is not impossible that we may yet see our southern waters the home of this, the most useful of all food fishes.

MURÆNIDÆ. *The Eel Family.*

There are four representatives of this family in Tasmanian waters, but there are only two of them important as regards the market supply; viz.—

The Common Eel *Anguilla Australis*, Rich.

The Conger Eel *Conger vulgaris*, Cuv.

The first of these is referred to under the heading "Freshwater Fishes."

The Conger Eel is brought to market in considerable quantities, and is largely exported. They are caught all the year round, and are sold at a very low price. They vary greatly in size, and weigh from 7 to 50 lbs. They are chiefly taken by hook and line.

PEGASIDÆ, SYNGNATHIDÆ, SCLERODERMI, GYMNODONTES.

The fishes belonging to the above families number twenty-seven species in Tasmanian waters, and include the Pipe Fishes, Sea Dragon, Sea Horses, Leather Jackets, Globe Fishes, Porcupine Fish, Sun Fishes. With the exception of certain individuals of the Leather Jacket Family, there are none of them of any marketable value, and need not engage our attention. The Leather Jackets are singular fishes, with a single erectile, barbed or toothed, dorsal spine, a coarse granular skin, and having wonderfully strong jaws armed with sharp cutting teeth. Some of them are said to be very good for the table when skinned;

but they are not held in esteem in the market, and consequently they are seldom seen there.

CHONDROPTERYGII. *Sharks and Rays.*

The following is a list of this group, so far as known to exist in Tasmanian waters:—

Callorhynchus antarticus,

Lacep. The Elephant Fish.

Carcharias glaucus, L. . . The Blue Shark.

Galeus canis, Rondel. . . The Tope, or School Shark.

Zygæna malleus, Shaw . . The Hammer-headed Shark.

Mustelus antarcticus, Günth. Smooth-head.

Lamna cornubica, Flem. . Porbeagle or Blue Shark.

Odontaspis Americanus,

Mitch. The Grey Nurse.

Alopias vulpes, L. . . . Thrasher.

Notidanus indicus.

Scyllium maculatum . . . Spotted Sea Snake.

Scyllium laticeps. The Sea Snake.

Parascyllium variolatum,

Dum.

Crossorhinus barbatus, L. Wobbegong.

Heterodontus Phillipii,

Lacep. Port Jackson or Bull-head Shark.

Acanthias vulgaris, Risso. Spotted Spiny Dog.

Acanthias Blainvillii, I. . Spiny Dog.

Rhina squatina, L. The Angel Shark.

Pristiophorus cirratus,

Latham Saw-fish.

Pristiophorus nudipinnis,

Günth Saw-fish.

None of these fishes are used as food in Tasmania, although the Dog Fishes are very abundant. Certain of them (*Galeus canis*) are captured, and the livers boiled down for oil. The fins of this shark are also exported for the preparation of isinglass. It is affirmed by the fishermen that the use of deep-sea lines would be valueless here on account of the vast number of destructive Sharks.

TORPEDINIDÆ.

There are four members of this group known in Tasmanian waters, which include the Electric Torpedo, the Thorn Back, and the Stingaree. They are not of any value, however, and may be ignored.

CLASSIFIED CATALOGUE

OF

THE FISHES OF TASMANIA.

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MS. List of Tasmanian Fishes, with references to the folio of Dr. Günther's Catalogue of Fishes. (Papers belonging to Royal Soc. Tas.)

PROFESSOR M'COY :

Fishes: Figures and Descriptions. (Prod. of Zool. of Vic.; Decades I. to IV.)

MRS. MEREDITH :

Friends and Foes. (London, 1881.) Figures and Notes.

R. M. JOHNSTON, F.L.S. :

List of the more important Species of Marine and Fresh-water Fishes, including the Fishes introduced into Tasmanian waters. (Launceston, 4to., 1879.)

Description of Two new Species of Fishes caught in the Estuary of the Derwent. (Pap. and Proc. Roy. Soc. Tas., 1880, pp. 54-57.)

Notes on the occurrence of *Girella tricuspidata* and *G. simplex* in Tasmanian waters. (Proc. Roy. Soc. Tas., 1881.)

FISHERIES ENQUIRY COMMISSION, N. S. WALES :

Report of the Royal Commission, together with Minutes of Evidence, and Appendices. (N.S.W. Parliamentary Paper, 1879-80.)

SUB-CLASSES AND ORDERS.

SUB-CLASS I. *Teleostei*.

Fishes with a bony skeleton and completely separated vertebræ; the posterior extremity of the vertebral column either long or covered with bony plates. Bulb of the aorta simple, with two opposite valves at the origin; branchial free.

ORDER I. *Acanthopterygii*. (*Type*, Trumpeter.)

Some of the rays of the dorsal, anal, and ventral fins not articulated, forming spines; the inferior pharyngeal bones separated. Air-bladder, if present, without pneumatic duct. (Families 1 to 22.)

ORDER II. *Acanthopterygii Pharyngognathi*. (*Type*, Parrot Fish.)

The inferior pharyngeal bones are coalesced, with or without a medium longitudinal suture. Part of the rays of the dorsal, anal, and ventral fins not articulated, forming spines. (Family 23.)

ORDER III. *Anacanthini*. (*Type*, Flounder and Sole.)

Vertical and ventral fins (except in *Gadopsis*) without spinous rays. The ventral fins, if present, are jugular or thoracic. Air-bladder, if present, without pneumatic duct. (Families 24 to 28.)

ORDER IV. *Physostomi*. (*Type*, Salmon and Herring.)

All the fin rays articulated: only the first of the dorsal and pectoral fins is sometimes more or less ossified. The ventral fins, if present, are abdominal, without spine. Air-bladder, if present, with a pneumatic duct. (Families 29 to 38.)

ORDER V. *Lophobranchii*. (*Type*, Sea-horse.)

The gills are not laminated, but composed of rounded lobes, attached to the branchial arches. Gill-cover reduced to a large simple plate. Air-bladder simple, without pneumatic duct. A dermal skeleton. (Families 39 and 40.)

ORDER VI. *Plectognathi*. (*Type*, Leather-jacket: Toad-fish.)

Teleosteous fishes, with rough scales, or with ossifications of the cutis in the form of scutes or spines; skin sometimes entirely naked. Skeleton incompletely ossified, with the vertebræ in small number. Gills pectinate; a narrow gill-opening in front of the pectoral fins. Mouth narrow; the bones of the upper jaw generally firmly united. A soft dorsal fin, belonging to the caudal portion of the vertical column, opposite to the anal: sometimes elements of a spinous dorsal besides. Ventral fins none, or reduced to spines. Air-bladder without pneumatic duct. Nearly all are marine fishes. (Families 41 and 42.)

SUB-CLASS II. *Chondropterygii.* (*Sharks and Rays.*)

Skeleton cartilaginous; skull without sutures. Body with medial and paired fins, the hinder part abdominal; caudal fin with produced upper lobe. Gills attached to the skin by the outer margin, with several intervening gill-openings: rarely one gill-opening only. No gill-cover. No air-bladder. Three series of valves in the bulbus arteriosus. Intestine with a spiral valve. Optic nerves commissurally united, not decussating. Ovaries with few and large ova, which are impregnated, and, in some, developed internally. Embryo with deciduous external gills. Males with prehensile organs attached to the ventral fins.

ORDER 1. *Holocephala.* (*Type, Elephant Fish.*)

One external gill-opening only, covered by a fold of the skin, which encloses a rudimentary cartilaginous gill-cover; four branchial clefts within the gill-cavity. The maxillary and palatal apparatus coalescent with the skull. (Family 43.)

ORDER II. *Plagiostomata.* (*Type, Hammer-shark: Tope: Dog-fish: Skate.*)

From five to seven gill-openings. Jaws distinct from skull. (Families 44 to 56.)

SUB-CLASS III. *Cyclostomata.* (*Type, Lamprey.*)

Skeleton cartilaginous and notochordal, without ribs and without real jaws. Skull not separate from the vertebral column. No limbs. Gills in the form of fixed sacs, without branchial arches, six or seven in number on each side. One nasal aperture only. Heart without bulbus arteriosus. Mouth anterior surrounded by a circular or sub-circular lip: suctorial. Alimentary canal straight, simple, without cæcal appendages, pancreas, or spleen. Generative outlet peritoneal. Vertical fins rayed. (Family 57.)

SUB-CLASS IV. *Leptocardii.* (*Type, Lancelet.*)

Skeleton membrano-cartilaginous and noto-chordal, ribless. No brain. Pulsating sinuses in place of heart. Blood colourless. Respiratory cavity confluent with the abdominal cavity: branchial clefts in great number, the water being expelled by an opening in front of the vent. Jaws none. (One Family only known, No. 58.)

EXPLANATION OF TERMS, &c.

Terms relating to the Head.

Snout.—The upper part of head situate in front of eyes.

Occiput.—The hinder part of the head or skull.

Gill-cover.—Consists of four broad flat bones joined together on each side of the head. The anterior with vertical free margin is called the *præ-operculum*; the upper posterior bone, the *operculum*; the lower posterior bone, the *sub-operculum*; and the bone forming the base, the *inter-operculum*.

Gill-opening.—The vertical opening or *slit* leading to respiratory organs,—the gills.

Branchiostegals.—The bony rays supporting the membrane or cover to the gill-opening.

Maxillary.—The second bone of upper jaw, often flat and inflated, and sometimes armed with teeth. The *inter-maxillary* or *præ-maxillary* is the anterior bone of upper jaw.

Mandibles.—The bones of lower jaw.

Vomer.—The thin bone over roof of mouth dividing nostrils, the base sometimes armed with teeth.

Palatines.—Bones situate on either side of vomer, the base sometimes armed with teeth.

Terms relating to the Body.

The body is composed of *head* and *trunk*. It is *compressed* and *elevated* when it is flattened laterally, as in the Bastard Dorey. It is *depressed* when flattened vertically, as in the Skate. It is *elongate* when shaped like the Salmon.

The narrow extremity of tail is termed the *peduncle*.

The *Lateral line* is the median line along the sides of certain fishes formed by a series of pierced scales. The latter are sometimes interrupted, and may be in one or more rows longitudinally.

Terms relating to the Fins.

Usually there are two "paired" fins on fishes, corresponding to, or, as they are termed, the *homologues* of the fore and hind limbs of the higher *vertebrates*. The first pair (*pectoral*), when present are situate under the shoulder, close to gill-opening. The second pair (*ventral*) are variously placed,—under the chin they are *jugular*; under pectoral, or shoulder, *thoracic*; behind shoulder, *abdominal*. The following are unpaired:—The *dorsal* fin or fins are situate on the median line of the back; the *anal* on the median line between *vent* and *caudal* fin; the *caudal* is placed vertically on the extremity of vertebræ or tail. When the latter is deeply notched, it is *forked* or *furcate*; when margin is concave, *emarginate*; convex, *rounded*; straight, *truncate*.

Finlets.—Small detached rudimentary fins situate behind the dorsal and anal fins, as in the Barracouta.

Terms relating to the Fin Rays.

The fins are either rayless, when composed of a simple fatty integument or skin (*adipose*), or the membrane is supported by fine or stout rays, composed of bone or cartilage.

When the rays are solid and jointless they are termed *spines*; when they are jointed they are *articulate*, and are termed *soft rays*. The latter are either *branched* or *simple*; when the branch is divided at the base it is said to be Y-shaped, and is counted as one ray.

Terms relating to the Teeth.

Teeth are sometimes arranged in bands and patches, or in single or in many series, and may be found on mandibles, maxillaries, vomer, palatines, or tongue; or they may be *absent* in one or all of the situations named. They are *villiform* when very fine, or minute conical teeth arranged in a band; *setiform* shaped, like a bristle; *granular*, small molar teeth; *incisors*, front cutting teeth; *canines*, large projecting dog-like teeth; *pavement-like*, as in certain of the sharks.

Terms relating to the Scales.

Margins simple, *cycloid*; margins serrated or toothed, *ctenoid*; scales with hardened plates of bony enamel, *ganoid*; scales modified into spines, *scutes*.

Abbreviations.

* Edible fish. * * Principal edible fish forming market supply.

(A.) Common to Australia and Tasmania. (Z.) Inhabits New Zealand.

(A.Z.) Common to Australia, Tasmania, and New Zealand.

(T.) Peculiar to Tasmania. (E.) Found also in the waters of the Northern Hemisphere. (I.) Introduced.

B. Branchiostegals. D. Dorsal fin. A. Anal fin. V. Ventral fin. P. Pectoral fin. C. Caudal fin.

L. lat. refers to the series of scales along the lateral line.

L. tr. The series of scales transversely, counting usually from first spine of dorsal obliquely across side to vent. The · or : indicates the division and the number of scales on either side of lateral line.

- The hyphen between figures, that the characters vary to the extent indicated by the figures.

: When this sign occurs between figures, thus—D. 17 : 34, it indicates that the *dorsal* fin has two divisions, 17 rays, usually spines, in the first division, and 34 rays, usually soft *branching rays*, in second division.

· When this sign occurs between figures, thus—A. 3·9, it indicates that, although not properly separated into two divisions, the first series of rays are *spinous*, and the series after the period are soft simple or *branched rays*.

I. II. III. IV. V. VI. When Roman figures are used, thus—D. 17 : 4·12 : VI., they indicate that there are *six finlets* behind the regular divisions of the dorsal fin, as in the Barracouta.

Cæc. pylor. refers to the pyloric appendages, which are short, skinny, cord-like, closed tubes attached to the stomach of some fishes. In the genus *Salmo* they exist in considerable number.

EXPLANATION OF KEY TO ORDERS AND FAMILIES.

THE Key is arranged according to the branched or binary system of the French Naturalist, Lamarck. This plan has been adopted, with great success, by the late Rev. W. W. Spicer, M.A., in his "Handbook of the Plants of Tasmania."

The method consists of a series of pairs of characteristic descriptions so arranged that the student, by commencing with the first pair, is led, by the acceptance always of one out of two propositions, to the next pair by the aid of numbers, which correspond with consecutive index numbers to the several pairs of the descriptive propositions. This course is pursued until the student is finally brought to the *Family* number, which, for distinction, is printed in Roman characters. By turning to the corresponding number in Classified Catalogue, the student may easily find the particular genus and species by means of the symbolic and abbreviated characters given after the name of each species under the family.

For example : if the fish under examination be the *Hobart Trumpeter*, the student would find, under Primary Division, that it agreed with the first proposition of No. 1, which leads to pair No. 4. The examination of No. 4 would lead to the acceptance of the *second* proposition, leading to pair No. 8. It, in turn, by following a similar course, would lead to the adoption of the following, in sequence ; viz.—No. 10, the *first* leading to No. 11 ; No. 11, the *first* leading to No. 12 ; No. 12, the *second* leading to No. 15 ; No. 15, the *first* leading to No. 16 ; No. 16, the *first* leading to No. 17 ; No. 17, the *second* leading to No. 18 ; No. 18, the *first* leading to No. 19 ; No. 19, the *second* terminating in CIRRHITIDÆ—VI. If we now turn to that family in the Classified Catalogue, we would find that the number of spinous and soft rays in Dorsal, Anal, and Pectoral (viz.—D. 17 : 1·36 - 38. A. 3·28 - 30. P. 9·8 - 9.) would finally lead to the true name of species, viz., *Latris hecateia*, Rich.—The Trumpeter.

A little practice will enable any person of ordinary intelligence to determine any of the known Tasmanian fishes by this method.

KEY TO THE ORDERS AND FAMILIES.

PRIMARY DIVISIONS.

1. Fishes with a bony skeleton.
Gills free, with one opening on each side; caudal symmetrical, or absent. TELEOSTEI. 4.
- „ Fishes with a membranous or cartilaginous skeleton.
Gills attached, with several openings. 2.
2. Skeleton cartilaginous. 3.
- „ Skeleton membranous.
Eye rudimentary; mouth a longitudinal fissure. LEPTOCARDII. 67.
3. Body eel-like; mouth circular, suctorial. CYCLOSTOMATA. 67.
- „ Body shark-like; caudal unsymmetrical. CHONDROPTERYGII. 9.

NATURAL ORDERS.

4. All the fin rays soft, articulated.* 5.
- „ Portion of the fin rays spinous, not articulated. 8.
5. Gill-openings more or less wide, one on each side; body scaly or smooth. 6.
- „ Gill-openings reduced to narrow slits, usually situated in front of pectoral fins; body with osseous rings, or skin covered with scutes or spines; never scaly. 7.
6. Ventral fins, if present, jugular or thoracic. ANACANTHINI. 41. (*Type*, Flounder.)
- „ Ventral fins, if present, abdominal. PHYSOSTOMI. 44. (*Types*, Salmon; Herring.)
7. Gill-cover reduced to a large simple plate; body composed of osseous rings. LOPHOBRANCHII. 52. (*Type*, Sea Horse.)
- „ Gill-opening a narrow slit in front of pectorals; body with rough scutes or spines. PLECTOGNATHI. 52. (*Types*, Leather Jacket; Toad Fish.)
8. Inferior pharyngeal bones separated. ACANTHOPTERYGII. 10. (*Type*, Trumpeter.)
- „ Inferior pharyngeal bones coalesced with or without a median longitudinal suture. ACANTHOPTERYGII-PHARYNGOGNATHI. 53. (*Type*, Parrot Fish.)
9. External gill-opening, one covered by a fold of the skin, jaws coalescent with the skull. HOLOCEPHALA. 54. (*Type*, Elephant Fish.)
- „ External gill-openings five to seven; jaws distinct from skull. PLAGIOTOMATA. 55. (*Types*, Hammer Shark; Dog Fish; Skate.)

* In this group is included certain fishes, like the Salmon, whose first ray of dorsal and pectoral is sometimes more or less ossified.

FAMILIES.

10. No adhesive disc between the ventrals. 11.
 „ An adhesive disc between ventrals. GOBIESOCIDÆ—XX.
11. Ventrals thoracic. 12.
 „ Ventrals jugular or abdominal. 33.
12. Spinous dorsal *greater* than the soft. 13.
 „ Spinous dorsal *nearly equal or less* than the soft. 15.
13. One dorsal fin, or if more, with divisions continuous. 14.
 „ Dorsal fins, two, separate.
14. *Teeth feeble; scales none, or minute; body compressed; eyes lateral; suborbital ring articulated with the P.O.; B. 5-7. TRIGLIDÆ, part (SCORPÆNIDÆ)—VII.*
 „ *Teeth several, long, and strong in jaws; cleft of mouth wide; body elongate, compressed; naked, or with minute scales; D. and A. elongate, sometimes with finlets; C. distinct; V. sometimes rudimentary; B. 7-8. TRICHURIDÆ—X.*
15. Spinous dorsal *nearly as long* as the soft. 16.
 „ Spinous dorsal *shorter* than soft. 22.
16. One dorsal fin, or if more, with divisions continuous. 17.
 „ Dorsal fins, *two*, separate; 16 A.; two long barbels under chin; body elongate, covered with large scales. (UPENEICHTHYS POROSUS.) MULLIDÆ—III.
17. Teeth trenchant in front of the jaws or lateral series of molar teeth. SPARIDÆ—IV.
 „ Teeth not so constructed. 18.
18. Scales cycloid or rudimentary. 19.
 „ Scales finely ciliated or ctenoid. 21.
19. Teeth small, in villiform bands on jaws; some on palate. 20.
 „ Villiform teeth on jaws; none on palate; lower pectoral rays simple, and generally stout. CIRRHITIDÆ—VI.
20. Head and præoperculum armed; scales sometimes rudimentary. TRIGLIDÆ, part (SCORPÆNIDÆ)—VII.
 „ Head normal; præoperculum often serrated. PERCIDÆ, part—II.
21. Anal rays 3·9; spines of fins very strong; at inferior limb directed forwards. PERCIDÆ, part—II.
 „ Anal with about 27 soft rays; body compressed, elevated; jaws with an outer series of stronger teeth. The soft dorsal armed, anal falcate, the former covered with scales; uniform brownish. B. 7. D. 9·26. A. 3·27. (SCORPIS GEORGIANUS) SQUAMIPINNES—V.
22. One dorsal fin, or if more, with divisions continuous. 23.
 „ Two dorsal fins, separate. 29.
23. A posterior canine tooth present. LABRIDÆ—XXIII.
 „ Without canine teeth. 24.
24. Three free pectoral rays; head cuirassed. TRIGLIDÆ, part—VII.
 „ Pectorals normal; head not cuirassed. 25.

25. No caudal fin. TRACHYPTERIDÆ—XXI.
- „ Caudal fin present. 26.
26. Spines on each side of tail. CARANGIDÆ, part—XII.
- „ Otherwise constructed. 27.
27. Ventrals with more than five soft rays; opercular bones armed with two distinct spines; scales ctenoid. B. 8 or 4. BERYCIDÆ—I.
- „ Ventrals with five soft rays. 28.
28. Caudal rounded; body compressed and much elevated. B. 7 or 8. SCOMBRIDÆ, part—XI.
- „ Caudal forked. V. 1 : 5. PERCIDÆ, part—II.
29. A papilla near vent; ventrals sometimes united. GOBIIDÆ—XIII.
- „ Without papilla; ventrals not united. 30.
30. Scales ctenoid. 70.
- „ Scales cycloid or absent; with or without finlets. 31.
31. Finlets absent.
 - a. Lateral line not armed with plates; A. fin with less than twenty soft rays. SPHYRÆNIDÆ—XVI.
 - b. Lateral line often armed with plates; two A. spines remote from soft portion; soft rays more than 20. CARANGIDÆ, part—XII.
- „ Finlets present. 32.
32. Ventrals long; scales cycloid, moderate; body oblong, compressed; teeth small. SCOMBRIDÆ, part—XI.
- „ Ventrals moderate; scales absent, or moderately small; teeth variable; V. sometimes rudimentary, or absent; body elongate, compressed. SCOMBRIDÆ, part—XI.
33. Ventrals jugular. 34.
- „ Ventrals abdominal. 38.
34. Spinous dorsal greater than the soft; scale small, or naked; one, two, or three dorsal fins (small fish). BLENNIDÆ—XV.
- „ Spinous dorsal less than the soft. 35.
35. One dorsal fin. 36.
- „ Two dorsal fins. 37.
36. Ventrals of a single bifid ray; a small portion of the D. and A. formed into true spines. GADOPSIDÆ (GADOPSIS MARMORATUS)—XXIV.
- „ Ventrals 1 : 5. Mouth vertical or oblique. TRACHINIDÆ, part—VIII.
37. Body frequently covered with minute spines; carpal bones prolonged, forming a sort of arm for pectorals; gill-opening reduced to a small foramen, situated in or near axil; tentacle sometimes plumose on snout. PEDICULATI—XIV.
- „ Body smooth or scaly; teeth in villiform bands, sometimes with pointed and conical canines; gill-opening wide; eyes frequently directed upwards. TRACHINIDÆ, part—VIII.

33. Two dorsal fins. 39.
39. Mouth produced into a tube; body elevated; teeth, none; scales none, or small; body covered with a cuirass or with nonconfluent ossifications. (CENTRISCUS SCOLOPAX.) CENTRISCIDÆ—XIX.
- „ Mouth not produced; body not elevated. 40.
40. Spines of the first D. more than four. 40a.
- „ First D. with four stiff spines. MUGILIDÆ—XVIII.
- 40a. No barbels; spines of first dorsal feeble, flexible; teeth minute; a silvery band along the side. Minute fishes. Atherinidæ—XVII.
41. Body symmetrical, with an eye on each side of the head. 42.
- „ Body unsymmetrical; both eyes on the same side of the head, on the upper, which alone is coloured. PLEURONECTIDÆ—XXVIII. (*Type*, Flounder.)
42. Ventrals thoracic; tail tapering to a fine point; no caudal. MACRURIDÆ—XXVI. (*Type*, Ling.)
- „ Ventrals jugular. 43.
43. One, two, or three dorsal fins, occupying nearly the whole of the back; one or two A. fins, with or without a barbel; caudal free, or, if united to D. and A., the dorsal has a separate anterior portion; V. with several rays. GADIDÆ—XXV. (*Type*, Rock Cod.)
- „ One dorsal united to caudal; no separate anterior dorsal or anal. OPHIDIIDÆ—XXVI. (*Type*, Ling.)
44. Second dorsal composed of an adipose fin, without bony rays. 45.
- „ No adipose fin present. 47.
45. Dorsal fin very elongate, occupying nearly entire length of back; opercular apparatus incomplete; oviduct present. SCOPELIDÆ—XXX.
- „ Dorsal not elongate; opercular apparatus complete; no oviduct. 46.
46. First dorsal before the vent; margin of upper jaw nearly altogether formed by maxillary; body naked, or scaly; pyloric appendages, none; minute fishes. HAPLOCHITONIDÆ—XXIX. (*Type*, Freshwater Herring.)
- „ First dorsal over the vent in minute species, before the vent in the larger introduced species; body covered with scales; margin of upper jaw formed by the intermaxillaries laterally; pyloric appendages generally numerous. SALMONIDÆ—XXXI. (*Types*, Salmon; Smelt.)
47. Body apparently scaleless. 48.
- „ Body with scales. 49.
48. Dorsal short; belly rounded; vertical fins not continuous with caudal; in creeks, fresh or brackish. GALAXIDÆ—XXXII. (*Type*, Jollytail.)
- „ Dorsal and anal long and continuous with caudal; body rounded or band-shaped; under lens the scales become apparent; no ventrals. MURENIDÆ—XXXVIII. (*Type*, Freshwater Eel.)

49. Mouth with barbels; scales spiny; mouth inferior; gill-opening narrow. GONORHYNCHIDÆ—XXXV.
 „ Barbels, none. 50.
50. A series of keeled scales on each side of belly; mouth terminal; lower jaw produced; dorsal opposite to anal. SCOMBRESOCIDÆ—XXXIII. (*Type*, Garfish.)
 „ Sides not armed with keeled scales. 51.
51. Abdomen frequently compressed into a serrated edge. CLUPEIDÆ—XXXVI. (*Types*, Anchovy; Sprat.)
 „ Abdomen rounded. Freshwater fishes. CYPRINIDÆ—XXXIV. (*Types*, Carp; Tench; Gold Fish.)
52. Bony fishes, composed of plates or osseous rings; dorsal rays; teeth minute or absent. 68.
 „ Fishes with rough scutes or spines; jaws armed with distinct teeth. 69.
53. Marine fishes, generally with brilliant colours; frequently armed with canine teeth. LABRIDÆ—XXIII. (*Type*, Parrot Fish.)
54. One external gill-opening only; produced snout, with soft pear-shaped appendage. CHIMERIDÆ—XLI. (*Type*, Elephant Fish, *Callorhynchus antarcticus*, Lacep.)
 „ External gill-openings, 5 to 7. 55.
55. Eye with a nictitating membrane. Two dorsals and an anal. CARCHARIDÆ—XLIV.
 Eye without a nictitating membrane. 56.
56. Anal fin present. 57.
 „ No anal fin. 60.
57. Two dorsal fins. 58.
 „ One dorsal fin opposite anal. NOTIDANIDÆ—XLVII.
58. First dorsal above or behind the ventrals. SCYLLIDÆ—XLVI. (*Type*, Dog-fish.)
 „ First dorsal between pectorals and ventrals. 59.
59. Teeth acute. LAMNIDÆ—XLV.
 „ Teeth obtuse. CESTRACIONIDÆ—XLVIII. (*Type*, Port Jackson Shark.)
60. Gill-openings lateral. (Sharks.) 61.
 „ Gill-openings ventral. (Rays.) 63.
61. Snout much produced, with lateral saw-like teeth. PRISTIOPHORIDÆ—LI. (*Type*, Saw-fish.)
 „ Snout normal. 62.
62. Dorsal fins, two, without spines. RHINIDÆ—L. (*Type*, Angel Shark.)
 „ Dorsal fins each armed with a spine. SPINACIDÆ—XLIX. (*Type*, Spotted Dog-fish.)
63. Snout produced. 64.
 „ Snout not produced; rounded; caudal well developed. TORPEDINIDÆ—LIII. (*Type*, Torpedo.)

64. Snout with a detached pair of cephalic fins; spine on the tail; sides of head free from pectoral fin. MYLIOBATIDÆ—LVI. (*Type*, Whip-tail Ray.)
 „ Snout otherwise constructed. 65.
65. Pectorals not extending to snout; two dorsals on tail. RHINOBATIDÆ—LII.
 „ Pectorals extending to, or confluent at, extremity of snout.
66. Spine on tail; tail without lateral longitudinal folds. TRY-
 GONIDÆ—LV. (*Type*, Stingaree.)
 „ Two dorsals on the tail; tail with a longitudinal fold on each side; no serrated caudal spine. RAJIDÆ—LIV. (*Type*, Skate.
67. Head without barbels; sometimes with pouch under throat; fresh-water. PETROMYZONTIDÆ—LVII. (*Type*, Lamprey.)
 „ Cirri on each side of fissure-like mouth; marine. CIRROSOTOMI—LVIII. (*Type*, Lancelet.)
68. Ventral fins present. PEGASIDÆ—XXXIX.
 „ No ventral fins. SYNGNATHIDÆ—XL.
69. The elements of a spinous dorsal and ventral fins generally present. SCLERODERMI—XLI.
 „ No spinous dorsal. No ventrals. Pectoral fins. A soft dorsal, caudal, and anal fin. GYMNODONTES—XLII.
70. Præoperculum armed. TRIGLIDÆ, part—VII (COTTIDÆ.)
 „ Præoperculum not armed. SCLENIDÆ—IX.



CLASSIFIED CATALOGUE

OF

T A S M A N I A N F I S H E S.

Sub-class I. **Teleostei.**

Fam. I. BERYCIDÆ.

1. **BERYX AFFINIS**, G. (A.) *Nannegai* of Sydney Fishermen.
D. 7 : 12. A. 4 : 12 - 13. V. 1 : 7. L. lat. 41 - 43.
L. tr. 6 : 12.
Günth. Cat. I., p. 13. Allp. MS. Macleay's Cat., 317.
Rare.
2. **TRACHICHTHYS MACLEAYI**, Johnston. (T.)
D. 5 : 13. A. 3 : 10. V. 8. L. lat. 50. Ventral keel
13 scutes.
Proc. Roy. Soc. Tas., 1880.
Rare. Derwent. Colour, uniform bright golden yellow.

Fam. II. PERCIDÆ.

3. **PERCA FLUVIATILIS**, Rondel. (I.) *English River Perch*.
Common Reservoir, Stony Steps, Hobart; Lake Dulverton; Early Rises; Breadalbane.
4. **CALLANTHIAS ALLPORTI**, Günth. (T.) *Allport's Perch*.
D. 11 : 10. A. 3 : 10. L. lat. 46.
Ann. and Mag. Nat. Hist., 1876, vol. XVII., p. 390.
Allp. MS. Macl., 14.
Rare. Species described from two specimens sent to Dr. Günther by Mr. Morton Allport.
5. **ANTHIAS RASOR**, Richards. (A.) *Red Perch* or *Tasmanian Barber*.
D. 10 : 21. A. 3 : 9. L. lat. 54. L. tr. 4 : 18.
C. pylor. 6.
Günther's Cat., I., p. 93. Allp. MS. Macl. Cat., 16.
Common during the winter season, mouths of estuaries.
Scorpius Hectori, Hutton, appears to be very similar in most respects (even to ornament) to this species, which is in high esteem in the market during the season.

6. MICROPERCA TASMANIÆ, nov. sp. *Native Freshwater Perch.*

D. 8 : 1·7 - 8. A. 3·8. V. 1·5. L. lat. 28 - 30.

L. tr. 12. P. 13.

Body compressed. Length of head equal to depth of body at shoulder, and contained in total length four times. Præoperculum not serrated. Scales relatively large ctenoid. Eye large, nearly as broad as length of snout; the latter contained in head four times; dorsal deeply cleft; the first spine slightly pointing forward when erect; situated immediately over the posterior extremity of pectoral; the second and third spines longest. Anal commencing in a vertical line, scarcely in advance of the first spinous ray of second dorsal. The second dorsal and the anal soft rays gradually increase in width, the last two or three being of equal length, and nearly half the height of the body. Caudal peduncle somewhat elongate. Caudal truncate. Colour dark olive, with a pinkish streak along the sides from shoulder to tail. Base of dorsal, anal, and caudal pinkish, with blackish margins. Belly silvery, tinged with gold. Eye dark blue, with golden streak around eye-ball. Abundant in the rivers of the South and North Esk. The young are found in large numbers in the shallow lagoons having connection with the rivers during some portion of the year. Length, 3 inches to 3½ inches.

7. LATES COLONORUM, Günth. (A.) *Brackish-water Perch.*

D. 8 : 1·10. A. 3·8. L. lat. 55. L. tr. 8 : 21.

Macl. Cat., 2. George's Bay (Swan).

I have seen one specimen from Anson's Lagoon. This species is said to be abundant in the fresh and land-locked brackish waters of the North-east Coast, particularly Anson's River. (Swan.)

8. APOGON GUNTHERI, Cast. (A.)

D. 7 : 1·9. L. lat. 26. L. tr. 11 - 12.

Cast. Proc. Zool. Soc. Vic., I., p. 46. Allp. MS.

(*Novæ Hollandiæ.*) Macl. Cat., 91.

Rare. Considered by Mr. Macleay that it may be identical with Val., *A. Novæ Hollandiæ.*

9. ARRIPIS TRUTTACEUS, Cuv. and Val. (A.Z.) *The Native Salmon.**

D. 9 : 16 - 17. A. 3 : 10. L. lat. 48 - 52. L. tr. 6 : 12.

Cæc. pylor. 50.

(*A. salar*, Rich.) Günth. Cat., I., p. 253. Allp. MS.

Macl. Cat., 112.

Young entering estuaries in great numbers. Abundant all the year round. The young are spotted and barred. The markings disappear in mature individuals. (*A. salar*.)

10. HISTIOPTERUS RECURVIROSTRIS, Rich. (A.) *Boar Fish.**

D. 9 : 15. A. 3·10 - 11. V. 1 : 5. P. 18. L. lat. 130.

Rich. Voy. *Erebus* and *Terror*, p. 34. Cast. Proc. Zool.

Soc. Vic., I., p. 109. Allp. MS. Macl. Cat., 156.

Captured occasionally in the Derwent.

11. *ERYTHRICHTHYS NITIDUS*, Rich. (A.Z.)
 B. 7. D. 9 : 3 : 1·9 - 10. A. 5·10. L. lat. 96.
 L. tr. 8 : 20.
 Günth. Cat., I., p. 395. Allp. MS. Macl. Cat., 185.
 Rare.

Fam. III. MULLIDÆ.

12. *UPENEUS POROSUS*, Cuv. and Val. (A.Z.) *Red Mullet*.
 D. 8 : 1·8. A. 7. L. lat. 30.
 Günth. Cat., I., p. 400. Allp. MS. Macl. Cat., 227.
 Rare. I have not seen any specimens.

Fam. IV. SPARIDÆ.

13. *GIRELLA TRICUSPIDATA*, Cuv. and Val. (A.) *Black Bream*.**
 D. 15 : 11 - 13. A. 3·11 - 12. L. lat. 50 - 54.
 L. tr. 10 - 11 : 20 - 23.
 Günth. Cat., I., p. 428. Macl. Cat., p. 231.
 Common Formby, Port Sorell, George's Bay, Southport.
 Does not ascend estuaries as far as *Chrysophrys Australis*,
 (Günth.)
14. *GIRELLA SIMPLEX*, Rich. (A.) *The Sweep*.**
 D. 15 - 14 : 12 - 13. A. 3·11 - 12. L. lat. 55.
 L. tr. 11 - 12 : 20 - 23.
 Günth. Cat., I., p. 429. Macl. Cat., 232.
 Common Southport. Taken with *G. tricuspidata*.
15. *HAPLODACTYLUS ARCTIDENS*, Rich. (T.)
 D. 16 : 1·18. A. 3·7. Cæc. pylor., 4. Vert. 16 : 18?
 Günth. Cat., I., p. 335. Allp. MS. Macl. Cat., 240.
 Port Arthur. Rare.
16. *CHRYSOPHRYS AUSTRALIS*, Günth. *The Tasmanian Silver Bream*.**
 D. 11 : 10 - 11. A. 3·8. L. lat. 44 - 45. L. tr. 5 : 13.
 Günth. Cat. I., p. 494. Allp. MS. Macl. Cat., 259.
 Abundant during certain seasons at the mouths of rivers
 and streams. Scamander River, George's Bay, Brown's
 River, Jordan River.
17. *PAGRUS UNICOLOR*, Cuv. and Val. (A.Z.) *Schnapper*.**
 D. 12 : 10. A. 3·8. L. lat. 52. L. tr. 8 : 17.
 Cæc. pylor. 5.
 Günth. Cat., I., p. 468. Allp. MS. Macl. Cat., 255.
 Abundant on Australian coasts. Not common. Its place
 seems to be occupied in Tasmanian waters by the Trum-
 peter (*Latris hecateia*, Rich.) (See GEN. OBS.)

Fam. V. SQUAMIPINNES.

18. *SCORPIS GEORGIANUS*, Cuv. and Val. (A.)
 D. 9 : 26. A. 3 : 27.
 Günth. Cat., II., p. 64. Allp. MS. Macl. Cat., 209.
 Rare. Not seen.

Fam. VI. CIRRHITIDÆ.

- 19.
- CHIRONEMUS MARMORATUS*
- , Günth.
- Large Kelp-fish*
- .*

D. 14 : 1·18. A. 3·6. L. lat. 55.

Günth. Cat., II., p. 76. Macl. Cat., 263.

Caught occasionally towards the mouth of the Derwent.

- 20.
- CHILODACTYLUS SPECTABILIS*
- , Hutton.

D. 17 : 26. A. 3·9. L. lat. 55. L. tr. 5 : 16.

Hutton, Cat. New Zealand Fishes, p. 8. Allp. MS.

Macl. Cat., 272.

Not seen. (See *C. Allporti*, Günth.)

- 21.
- CHILODACTYLUS ALLPORTI*
- , Günth.
- The Carp*
- .

D. 17 : 25 - 28. A. 3·9. P. 8·6. L. lat. 55 - 56.

Günth. Ann. Nat. Hist., 1872, vol. X., p. 184.

Macl. Cat., (*C. spectabilis*), 272.

Common around the coast. Abundant Wedge Bay, 5 to 6 fathoms. Caught in graballs. I have retained, for the present, this species, notwithstanding the fact that Dr. Günther has suppressed the name in favour of Hutton's *C. spectabilis*. The differences, which are constant, are, that in *C. Allporti* the fourth spine of dorsal is never as long as fifth and sixth; the fifth, sixth, and seventh being nearly equal, and longest. In *C. spectabilis* the upper one of the six simple rays appears to be longest: in *C. Allporti* the second uppermost is invariably the longest. In the latter, too, the anterior dorsal at least is light reddish, not blackish, as in the description of the New Zealand form.

- 22.
- CHILODACTYLUS MACROPTERUS*
- , Rich.
- Black and Silver Perch*
- .**

D. 17 - 18 : 25 - 28. A. 3·12 - 14. P. 9·6.

L. lat. 55+4 - 5. L. tr. 6 : 13 - 15.

(C. *asperus*, Rich.) Günth. Cat., II., p. 78-9.

Allport MS. Macl. Cat., 267, 268.

Abundant all the year round. Mature individuals in the neighbourhood of reefs 5 to 6 fathoms. Young ascend to the shallow banks of estuaries. The Black Perch is most esteemed as food. A most variable species. (See GEN. OBS.)

- 23.
- CHILODACTYLUS NIGRIPES*
- , Rich.

D. 18 : 26. A. 3·10. L. lat. 61. 5 simple pectoral rays.

Günth. Cat., II., p. 82. Allp. MS. Macl. Cat., 270.

Approaches the variable *C. macropterus* very closely. I have not seen any specimens. Doubtful.

- 24.
- CHILODACTYLUS GIBBOSUS*
- , Rich.
- The Magpie Perch*
- .**

D. 17 : 26 - 33. A. 3·9 - 10. L. lat. 63. 6 simple rays.

Günth. Cat., II., p. 84. Macl. Cat., 271.

Not uncommon. Caught off Wedge Bay, in 5 to 6 fathoms water, in graball. In the Tasmanian specimens there are invariably 6 simple pectoral rays, the second uppermost

being longest, the third nearly reaching to it. The prominent feature however, not noted in the original description, is the two broad dark brownish transverse bands,—the first, from the fifth to the thirteenth dorsal spines, running obliquely backwards and terminating under the belly behind ventral; the second, from about the third to the eleventh soft dorsal spines, terminating towards the posterior rays of anal. It is doubtful whether the Tasmanian form can fairly be included within the *C. gibbosus*, Rich.

25. *NEMADACTYLUS CONCINNUS*, Rich.

D. 17 : 28. A. 3·15. L. lat. 50. Cæc. pylor. 4. Vert. 34.

Günth. Cat., II., p. 85. Allp. MS. Macl. Cat., 275.

Rare. Port Arthur. I have not seen any specimens. I have often seen the scales rubbed off the opercles of *Chilodactylus macropterus*: in this state the latter would agree with *Nemadactylus concinnus* in nearly every respect, with the exception of number of branchiostegals, which latter may be an abnormal feature in the original type. Requires confirmation.

26. *LATRIS HECATEIA*, Rich. (Z). *The Trumpeter*.**

D. 17 : 1. 36-38. A. 3·28-30. P. 9·8-9. L. lat. 110.

Günth. Cat., II., p. 86. Allp. MS. Macl. Cat., p. 276.

Abundant all the year round. Esteemed as the finest of all our edible fishes. Caught—"school-fish," half-grown, in 10 to 20 fathoms water; the mature fish in 20 to 80 fathoms on coral reef banks or reefs, Macquarie Harbour to Seymour. (See GEN. OBS.)

27. *LATRIS FORSTERI*, Cast. (A). *The Red and Silver Bastard Trumpeter*.**

D. 16 : 1. 37-42. A. 3·33-36. P. 9-10·8-9. L. lat. 115-120.

Cast., Proc. Zool. Soc. Vic., vol. I., p. 77. Macl. Cat., 278.

The young and half-grown fish, known as Red Bastard Trumpeter, are got in shallower banks of the estuaries in great abundance all the year round. The Silver or mature Bastard Trumpeter is only taken in graball nets, in 5 to 6 fathoms water, during January, February, and March. It would appear that the mature fish live at a great depth, 20 to 80 fathoms, all the remainder of the year, and only approach the shallower reefs, 5 to 6 fathoms deep, during spawning season. Next to the Real Trumpeter, the Silver Bastard is most prized for food. Abundant during the season, January to March. (See GEN. OBS.) (*L. inornata*, Cast.), (*L. bilineata*, Cast. ?)

28. *LATRIS CILIARIS*, Forst.

D. 17 : 39. A. 3·32. L. lat. 84. Six simple pectoral rays.

Günth. Cat. II., p. 86. Allp. MS. Macl. Cat., 277.

I have never seen this species in Tasmanian waters. I am of opinion that local naturalists have hitherto confounded the last species with *L. ciliaris*, Forst., and that it does not exist here.

29. *MENDOSOMA ALLPORTI*, Johnston. *The Real Bastard Trumpeter*** of Fishermen.

B. 6. D. 23 : 1·25-26. A. 3·18-19. P. 15-16.

L. lat. 72-74; L. tr. 5 : 16-17.

Proc. Roy. Soc. Tas., 1880, pp. 54-55.

Not uncommon during the winter season. Found while Trumpeter-fishing off the south-east coast.

Fam. VII. TRIGLIDÆ.

(Includes the *Scorpenidæ* and *Cottidæ*, erected into independent families in recent works.)

30. *SEBASTES PERCOIDES*, Soland. (A.Z.) *Gurnet*.*

D. 11 : 1·12. A. 3·5. L. lat. 60-65.

Günth. Cat., II., p. 101. Allp. MS. Macl. Cat., 282.

Abundant about George Town; common round the coasts on rocky bottom. *S. Allporti*, Cast., appears only to be a variety of *S. percoides*.

31. *SCORPÆNA CRUENTA*, Soland. (A.Z.) *Gurnet*.

D. 11 : 1·10. A. 3·5. L. lat. 45?

Günth. Cat., II., pp. 115, 520. Allp. MS. Macl. Cat., 284.

Common on shallow rocky bottom all round the coasts and estuaries. The species common about Hobart has only 25 rows of scales along lateral line. Either Solander's species is wrongly described in this particular, or the Tasmanian form is a distinct species.

32. *SCORPÆNA PANDA*, Rich. (A.Z.)

D. 12 : 1·8. A. 3·5. L. lat. 67.

Günth. Cat., II., p. 117. Allp. MS. Macl. Cat., 287.

Not common.

33. *GLYPTAUCHEN PANDURATUS*, Rich. (A.)

D. 17 : 7. A. 3·6. V. 1·5.

Günth. Cat. II., p. 121. Allp. MS. Macl. Cat., 291.

Rare.

34. *HOLOXENUS CUTANEUS*, Günth. (T.)

D. 7 : 3·10. A. 9. C. 12. V. 1·5.

Ann. Mag. Nat. Hist., 1876, vol. XVII., p. 393.

Allp. MS. Macl. Cat., 299.

I have not seen the above, but I have good reason for supposing that the fish, not otherwise mentioned, known here as the *Velvet Fish*, is probably the same, although the spinous characters are not in agreement with those of *H. cutaneus*. They are as follows:—

B. 5. D. 8 : 5·10. A. 3·9. C. 12-13. V. 1·5. *Velvet Fish*.

The body is compressed, covered like the fins with loose skin, which in a great measure connects and conceals the minute spinous rays in the sinus between the anterior and posterior dorsal rays. The whole of the skin on body and fins is covered with minute glandular skinny appendages, so soft to the touch as to give the notion of velvet. The colour, when fresh, is a uniform deep purple, sometimes more or less marbled with yellow, which probably changes to white in spirits. The teeth are more

granular than villiform. Average total length, 10 inches. In all other respects it agrees with *H. cutaneus*. Should it prove to be a distinct species I propose for it the name *Holoxenus Güntheri*.

35. PENTAROGÉ MARMORATA, Cuv. et Val. (A). *The Soldier*.
B. 7. D. 12 - 13 : 10. A. 3·6.
Günth. Cat., II., p. 132. Allp. MS. Macl. Cat., 300.
Common in shallow banks of estuaries. The spines are evidently poisonous weapons, as they inflict painful wounds.
36. PLATYCEPHALUS BASSENSIS, Cuv. et Val. (A). *The Common Red Flathead*. *
D. 1 : 7 : 14. A. 14. L. lat. 115.
Günth. Cat., II., p. 179 (*Tasmanius*). Allp. MS. Macl. Cat., 444.
Abundant all round the coasts and estuaries.
37. PLATYCEPHALUS CINEREUS, Günth. (A). *The Black Flat-head*. *
D. 1 : 7 : 12. A. 12. L. lat. 120.
Allp. MS. Macl. Cat., 450.
Brought to market rarely. Not uncommon.
38. LEPIDOTRIGLA VANESSA, Rich. (A.) *Butterfly Gurnard*. *
D. 11 : 17. A. 17. L. lat. 70. Cæc. pylor. 8.
Günth. Cat., II., p. 197. Allp. MS. Macl. Cat., 461.
Captured occasionally in the estuaries of the Derwent and Tamar.
39. TRIGLA POLYOMMATA, Rich. (A.) *The Flying Gurnard*. *
D. 7 - 9 : 12 - 13. A. 12. Cæc. pylor. 8.
Günth. Cat., II., p. 204. Allp. MS. Macl. Cat., 464.
Not uncommon, during May and June, in the estuaries of the Derwent and Tamar.
40. TRIGLA KUMU, Less. and Garn. (A.Z.) *The Kumu Gurnard*. *
D. 9 - 10 : 16 - 17. A. 15. Cæc. pylor. 6.
Günth. Cat., II., p. 204. Macl. Cat., 463.
Rare. Derwent.

Fam. VIII. TRACHINIDÆ.

41. KATHETOSTOMA LÆVE, Bl. (A.Z.) *Stone-lifter; Cat-fish*.
D. 17. A. 17. V. 1·5.
Günth. Cat. II., p. 231. Allp. MS. Macl. Cat., 406.
Not uncommon on northern coasts.
42. PERCIS ALLPORTI, Günth. (T.)
D. 5 : 21. A. 16. L. lat. 62. L. tr. 3½ : 15.
Allp. MS. Macl. Cat., 409.
Rare. Derwent.

43. *APHRITIS URVILLII*, Cuv. and Val. (T.) *Freshwater Flathead or Sandy*.*

D. 6 : 19. A. 25. L. lat. 65. Cæc. pylor. 4.

Günth. Cat., II., p. 242. Allp. MS. Macl. Cat., 410.

Common in the lower waters of fresh-water streams near to the sea, especially on the eastern coast. All the specimens examined by the writer had seven spines in anterior dorsal fin. The first spine is invariably closely adpressed to the second, and hence the possibility that a mistake has been made.

44. *SILLAGO CILIATA*. Cuv. and Val. (A.) *The Whiting*.**

D. 11 : 1·17 - 18. A. 2·18 - 19. P. 14 - 15. L. lat. 70.

L. tr. 4 - 5 : 11 - 12.

Günth., II., 245. Allp. MS. Macl. Cat. (*Bassensis*), 414.

The characteristic form found occasionally in abundance during the months of November, December, and January has the above characters. When caught, however, there are six to seven faint irregularly oblique bars running across the sides in a forward direction from dorsal to lateral line. Faint oblique streaks of olive upon interspaces between dorsal rays. There are invariably 70 rows of scales along lateral line. Depth in total length varies from $4\frac{1}{2}$ to $5\frac{1}{2}$ times. Average length 10 inches. The Tasmanian Whiting may be an intermediate form linking *S. maculata* (Quoy and Gaim.) and *S. ciliata* (C. and V.) Highly esteemed as food.

45. *SILLAGO MACULATA*, Quoy and Gaim. (A.) *Spotted Whiting*.**

D. 11 : 1·20. A. 1·21. L. lat. 70. L. transv. 5·6 : 7.

Günth. Cat. II., 245. Macl. Cat., 412.

It is doubtful whether this form exists in Tasmanian waters. Some of the last-mentioned variable species, however, can with difficulty be separated from *S. maculata*.

46. *BOVICHTHYS VARIEGATUS*, Rich. (A.)

D. 8 : 18. A. 13.

Günth., II., p. 250. Allp. MS. Macl. Cat., 419.

Rare.

Fam. IX. SCIÆNIDÆ.

47. *SCIÆNA ANTARTICA*, Cast. (A.) *Victorian Kingfish*.

D. 9 : 1·27. A. 2·7. P. 17. L. lat. 68.

Allp. MS. Macl. Cat., 329. Cast. Proc. Zool. Soc., vol. I., p. 100.

Rare in Tasmanian waters.

48. *SCIÆNA AQUILA*, Lacep. (E.) *European Maigre*.

D. 10 : 1·26 - 27. A. 2·7. L. lat. 53. L. tr. 11·20.

Günth. Cat., II., p. 292. Allp. MS. Macl. Cat. (*Antartica*), 329. Cast. (*Antartica*). Proc. Zool. Soc., vol. I., p. 100.

There is some reason for the belief that only one species exists in Australian waters. As Dr. Günther recognises an

important difference in *L. lat.* as of specific value, there is no doubt but that Cast. *S. antartica* is distinct from the *Maigre* of Europe. I have, however, retained both species, as it is conceivable that both forms may exist in Tasmanian waters.

Fam. X. TRICHIURIDÆ.

49. *LEPIDOPUS CAUDATUS*, White. (Z.E.) *The Frost Fish* or *Scabbard Fish*.

D. 102 - 104. A. 24 - 25. Cæc. pylor. 23. Vert. 41 : 71.

Günth. Cat., II., p. 341. Allp. MS. Macl. Cat., 333.

Odd individuals caught in the Derwent occasionally in the winter. Wide-world in its range of distribution,—Europe, Africa, Australia, and New Zealand.

50. *THYRSITES ATUN*, Cuv. and Val. (A.Z.) *The Barracouta*.**

D. 20 : 1·10 : VI. A. 1·10 : VI. Vert. 37.

Günth., Cat., II., p. 350. Allp. MS. Macl., 336.

Most abundant off the South-east Coast, preying chiefly upon the shoals of Anchovies and Sprats. Caught with a jigger abundantly all the year round.

51. *THYRSITES MICROPUS*, M'Coy.

D. 17 : 4·12 : VI. A. 2·11 : IV. V. 1·1. P. 14.

C. 22 : 4·4.

M'Coy. Ann. and Mag. Nat. Hist., 1873, vol. XI., p. 338.

Macl. Cat., 337.

Prof. M'Coy terms this the "Tasmanian Kingfish," but this seems to be a mistake. The following species, *T. solandri*, is the common fish known by that name here. *T. micropus*, (M'Coy) must be extremely rare, as I have not yet met with a fish which agrees with the above characters.

52. *THYRSITES SOLANDRI*, Cuv. and Val. *The Kingfish* of Tasmania.**

D. 17 - 18 : 1·17 - 18 : I - II. A. 1·13 - 18 : II.

Günth. Cat., II., p. 352. Allp. MS. Macl. Cat., 338.

Migratory. Appear in immense numbers at certain seasons (December to June) in pursuit of the Horse Mackerel. Caught with a swivelled barbless hook, at night. Voracious in the extreme,—individuals frequently attacking each other, and also the allied species, the Barracouta.

The following five specimens, taken from a large number indiscriminately, give a fair notion of the variability of some of the characters of the species as found in Tasmanian waters :—

(1.) D. 18 : 1·17 : II. A. 1·16 : II. P. 14.

(2.) D. 18 : 1·17 : I. A. 1·15 : II. P. 14.

(3.) D. 18 : 1·17 : II. A. 1·13 : II. P. 14.

(4.) D. 18 : 1·17 : II. A. 1·14 : II. P. 14.

(5.) D. 18 : 1·7(3) : II. A. 1·14 : II. P. 15.

No. 5 has been deformed. The soft dorsal portion had received an injury at one time, and three abortive detached finlets have grown in place of the usual ten destroyed.

Full size (No. 2) about 38 to 40 inches long, and about 18 inches greatest girth. One of the most important food fishes of Tasmania.

Fam. XI. SCOMBRIDÆ (including the *Nomeidæ* and *Cyttidæ* of some authors).

53. GASTEROCHISMA MELAMPUS, Rich. (Z). *Butterfly Fish*.

B. 7. D. 17:1·10:VI. V. 1·5. H. 2·10:VI. P. 21.

L. lat. 64. L. tr. 27.

Günth. Cat., II., p. 387. Hutton, Cat., N.Z., p. 20.

The fish from which the above characters were taken was recently captured at the mouth of the estuary of the Derwent. Hitherto it has only been seen on rare occasions off the coast of New Zealand. The following are the principal dimensions:—Total length, 39 inches; length of body, 35 inches; length of head, $8\frac{3}{4}$ inches; length of snout, 4 inches; length of pectoral fin, $5\frac{1}{4}$ inches; length of anal fin, $5\frac{3}{4}$ inches (not reaching to vent as in Dr. Günther's figure; greatest depth, 9 inches; least depth, 1 inch; breadth of eye, $\frac{3}{4}$ inch; distance of extremity of maxillary from snout, 4 inches; distance of 1st ray of posterior dorsal from snout, $20\frac{1}{4}$ inches; distance of extremity of 1st ray of anal from snout, 23 inches. In the figure in Dr. Günther's "Study of Fishes," p. 455, the anterior dorsal spines exceed in length the 1st soft rays of dorsal and anal. In the mature specimen above described, the highest of the gently arched anterior dorsal spines are not so long as either the first longest soft ray of anal or dorsal, which are nearly equal.

54. SCOMBER AUSTRALASICUS, Cuv. and Val. *The English Mackerel*, or *Southern Mackerel*. **

D. 10:1·11:V. A. 1:1·11:V. L. lat., about 160.

Günth. Cat., II., p. 359. Allp. MS. Macl. Cat., 392.

I have not seen specimens, but the fishermen assure me that a fish called by them *The English Mackerel* is seen in immense shoals, after long irregular intervals of time, on the East Coast, followed, as in the case of the Horse Mackerel, by their rapacious enemies the Kingfish. Professor M'Coy (Zool. Vict., Dec., III., p. 43,) gives reasons for regarding the Hobson's Bay species,—which most probably may prove to be identical with the Tasmanian,—to be merely a variety of *Scomber pneumatophorus* (De la Roche), viz.—

D. 12:1·11:V. A. 1·12:V. P. 19. C. 17.

55. THYNNUS THYNNUS, L. (E). *The Tunny*.

D. 14:1·13:IX. A. 2·12:VIII. Vert. 16·23.

Günth. Cat., II., p. 362. Allp. MS.

Seen occasionally in the estuary of the Derwent. Have not examined any specimens.

56. NAUCRATES DUCTOR, L. (E). *The Pilot Fish*.

D. 3-6:1·26-28. A. 2·16-17. Cæc. pylor. 12-15.

Vert. 10-16.

Günth. Cat., II., p. 374. Allp. MS. Macl. Cat., 559.

Not uncommon in Tasmanian waters.

57. *ECHENEIS REMORA*, L. (E). *The Sucking Fish*.
D. 16 - 18 : 22 - 24. A. 25. Cæc. pylor. 6. Vert. 12 : 10.
Seen occasionally.
58. *ZEUS FABER*, L. (E). *John Dorey*.
D. 10 : 23. A. 4 : 22. V. 1 : 6.
Günth. Cat., II., 393. Allp. MS. Macl. (*australis*) Cat., 386.
I have not seen any specimens from Tasmanian waters. Fishermen usually designate the following species by the name "John Dorey," and hence the evidences given are very unsatisfactory.
59. *CYTUS AUSTRALIS*, Rich. (A.Z.) *The Bastard Dorey*.**
B. 8. D. 8 : 1 : 28 - 29. A. 2 : 30. P. 11. V. 1 : 6.
Günth. Cat., II., p. 396. Allp. MS. Macl. Cat., 387.
Abundant during the month of April in the estuaries of the Derwent and Tamar, but although a fine edible fish it is rarely captured, probably owing to the lack of the proper kind of net. Graball and seine-nets only are used by Tasmanian fishermen.

Fam. XII. CARANGIDÆ.

60. *TRACHURUS TRACHURUS*, Cuv. and Val. (A.Z.) *Horse Mackerel*.**
D. 8 : 1 : 32 - 35. A. 2 : 1 : 25 - 29. L. lat. 75 - 86.
Günth. Cat., II., p. 419. Allp. MS. Macl. Cat., 347.
Appear in immense shoals at times between January and June, and might with proper appliances become the source of a valuable industry. Their appearance in very large schools is an indication of the presence of the much prized Kingfish.
61. *CARANX GEORGIANUS*, Cuv. and Val. (A.) *The White or Silver Trevally*.**
D. 8 : 1 : 26 - 29. A. 2 : 1 : 22 - 24. L. lat. 20 - 25.
Günth. Cat., II., p. 440. Allp. MS. Macl. Cat., 350.
A valuable food fish. Immense numbers of the young have at times been captured in the estuaries during the autumn. The larger fish, 10 to 12 lbs. weight, are taken in deeper water.
62. *SERIOLA LALANDII*, Cuv. and Val. (A.) *Port Jackson Kingfish*.
D. 7 : 1 : 32 - 34. A. 2 : 1 : 20 - 21.
Günth. Cat. II., p. 463. Allp. MS. Macl. Cat., 365.
Doubtful. I have not seen any specimens. May have been mistaken for the following species.
63. *SERIOLA GRANDIS*, Cast. (A.) *Tasmanian Yellow-tail*.**
D. 6 : 1 : 32 - 35. A. 0 : 1 : 20. P. 21. V. 5.
Cast., Proc. Zool. Soc. Vic., vol. I., p. 115. Macl. Cat., 368.
Appear in schools; abundant off the George Town Heads regularly during a brief season (autumn) every year. Take bait greedily.

64. NEPTONEMUS BRAMA, Günth. (T.) *Snotgall Trevally.* **

D. 7 : 2-27 - 29. A. 2 : 1-22 - 23. L. lat. 88. L. tr. 16 : 25.

Günth. Cat. II., p. 390. Macl. Cat., 370.

The young are caught about the wharves at Hobart in abundance during the months of February, March, and April. They sometimes, in the mature state, reach a size of 2 ft. 6 in., and weigh from 12 to 14 lbs. (Barnett). The large fish do not ascend the upper shallow waters of estuaries.

65. NEPTONEMUS DOBULA, Günth. (T.) *Mackerel Trevally.* **

D. 7 : 1-37 - 40. A. 2 : 1-23. Vert. 24.

Günth., Pro. Zool. Soc. Lond., 1869, p. 429. Allp. MS.

Macl. Cat., 371.

This is a smaller and more elongate fish than the former ; is considered a greater delicacy for the table ; and rarely attains a length of 12 inches. Its habits are similar to the former species, but approaches the upper waters of estuaries seldomer and more irregularly.

66. NEPTONEMUS TRAVALE, Cast. *Port Jackson Snotgall.*

D. 6 : 2 - 30. A. 2 : 2-21. L. lat. 93.

Cast., Proc. Zool. Soc. Vic., vol. I., p. 119. Allp. MS.

Macl. Cat., 372. Tasmania (Allport).

Doubtful. I have not seen any specimens from Tasmanian waters.

67. TEMNODON SALTATOR, Bl. *Tailor or Skipjack.*

D. 8 : 1-24 - 26. A. 1 - 2 : 1-26 - 28. L. lat. 90 - 100.

L. tr. 8 : 19. Vert. 12 : 14.

Günth. Cat., II., p. 479. Allp. MS. Macl. Cat., 375.

An odd individual caught occasionally in the Derwent.

Fam. XIII. GOBIIDÆ.

68. GOBIUS TAMARENSIS, nov. sp.

B 4. D. 6 : 1-8. A. 1-8. L. lat. 32. P. 16 - 18.

C. 18 - 19.

Height of body seven times in total length, the length of head four times, and the greatest breadth behind orbits, six times. Head depressed ; eyes approximating towards top of head, looking upward and outward. Snout obtuse convex, one and a half times breadth of eye, and contained three and a half times in length of head ; interorbital space narrow, half the breadth of eye ; head and nape naked. Colour when alive, greyish. Body and vertical fins marbled with very fine reddish-brown dots. The extremities of the rays of second dorsal and anal fins blackish ; there are eleven scales between anal fin and 1st ray of 2nd dorsal ; caudal fin rounded ; dorsal and anal fin-rays one and a half times as long as snout—when stretched they do not reach caudal by a distance greater than their own length.

Enters the fresh water of the Tamar in great abundance. Two inches to two and three-fourth inches long.

This species approaches very close to *Gobius lateralis*, (Macleay.)

Fam. XIV. PEDICULATI.

69. BRACHIONICHTHYS HIRSUTUS, Lacep. *The Hand-fish.*

D. 1. 2 : 10 - 19. A. 9. P. 7. V. 1·4.

Günth. Cat., III., p. 182. Allp. MS. Macl. Cat., 430 - 431.

I am of opinion that *B. hirsutus* and *B. lævis* cannot be separated. *B. hirsutus* is very variable in colour, in the development of the minute spines on surface of skin, and in the number of soft rays of dorsal. The membrane connecting anterior spines is not connected with the first of the series, which is rather a species of tentacle than a spine. The tentacle is lax, hangs forward, and its lobe is really plumose in living specimens. Not uncommon in the estuary of the Derwent. Mrs. Meredith has very faithfully painted this species in her "Tasmanian Friends and Foes," under the name *B. politus*.

70. BRACHIONICHTHYS POLITUS, Rich. *The Red Hand-fish.*

D. 1 : 2 : 17. A. 9. P. 9. V. 1 : 4.

Rich., Voy. of *Ereb.* and *Ter.*, p. 16. Allp. MS. Macl. Cat., 432.

Rare. For reasons stated under the preceding species, it is not improbable that there may be individuals which may link the two species together.

Fam. XV. BLENNIDÆ.

71. BLENNIUS TASMANIANUS, Rich. *Blenny* or *Bully*.

B. 6. D. 12 : 17 - 18. A. 2·19. P. 14.

Günth. Cat., III., p. 214. Allp. MS. Macl. Cat., 545.
Common.72. SALARIAS MELEAGRIS, Cuv. and Val. *Blenny*.

D. 12 : 20. A. 22.

Günth. Cat., III., p. 256. Allp. MS. Macl. Cat., 562.
Common.73. CLINUS DESPICILLATUS, Rich. *Blenny*.

D. 3·35·4. A. 2·25. V. 1·3.

Günth. Cat., III., p. 271. Allp. MS. Macl. Cat., 572.
Common.74. CRISTICEPS AUSTRALIS, Cuv. and Val. *Blenny*.

D. 3·27 - 29·5 - 8. A. 2·23 - 25. V. 1·3. Vert. 15 : 31.

Günth. Cat., III., p. 275. Allp. MS. Macl. Cat., 580.
Common.75. CRISTICEPS FORSTERI, Cast. *Blenny*.

D. 3·29·4. A. 26. V. 1·3.

Cast. Proc. Zool. Soc. Vic., vol. I., p. 132. Allp. MS.
Macl. Cat., 588.

Common.

Fam. XVI. SPHYRÆNIDÆ.

76. LANIOPERCA MORDAX, Günth. *Tasmanian Jack or Pike*.
 D. 5 : 1·19. A. 2·25 - 29. P. 16. L. lat. 66.
 Günth. Ann. and Mag. Nat. Hist., 1872, vol. X., p. 183.
 Allp. MS. Macl. Cat., 608.
 Not uncommon in the Derwent.

Fam. XVII. ATHERINIDÆ.

77. ATHERINA PRESBYTEROIDES, Rich. *Silver Belly*.
 D. 9 : 10 - 11. A. 1·12. P. 11. Vert. 46.
 Günth. Cat., III., p. 397. Allp. MS. Macl. Cat., 397.
78. ATHERINA HEPSETOIDES, Rich. *Silver Belly*.
 D. 9 : 1·11. A. 1·14. P. 15. Vert. 48.
 Günth. Cat., III., p. 397. Allp. MS. (*hepsetus?*) Macl.
 Cat., 609.
 Port Arthur (Richardson).
79. ATHERINA HEPSETUS, L.
 Günth. Ann. and Mag. Nat. Hist., 1876, p. 396. Allp. MS.
80. ATHERINA MICROSTOMA, Günth. *Silver Belly*.
 D. 6 : 1·10. A. 1·12. P. 12. L. lat. 40. L. tr. 8.
 Günth. Cat., III., p. 401. Allp. MS. Macl. Cat., 614.
 Tasmania (Günther).
81. ATHERINA TAMARENSIS, nov. sp. *Silver Belly*.
 B. 7. D. 8 : 1·11. A. 1·10 - 11. V. 1·5. P. 13.
 L. lat. 42. L. tr. 9.
 Body somewhat compressed; cleft of mouth oblique. The
 origin of the first dorsal commences almost on a vertical
 line behind ventral. Eye relatively large, one-third the
 length of head, and slightly exceeding the length of
 snout. Scales cycloid, of moderate size. Three series of
 scales above silvery band which runs along the sides.
 Teeth minute.
 Abundant Launceston Bar, River Tamar.
82. ATHERENICHTHYS JACKSONIANA, Quoy and Gaim.
 D. 8·1 - 11. A. 1·18.
 Günth. Cat., III., p. 402. Allp. MS. Macl. Cat., 618.
 Tasmania (Allport; Günther).

Fam. XVIII. MUGILIDÆ.

83. MUGIL CEPHALOTUS, Cuv. and Val. *Sand Mullet*.**
 D. 4 : 1·8. A. 3·(7)8. L. lat. 38 - 40. L. tr. 14 - 15.
 Günth. Cat., III., p. 419. Allp. MS. Macl. Cat., 631.
 Common along the North-East Coast, George's Bay,
 Scamander River.

84. AGONOSTOMA FORSTERI, Bl. *Sea Mullet*.**

D. 4 : 1·10. A. 3·12. L. lat. 55. Cæc. pylor. 3.
Günth. Cat. III., p. 465. Allp. MS. Macl. (Diemensis)
Cat., 641.

Abundant in all the estuaries. Ascends the Tamar as far as
Launceston, and the Derwent above Bridgewater.

Fam. XIX. CENTRISCIDÆ.

85. CENTRISCUS SCOLOPAX, L. (E.) *The Bugler or Trumpet Fish*.

B. 4. D. 5 : 12. A. 20. P. 16. V. 5. C. 6 + 4 + 5 + 7.
Günth. Cat., III., p. 518. Allp. MS. Tasmania (Allport).
It is questionable whether the Tasmanian species may not
be *C. humerosus*, Rich. I have not yet examined any
local specimens.

Fam. XX. GOBIESOCIDÆ.

86. CREPIDOGASTER TASMANIENSIS, Günth.

B. 5. D. 10. A. 9.
Günth. Cat. III., p. 597. Allp. MS. Macl. Cat., 648.
Tasmania (Günther).

Fam. XXI. TRACHYPTERIDÆ.

87. REGALECUS GLADIUS, Cuv. and Val. (E.) *The Ribbon Fish*.

B. 6. D. 342. A. 0. C. 0. P. 14. V. 1.
Günth. Cat., III., p. 308. Allp. MS. Macl. Cat., 651.
Specimen examined, 14 feet long, captured at the Penguin,
Tasmania.

88. TRACHYPTERUS ALTIVELIS, Kner.

B. 6. D. 7 : 190. A. 0. C. 6 : 4 - 6. P. 11. V. 7.
Günth. Cat., III., p. 303.
Specimen in Royal Society's Museum, Hobart. Caught at
Spring Bay, on the East Coast of Tasmania.

Fam. XXII. HOPLGNATHIDÆ.

89. HOPLGNATHUS CONWAYII, Rich.

D. 12 : 12. A. 3·12.
Günth. Cat., III., p. 357. Allp. MS.
Tasmania (Allport.)

Fam. XXIII. LABRIDÆ.

90. COSSYPHUS GOULDII, Rich. *Blue Groper*.*

D. 11 : 11. A. 3·11. L. lat. 39. L. tr. 6 : 14.
Günth. Cat., IV., p. 111. Allp. MS. Macl. Cat., 693.
Common.

91. LABRICHTHYS BOTHRYOCOSMUS, Rich. *Parrot Fish*.*

D. 9 : 11. A. 3·10. L. lat. 27. L. tr. 3 : 9.
Günth. Cat., IV., p. 114. Allp. MS. Macl. Cat., 695.
Common. (See GEN. OBS.)

92. *LABRICHTHYS FUCICOLA*, Rich. (A.) *Parrot Fish*.
 B. 6. D. 9 : 11. A. 3·10. C. 14. P. 13. V. 1·5.
 L. lat. 27.
 Macl. Cat., 715.
 Tasmania (Macleay.) Colour dark plum purple, towards
 belly buff, with four pale spots on the back. (See GEN. OBS.)
93. *LABRICHTHYS PSITTACULA*, Rich. *Parrot Fish*.
 D. 9 : 11. A. 3·10. L. lat. 27. L. tr. 3·9. Vert. 9 : 16.
 Günth. Cat., IV., p. 114. Allp. MS. Macl. Cat., 696.
 Common. (See GEN. OBS.)
94. *LABRICHTHYS LATICLAVIUS*, Rich. *Parrot Fish*.
 D. 9 : 11. A. 3·10. L. lat. 26. L. tr. 3·9. Vert. 9·16.
 Günth. Cat., IV., p. 115. Allp. MS. Macl. Cat., 698.
 Common. (See GEN. OBS.)
95. *LABRICHTHYS TETRICA*, Rich. *Parrot Fish*.
 D. 9 : 11. A. 3·10. L. lat. 27. L. tr. 3·9.
 Günth. Cat., IV., p. 116. Allp. MS. Macl. Cat., 700.
 Common. (See GEN. OBS.)
96. *LABRICHTHYS CUVIERI*, Cast.
 D. 9 : 11. A. 3·10. L. lat. 27.
 Cast. Proc. Zool. Soc. Vic., vol. II., p. 53. Macl. Cat., 708.
 Hobart (Cast.)
 It may be well to state here that I consider the classification
 of the genus *Labrichthys* to be far from satisfactory. I
 have good reason to believe that dependence upon colour
 markings, however peculiar and brilliant, is to a great
 extent delusive. Like the genus *Monocanthus*, many
 of them change colour with age. There are none of the
 genus in much favour as food,—with the exception of
 the Blue-head.
97. *ODAX BALTEATUS*, Cuv. and Val. (A.) *The Ground Mullet*
of Fishermen.
 D. 15-17 : 12 - 13. A. 3·12 - 13. L. lat. 39. L. tr. 4 : 13.
 Vert. 19 : 17.
 Günth. Cat., IV., p. 240. Allp. MS. Macl. Cat., 751.
 Common. Entering fresh water occasionally. Derwent ;
 George's Bay.
98. *ODAX RICHARDSONI*, Günth. (A.) *The Stranger*.^{*}
 D. 17 : 13. A. 3·11 - 12. L. lat. 60. L. tr. 7 : 20.
 Günth. Cat. IV., p. 241. Allp. MS. Macl. Cat., 753.
 Caught occasionally in the Derwent.

Fam. XXIV. GADOPSIDÆ.

99. *GADOPSIS MARMORATUS*, Rich. (A.) *Freshwater Blackfish*.^{*}
 B. 6. D. 10 - 13 : 25 - 26. A. 3 : 18 - 19. V. 1.
 Günth. Cat., IV., p. 318. Allp. MS. Macl. Cat., 763.

Abundant Ringarooma, Forrester, the Piper, and other rivers of the north-east of Tasmania, where they grow to a considerable size, and are highly esteemed for food. The species has been introduced from the north-east into the North and South Esk Rivers, and probably other streams, where they are now abundant, and afford ample sport to the meditative angler who cares to linger over a calm still water-hole during the hours of the night season. The angler must be careful, however, to provide himself with a good bull's-eye lantern, or his labours will be fruitless.

Prof. M'Coy has minutely described two species,—viz., *G. gracilis*, Yarra River, and *G. gibbosus*, Bunyip River, Gippsland,—based upon a slight variation of relation of length of head to body, together with an equally slight variation in the number of dorsal spines and other characters, which are extremely inconstant in this variable form. Having closely studied the variability of the Tasmanian *G. marmoratus* I am unable to admit that the characters which distinguish *G. gracilis* and *G. gibbosus* are sufficient to separate them from Richardson's *G. marmoratus*, for the individual variations of the latter species in the North Esk and other rivers of Tasmania are greater than the differences which Prof. M'Coy considers sufficient to form distinct specific characters. In support of this I give the general characters of seven individuals now before me, taken together from a spot near Corra Lynn, on the North Esk. They fairly represent the individual variability:—

	B.	D.	A.	P.	L. lat.	L. tr.	Total Length.	Head.	Head in Total Length.
							inches.	inches.	times.
(1)	7	13 : 26	3·19	17	130 to 140.	18-20 : 48-55.	7 $\frac{3}{8}$	1 $\frac{3}{4}$	4·3
(2)	7	12 : 26	3·18	17			6 $\frac{1}{2}$	1 $\frac{1}{2}$	4·0
(3)	7	12 : 26	3·18	17			5 $\frac{1}{4}$	1 $\frac{3}{16}$	4·4
(4)	7	12 : 28	3·18	17			10 $\frac{3}{4}$	2 $\frac{1}{2}$	4·7
(5)	7	12 : 26	3·18	17			8	1 $\frac{5}{8}$	4·9
(6)	7	13 : 26	3·18	17			8 $\frac{1}{4}$	1 $\frac{7}{8}$	4·3
(7)	7	11 : 27	3·17	17			5 $\frac{3}{8}$	1 $\frac{3}{16}$	4·5

Thus the dorsal spines vary between 11 and 13, and the relation in length of head to total length from 4 to 4·9 times in the latter. These limits cover *G. marmoratus*, Rich.; *G. gracilis*, M'Coy; and *G. gibbosus*, M'Coy; and the other points described are equally variable within limits. I think it is clear, therefore, that the two last-named species cannot well be recognised. It is very hazardous in this genus to create a new species based upon the examination of only two or three individuals. It must be remembered also, that specimens in spirits would have the soft membrane bordering the flat opercular spine greatly contracted. This would affect the relative length of head and body.

Fam. XXV. GADIDÆ.

100. *LOTELLA SWANII*, nov. sp.

B. 7. D. 4 : 60. A. 55. V. 8. P. 22 - 23. L. lat. 200.

L. tr. 22 : 62.

Head contained $4\frac{1}{2}$ times in total length, and greatest depth $4\frac{1}{2}$ times. Length of snout equal to diameter of eye, and about one-fifth the length of head. Distance between orbits half again as broad as diameter of eye. There is a series of 8 to 11 irregular teeth in upper and lower jaws. Scales small. Colour uniformly dark brown. Not common.

The above form appears to be intermediate between *L. phycis*, Schleg.; and *L. callarius*, Günth. The differences are so marked, however, that I have thought it best to raise it into specific rank for the present. I am aware that there is a great variability in the allied genus *Pseudophycis*, and particularly in the common species known here as the Rock Cod (*P. barbatus*), Günth.; and when a larger number of individuals is examined it will be seen whether the limits of variability justify the separation or not. This is the species, probably, recorded in Mr. Allport's list as *L. phycis*.

Total length, 11 inches; length of body, 10 inches; length of head, $2\frac{1}{2}$ inches; length of snout, $\frac{1}{2}$ inch; length of barbel, $\frac{3}{4}$ inch; breadth interorbital space, $\frac{3}{4}$ inch; longest ventral ray, $1\frac{1}{2}$ inches; longest anterior dorsal ray, 1 inch (3rd and 4th); longest posterior dorsal ray, $\frac{3}{4}$ inch; longest anal ray, $\frac{3}{4}$ inch; greatest depth of body, $2\frac{3}{8}$ inches; least at caudal peduncle, $\frac{6}{8}$ inch; snout to termination of first dorsal, $9\frac{1}{4}$ inches; snout to termination of anal, $9\frac{1}{2}$ inches; snout to first ray of anterior dorsal, $2\frac{3}{4}$ inches.

101. *PSEUDOPHYCIS BARBATUS*, Günth. *The Common Rock Cod*.**

D. 9 - 11 : 48 - 57. A. 44 - 57. V. 5. L. lat. 100 - 140.

P. 22 - 26. C. 28 - 29.

Ann. Mag. Nat. Hist., 1863, p. 116. Macl. Cat., 769.

M'Coy, Zool. of Vict., Dec., II., p. 29.

Common all the year round on all our coasts, and entering the shallow banks of estuaries in immense numbers during the winter months, when they are caught in very large numbers by amateur fishermen with hook and line. The young also appear in these shallows in very large numbers during the months of April and May. The Rock Cod, although somewhat soft, is held in great esteem as an article of food. The local variety agrees with the limits described by Prof. M'Coy, is equally variable, but it appears to present a local difference in the average size of scale. The Derwent Rock Cod rarely has more than 100 rows of scales along the lateral line. In all other respects it agrees with Prof. M'Coy's description already referred to. Mr. Allport has *P. bacchus* in his MS. list; but, as *P. barbatus* is not referred to, I am convinced that the latter was mistaken for the former. I have never seen a representative of *P. bacchus* in Tasmanian waters.

Fam. XXVI. OPHIDIIDÆ.

102. *GENYPTERUS AUSTRALIS*, Cast. *The Ling*.**
 B. 7. D. 159. A. 123 - 126. P. 19. L. lat. 261 - 307.
 Cast. Proc. Zool. Soc. Vic., vol. I., p. 164. Mac. Cat., 731.
 M'Coy, Zool. of Vic., Dec., III., p. 37.
 Common occasionally in market. Highly esteemed as food.
 Prof. M'Coy is of opinion that the *G. Australis* may not
 be distinct from *G. blacodes*, Forst.
103. *FIERASFER HOMEI*, Rich.
 B. 7. Vertical fins continuous, very low.
 Günth Cat., IV., p. 382. Macl. Cat., 774. Allp. MS.
 Rare. I have not seen any specimens. Tasmania (Rich.)

Fam. XXVII. MACRURIDÆ.

104. *MACRURUS AUSTRALIS*, Rich. (A.)
 D. 13·88. A. 87. V. 7. L. lat. 130. L. tr. 4 : 15.
 V. 14 : 53.
 Günth. Cat., IV., p. 391. Allp. MS. Macl. Cat., 776.
 Captured occasionally in the Derwent.

Fam. XXVIII. PLEURONECTIDÆ.

105. *AMNOTRETIS ROSTRATUS*, Günth. (T.) *The Sole of Fishermen*.**
 B. 7. D. 79 - 81. V. dext. 6 - 7, sin. 4. L. lat. 89 - 90.
 Günth. Cat., IV., p. 458. Allp. MS. Macl. Cat., 784.
 Common in the upper shallows of estuaries. Valuable market
 fish. Taken in graball. Does not take bait.
106. *RHOMBSOLEA MONOPUS*, Günth. (A.) *The Common Flounder*.**
 B. 5. D. 59 - 60. V. 6. A. 42 - 43.
 Günth. Cat., IV., p. 459. Allp. MS. Macl. Cat., 785.
 Abundant in the upper shallows of estuaries. Taken in nets.
 Does not take bait.
107. *RHOMBSOLEA TAPIRINA*, Günth. (A.) *Flounder*.**
 B. 6 - 7. D. 64 - 66. A. 46 - 50.
 Günth. Cat., IV., p. 459. Allp. MS. Macl. Cat., 786.
 Common, but not so often seen in market as the two pre-
 ceding species.
108. *SOLEA LITURATA*, Rich. (T.)
 Rich. Trans. Zool. Soc., III., p. 156. Tasmania (Rich.)
 I have not seen the description, and I doubt the existence
 of this genus in Tasmanian waters.

Fam. XXIX. HAPLOCHITONIDÆ.

109. *PROTOTROCTES MARÆNA*, Günth. (A.) *The Freshwater Herring or Cucumber Fish*.**
 B. 6. D. 10. A. 19. P. 13. L. lat. 78. L. tr. 19.
 Günth. Cat., V., p. 382. Allp. MS. Macl. Cat., 824.

Abundant in all our principal rivers. Affords the finest sport of all our fishes to anglers. It is very much esteemed as a delicious table fish. Unfortunately, the introduction of the English Brown Trout (*Salmo fario* var. *Ausonii*) into many of our rivers threatens the extinction of this most valuable native fish. Sometimes reaches 12 to 13 inches long.

110. HAPLOCHITON SEALII, nov. sp. *The Derwent Smelt.*

B. 6. D. 8-9. A. 19-20. V. 7. P. 9-12. Vert. 56-57.

Body naked. Total length, 5.3 times length of head, and nearly 10 times the height of the body. Head somewhat broad, depressed; interorbital space wide. Teeth in a single series, small, hooked, on maxillary and mandible,—minute on palate. Eye relatively large, diameter equal to length of snout, which latter is contained in head 3.2 times. Maxillary extending to a vertical line drawn through centre of eye; posterior end slightly enlarged, and curved downwards. Lower jaw slightly longer. Dorsal situated rather in advance of vent and behind ventral fin. Belly rounded. Adipose fin, membranous, rudimentary, broadly deltoid. Body ornamented with extremely minute dots; from the ventrals forward these minute blackish dots invariably form two parallel interrupted lines which ultimately gradually approach and unite at an acute angle under the mandibles. Silvery band along sides. This interesting species has the same migratory habit as *Retropinna Richardsoni*, Günth. It appears in the upper waters of the Derwent, near New Norfolk, in large shoals during the months of October and November. The females are then full of mature ova, which are comparatively large when compared with the size of the fish. The introduced English Salmonoids appear to prey upon these little fish to a great extent. When chased, the little fish may be seen leaping in scores from the surface of the water.

Average length, mature, $1\frac{1}{2}$ to 2 inches.

Fam. XXX. SCOPELIDÆ.

111. ALEPIDOSAURUS FEROX, Lowe.

B. 6-7. D. 41-44. A. 14-17. P. 14-15. V. 9-10.

Günth. Cat., V., p. 421. Allp. MS. Macl. Cat., 837.

Tasmania (Rich).

I have not seen any specimens.

Fam. XXXI. SALMONIDÆ.

112. RETROPINNA RICHARDSONI, Gill. (A.Z.) *Whitebait* or *Smelt*.**

B. 6. D. 11-12. A. 17-20. P. 11. V. 6. L. lat. 61.

Günth. Cat., VI., p. 171. Macl. Cat., 840.

Captured in great abundance in the River Tamar, in the prawn nets, during the months of February and March, together with a species of *Atherina*, and *Galaxius attenuatus*, and are generally termed by fishermen, *Whitebait*. Dr. Günther had formerly supposed that this species

was confined to New Zealand; it appears, however, to be common to Australia and Tasmania. These little fishes are much esteemed as food for the breakfast table.

113. *SALMO SALAR*, L. (I.) *The English Salmon*.**

B. 11-12. D. 14. A. 11. P. 14. V. 9. L. lat. 120. L. tr. 22-26 : 19-22. Vert. 59-60. Cæc. pyl. 53-77.

Günth. Cat., VI., p. 13. Allport, Report Roy. Soc. Tas., Proc. 1866.

Shipment of ova arrived successfully by the *Norfolk*, which was safely delivered at the Salmon Ponds, Tasmania, on 21st April, 1864. Of this shipment at least about 500 fishes were successfully hatched and liberated in the Plenty. Some were retained in the Ponds for breeding purposes. The doubt whether the true *S. salar* has established itself in our waters is not yet set at rest, for no fish over 10 lbs. of a migratory form has yet been caught in the Derwent after the lapse of 18 years. The migratory type now successfully established seems to partake of a character intermediate between *S. trutta*, *S. Cambricus*, and *S. salar*. Many specimens examined by me, caught in the Derwent, agree with the grilse form of *S. salar* in nearly every characteristic, saving the relative length of maxillary bone as compared with snout. The snout is invariably somewhat obtuse, as in *S. trutta*, although in all other respects many individuals agree more closely with its noble congener, *S. salar*, than with the other two mentioned species. (See GEN. OBS.)

114. *SALMO TRUTTA*, Flem. (I.) *English Sea Trout or Salmon Trout*.**

B. 11. D. 13. A. 11. P. 15. V. 9. L. lat. 120. L. tr. 24-26 : 36-34. Vert. 59-60. Cæc. pylor. 49-61, rarely less.

Günth. Cat., VI., p. 24; Allport's Report, Proc. Roy. Soc. Tas., 1866.

Ova introduced successfully by the *Lincolnshire* in the year 1866. As already pointed out with reference to *S. salar*, it is difficult to say whether the form resembling the above species, now abundant in the Derwent, is, properly speaking, *S. trutta* or not. It is in many respects more allied to *S. Cambricus*.

The following are the average limits of the common form:—B. 10-12. D. 13-14. A. 11-12. P. 14. V. 9. L. lat. 120. Cæc. pylor. 42-67. Maxillary, relative to snout, longer and thin; transverse series of scales from adipose fin forward to lateral line, 12-14; depth of operculum relative to length, $1\frac{1}{2}$ to $1\frac{1}{3}$; hind part of body moderately elongate; vomerine teeth disappearing in specimens from 3 to 5 lbs. weight; caudal fin invariably emarginate in full grown specimens; colour usually bluish-black on back and shoulders, silvery on sides; pair markings, 11 to 12 bars, frequently seen in smolt stage.

Whether this local form is the result of hybridism, as suggested by Dr. Günther, or is simply the effects of the differing conditions of a new environment, I am as yet

unable to decide,—perhaps a good deal may be due to both influences. It is noteworthy, however, that already in New Zealand and Tasmania the allied species *S. fario*, var. *Ausonii*, has developed into types which are peculiarly characteristic of particular local streams. This variability in relation to environment is very suggestive, and may yet help to explain the trifling variable differences in character, often overlapping, between *S. Cambricus*, *S. gallivensis*, *S. brachypoma*, and *S. trutta* of Scotch, English, and Irish streams.

I have already pointed out (*Mercury*, Hobart, Nov. 25, 1879,) that characters which may be greatly affected by environment are not to be depended upon, and, in the opinion of some authorities in other branches of natural history, such differences would not be recognised as of specific or even sub-specific rank. The assumption of hybridism is to me extremely unsatisfactory, for the reason that the extreme types steadily perpetuate themselves in European waters notwithstanding the extraordinary facilities among fishes for intercrossing by natural means which probably have existed unrestricted for ages.

115. *SALMO FARIO*, var. *Ausonii*, L. (1.) *English Brown Trout*.**
D. 13 - 14. A. 10 - 11. P. 13. V. 9. L. lat. 120. L. tr.
26 : 30. Cæc. pylor. 38 - 51. Vert. 57 - 58.

Günth. Cat., VI., p. 64. Allp. Rep. Pro. Roy. Soc. Tas., 1866.

Ova introduced successfully, together with the former species, per the *Lincolnshire*, in the year 1866.

The species now abound in all the principal rivers of Tasmania, and sometimes reach the enormous weight of 28 lbs., and a length of three feet. The new conditions in our rivers appear to have greatly modified their general form and character. The following limits of variability show that the old limits of characters are not of much value here :—B. 9 - 12. D. 13 - 14. A. 10 - 11. P. 13 - 16. V. 9. L. lat. 120. Pylor. cæc. 41 - 72. Maxillary strong and, relative to snout, generally much longer; hind part of body generally short and high; vomerine teeth in specimens 3 to 5 lbs. weight generally disappearing; caudal fin generally emarginate, not truncate. Colour varying with the nature of the bottom and the country through which the stream passes. They are generally coarse and dark where the streams are choked with heavy dead timber, as in some places in the River Meander; silvery in gravelly bottoms and open country, as at Simmons' Plains; and especially so those which have formed the habit of entering the brackish water about the wharves in Launceston.

Fam. XXXII. GALAXIDÆ.

116. *GALAXIAS TRUTTACEUS*, Cuv. & Val. (T.) *Spotted Trout*.**
B. 9. D. 11. A. 14 - 15. V. 7. P. 14.

Günth. Cat., VI., p. 209. Allp. MS. Macl. Cat., 841.

Abundant in most of our freshwater streams, but not descending to brackish water like *G. attenuatus*.

There are two or three varieties :—

Var. *a*.—In the North Esk, without the three characteristic cross-bars upon shoulder.

Var. *b*, Mountain Trout.—Without spots or bars; head more depressed: Colour, grey, with beautiful iridescent specks of green and gold. Mount Wellington.

Var. *c*.—A red-finned variety, found in streams at Gould's Country.

Although not large they are highly prized for the table, and often afford sport to the angler.

117. *GALAXIAS AURATUS*, nov. sp. *Lake Trout*.**

B. 9. D. 11 - 12. A. 14. P. 16. V. 1·7.

The height of the body is contained five times in the total length; the length of head nearly four times. The head is very much depressed. Interorbital space wide, having three pairs of pores over each eye. About seventy distinct pores, mostly in pairs, along usual course of lateral line. Head blackish. Body of a bright transparent golden hue. Spots very large, rounded, and sometimes confluent above lateral line. No blackish bars across shoulder. Ventrals tipped with black; base and tips of anal and dorsal blackish. Pectoral reaches to half the distance from root of ventral. Total length, $9\frac{3}{4}$ in.; body, $8\frac{1}{2}$ in.; head, $2\frac{1}{2}$ in.; snout, $\frac{3}{4}$ in.; depth, 2 in. nearly; interorbital space, 1 in. nearly. This species is confined to the neighbourhood of the Great Lake, at an altitude of about 4000 feet. It attains a larger size than any other member of the genus.

118. *GALAXIAS ATTENUATUS*, Jenyns. (A.Z.) *The Jolly-tail*.**

D. 12. A. 16. P. 12. V. 7.

Günth. Cat., VI., p. 211. Allp. MS. Maccl. Cat., 844.

Abundant in all freshwater streams, entering brackish water in vast numbers. Are highly esteemed as a delicacy for the table.

119. *GALAXIAS WEEDONI*, nov. sp. *Mersey Jolly-tail*.*

D. 11. A. 14. P. 15.

Body somewhat compressed. Length of head scarcely exceeding the depth of body, and contained four and a half times in the total length. Pectoral reaches half the distance to root of ventral. Head and body brownish black; back and sides marbled with irregularly transverse wedge-shaped streaks, and bands of darker hue. Caudal bifurcate.

Length, $4\frac{1}{2}$ inches. Mersey River. The finer head and more compressed form, together with marbled sides, distinguish this species from its closely allied congener.

120. *GALAXIAS ATKINSONI*, nov. sp. *Pieman Jolly-tail*.*

B. 9. D. 11. P. 13. A. 14. V. 8.

Length four and one-third times that of the head, and the latter is equal to one and a half times the height of body. Diameter of eye equal to length of snout, and about one-fourth the length of head. Length of pectoral more than

one-half the distance to the root of ventral. The depth of peduncle is not half as long as the distance between caudal and dorsal fins. Colour darkish brown. Sides with sixteen to eighteen regular transverse bands of a deeper shade composed of microscopic dots. These bands are less defined towards tail, and are rather wider than the interspaces. Larger dots are distributed along the lines of vertebræ and ribs. Specimen $2\frac{1}{2}$ inches long. Pieman River (Atkinson).

Fam. XXXIII. SCOMBRESOCIDÆ.

121. *HEMIRHAMPHUS INTERMEDIUS*, Cant. (A.Z.) *The Garfish*.**

D. 15 - 17. A. 18 - 20. P. 11.

Günth. Cat., VI., p. 260. Allp. MS. Macl. Cat., 867.

Abundant during the summer months, and caught largely in seine-nets in our estuaries. They are valuable market fish, although it is to be regretted that their mode of capture by the seine-net appears to commit great havoc among the young of other valuable food fishes.

Fam. XXXIV. CYPRINIDÆ.

122. *CARASSIUS VULGARIS*, Nilsson. (I.) *The European Carp*.
 123. *CARASSIUS AURATUS*, L. (I.) *Gold Fish*.
 124. *TINCA VULGARIS*, Cuv. (I.) *English Tench*.

Fam. XXXV. GONORHYNCHIDÆ.

125. *GONORHYNCHUS GREYI*, Rich. (A.Z.) *Sand Eel*. *

B. 4. D. 11 - 13. A. 9. V. 9. Cæc. pylor. 6 - 9.

Günth. Cat., VII., p. 373. Allp. MS. Macl. Cat., 883.

Not uncommon in the Derwent.

Fam. XXXVI. CLUPEIDÆ.

126. *ENGRAULIS ENCRASICHOLUS* (*var. antipodum*), L.
The Anchovy.*

B. 12 - 13. D. 16 - 17. A. 18 - 20. L. lat. 48 - 50.

Vert. 46 - 47.

Günth. Cat., VII., p. 385. Allp. MS. Macl. Cat., 885.
 (*Antarticus*.)

Abundant; frequently entering rivers Derwent, Tamar, and Huon.

It is surprising that no effort has been made locally to utilise this valuable fish. Fishermen can have no interest in attempting to capture the shoals seen frequently by them towards the mouth of the Derwent, so long as there is an absence of proper curing establishments. Hobart is very favourably situated as a centre for a fishing industry of this kind.

127. *CLUPEA SPRATTUS*, L. (E.) *The Sprat*.*

B. 6 - 7. D. 15 - 18. A. 17 - 20. V. 7. L. lat. 47 - 48.
Vert. 47 - 49.

Günth. Cat., VII., p. 419. Proc. Zool. Soc., 1871, p. 672.
Allp. MS. Macl. Cat., 899.

Large shoals of these fish are observed by the fishermen to pass along the coasts at certain seasons, attended usually by their rapacious enemies, the Barracouta and Kingfish. Small numbers ascend the Tamar as far as Launceston during March each year. Sometimes the main body mistakes its course, as in 1844, when the Sprats entered the Derwent in immense numbers. The late Mr. Calder gave a description of an immense shoal which had been driven ashore and suffocated, in Simmons' Cove, Bruni Island, in 1867 (Proc. Roy. Soc. Tas., May, 1867). In speaking of the mass of fish thus destroyed at one time, he estimated that there was not less than three hundred tons, which he reckoned would amount to forty-three million eight thousand individual fishes. Dr. Günther, in quoting this instance, urges that "attempts ought to be made to utilise the Tasmanian Anchovy and Sprat in the same way as it is done in Europe." The Sprat does not seem to visit the Australian coasts.

128. *CLUPEA SAGAX*, Jenyns. *The Pilchard*. (A.)

B. 7. D. 18. A. 18 - 19. L. lat. 50 - 54. L. tr. 13.

A series of more or less distinct blackish spots along the side.

Günth. Cat., VII., p. 443. Allp. MS. Macl. Cat., 890.

Not so common as the sprat. Tasmania (Allport).

Fam. XXXVII. SYMBRANCHIDÆ.

129. *CHILOBRANCHUS DORSALIS*, Rich. (A.)

Paired fins none. Vertical fins rudimentary. Colour blackish brown, with a median dorsal line.

Günth. Cat., VII., p. 18. Allp. MS. Macl. Cat., 908.

Tasmanian specimens 90 mil. long. (Gunn and Günther.)

130. *CHILOBRANCHUS RUFUS*, Macleay. (A.)

Colour red, with six or seven blue or dark purple spots along each side. Length three inches.

Macl. Cat., 909. Tasmania (Macleay).

Fam. XXXVIII. MURÆNIDÆ.

131. *ANGUILLA AUSTRALIS*, Rich. (A.) *The Common Eel*.**

Dorsal fin begins at a short distance in advance of anal.

Günth. Cat. VIII., p. 36. Allp. MS. Macl. Cat., 913.

Abundant in all rivers. Reaches to an immense size in the South Esk River.

132. *CONGER VULGARIS*, Cuv. *The Common Conger Eel*.**

Dorsal fin begins nearly opposite to extremity of pectoral fin.

Günth. Cat., VIII., p. 38. Allp. MS. Macl. Cat., 913.

Brought to Hobart market in considerable quantities.

133. CONGER WILSONI, Cast. *Conger Eel*.
Dorsal fin commences behind the extremity of pectoral fin.
Cast., Proc. Zool. Soc. Vic., vol. I., p. 193. Macl. Cat., 914.
Tasmania (Cast).
134. MURÆNICHTHYS BREVICEPS, Günth.
Origin of dorsal twice as distant from vent as from gill-opening.
Günth. Ann. and Mag. Nat. Hist., 1876, v. XVII., p. 401.
Allp. MS. Macl. Cat., 922.
Rare. Tasmania (Allport).
135. CONGROMURÆNA HABENATA, Rich. (A. Z.) *Silver Eel*.
Upper jaw much projecting beyond lower. Dorsal commences immediately behind the pectoral.
Günth. Cat., VIII., p. 42. Macl. Cat., 916.
Rare. One specimen in Roy. Soc. Museum, caught in the Derwent.

Fam. XXXIX. PEGASIDÆ.

136. PEGASUS LANCIFER, Kaup.
D. 5. A. 5. P. 15. V. 2.
Günth. Cat., VIII., p. 149. Allp. MS. Macl. Cat., 946.
Not uncommon in the Derwent.

Fam. XL. SYNGNATHIDÆ.

137. SYNGNATHUS SEMIFASCIATUS, Günth. (A.) *Pipe Fish*.
D. 38. Osseous rings, 21 + 49.
Günth. Cat., VIII., p. 162. Allp. MS. Macl. Cat., 947.
Not uncommon.
138. STIGMATOPHORA ARGUS, Rich. (A.) *Pipe Fish*.
D. 49 - 52. Osseous rings, 20 + about 75.
Günth. Cat., VIII., p. 189. Allp. MS. Macl. Cat., 965.
Common.
139. STIGMATOPHORA NIGRA, Kaup. (A.) *Pipe Fish*.
D. 39 - 40. Osseous rings, 17 + about 72.
Günth. Cat., VIII., p. 190. Macl. Cat., 966.
Enters the Tamar occasionally.
140. STIGMATOPHORA GRACILIS, Macleay. (T.) *Pipe Fish*.
D. 58. Osseous rings, 20 + 56.
Macl. Cat., 970. Length, 5 inches. Tasmania (Macleay).
141. SOLENOGNATHUS SPINOSISSIMUS, Günth. *Pipe Fish*.
D. 35. Osseous rings, 27 + 55.
Günth. Cat., VIII., p. 195. Allp. MS. Macl. Cat., 973.
Common, Derwent.
142. PHYLLOPTERYX FOLIATUS, Shaw. (A.)
D. 30. Osseous rings, 18 + 35.
Günth. Cat., VIII., p. 196. Allp. MS. Macl., 974.
Common.

143. *HIPPOCAMPUS ABDOMINALIS*, Kaup. (T.) *Sea-horse*.
D. 28 - 31.
Günth. Cat., VIII., p. 199. Allp. MS. Macl. Cat., 978.
Abundant.
144. *HIPPOCAMPUS BREVICEPS*, Peters. *Yellow-ringed Sea-horse*.
D. 19 - 21, standing on five rings.
Günth. Cat., VIII., p. 200. Allp. MS. Macl. Cat., 980.
Common.

Fam. XLI. SCLERODERMI.

145. *MONOCANTHUS GUNNII*, Günth. *Dark Brown Leather-jacket*.
D. 34. A. 33. Skin velvety, dark brown, mottled with black.
Günth. Cat., VIII., p. 247. Allp. MS. Macl. Cat., 993.
Common.
146. *MONOCANTHUS CONVEXIROSTRIS*, Günth. *Grey Leather-jacket*.
D. 34 - 37. A. 32 - 35. Small spiny distinct scales.
Günth. Cat., XIII., p. 248. Allp. MS. Macl. Cat., 994.
Common.
147. *MONOCANTHUS PERONII*, Holland. *Pale brown Leather-jacket*.
D. 33 - 35. A. 33. Scales spine-like, with swollen tips like a mushroom.
Günth. Cat., VIII., p. 249. Allp. MS. Macl. Cat., 997.
(Güntheri?).
Common.
148. *MONOCANTHUS GUNTHERI*, Macleay, (M. Peronii, Holland).
Macl. Cat., 998.
149. *MONOCANTHUS SPILOMELANURUS*, Quoy & Gaim. (A.)
Golden-streaked Eye Leather-jacket.
D. 30 - 32. A. 28 - 32.
Günth. Cat., VIII., p. 250. Allp. MS. Macl. Cat., 1000.
Common, Sandy Bay.
150. *MONOCANTHUS MACULOSUS*, Rich. (A.) *Small brown Leather-jacket*.
D. 29 - 33. A. 29 - 30. P. 12.
Günth. Cat., VIII., p. 25. Allp. MS. Macl. Cat., 1001.
151. *MONOCANTHUS BAUDINI*, Cast. (A) *Lozenge-scaled Leather-jacket*.
D. 35. A. 31. P. 13. C. 8. Scales lozenge-shaped, each armed with three or four spinelets.
Proc. Zool. Soc. Vic., Vol. II., page 55. Macl. Cat., 1007.
Tasmania (Cast).

152. *MONOCANTHUS MELAS*, Günth. *Black Leather-jacket*.
 D. 34. A. 34. Colour brownish black; two whitish bands
 across chin.
 Günth. Ann. and Mag. Nat. Hist., 1876, vol. XVII., p. 402.
 Allp. MS. Macl. Cat., 1014.
 Tasmania (Allport).
153. *MONOCANTHUS RUDIS*, Rich. *White-banded Leather-jacket*.
 D. 34 - 35. A. 34. Brown, uniform or with four indistinct
 broad, whitish, longitudinal bands.
 Günth. Cat., VIII., p. 244. Allp. MS. Macl. Cat., 1020.
 Common.
154. *MONOCANTHUS HIPPOCREPIS*, Quoy and Gaim. *Blue-
 banded Leather-jacket*.
 D. 35 - 37. A. 33 - 36. Brown, with undulated bluish bands
 on the snout and along the lower side.
 Günth. Cat., VIII., p. 246. Allp. MS. Macl. Cat., 992.
155. *OSTRACION AURITUS*, Shaw. *Trunk-fish*.
 Spines, 1 above hind part of orbit, pointing backward.
 Günth. Cat., VIII., p. 266. Allp. MS. Macl. Cat., 1036.
 Common.
156. *OSTRACION ORNATUS*, Gray. *Yellow-striped Trunk-fish*.
 Spine, 1 above middle of orbit, nearly erect, pointing up
 and out.
 Günth. Cat., VIII., p. 267. Allp. MS. Macl. Cat., 1037.
 Common.

Fam. XLII. GYMNODONTES.

157. *TETRODON HAMILTONI*, Rich. *Toad Fish*.
 Back and abdomen covered with minute spines; back and
 sides marbled with roundish dark brown blotches.
 Günth. Cat., VIII., p. 280. Allp. MS. Macl. Cat., 1045.
 Common. This globe-fish is stated to be highly poisonous
 taken as food. It is abundant, entering fresh water at
 Cataract Bridge on the Tamar.
158. *TETRODON RICHEL*, Freminv. *Globe Fish*.
 Body densely covered with minute spines; light brown
 above, lower parts uniform white.
 Günth. Cat., VIII., p. 285. Allp. MS. Macl. Cat., 1046.
 Common in all our estuaries. They inflate their bodies and
 emit singular sounds when being captured. When inflated
 the belly floats uppermost.
159. *CHILOMYCTERUS JACULIFERUS*, Cuv. (A.) *Porcupine Fish*.
 D. 16. A. 15. P. 19. C. 9.
 Three black spots on each side of the body; jaws without
 median suture; only 5 spines, in a straight longitudinal
 series from parietal spine to side of dorsal fin.
 Günth. Cat., VIII., p. 313. Macl. Cat., 1063.
 Common.

160. *ATOPOMYCTERUS NYCHTHEMERUS*, Cuv. *Slender-spined Porcupine Fish.*

All the spines slender, without ridge; upper part of tail without spine; snout to dorsal, 13 spines in transverse series. Günth. Cat., VIII., p. 315. Allp. MS. Macl. Cat., 1065.

161. *ORTHAGORISCUS MOLA*, L. *Sun Fish.*

D. 17 - 18. A. 14 - 17. C. 12 - 16. P. 12 - 13. Vert. 10 - 7. Günth. Cat. VIII., p. 317. Allp. MS. Macl. Cat., 1066. Captured occasionally.

SUB-CLASS II. *Chondropterygii.*

Fam. XLIII. *CHIMÆRIDÆ.*

162. *CALLORHYNCHUS ANTARTICUS*, Lacep. *The Elephant Fish.*
Snout with a cartilaginous prominence terminating in a cutaneous flap.

Günth. Cat., VIII., p. 351. Allp. MS. Macl. Cat., 1070. Common in the estuaries of the Derwent and Tamar.

Fam. XLIV. *CARCHARIDÆ.*

(Eye with a nictitating membrane, an anal fin, two dorsals.)

163. *CARCHARIAS GLAUCUS*, L. (E.) *The Blue Shark.*

An anal fin. Teeth serrated, those of upper jaw oblique. First dorsal opposite to space between pectoral and ventral fins. Without spine. Mouth inferior.

Günth. Cat., VIII., p. 353. Allp. MS. Macl. Cat., 1074. Common.

164. *GALEUS CANIS*, Rondel. (E.) *The Tope.*

Teeth, 34 : 34. The second dorsal fin is only one-third of the size of the first, and somewhat in advance of anal.

Günth. Cat., VIII., 379. Allp. MS. Macl. Cat., 1079.
(*Australis.*)

Mr. Macleay is of opinion that the Australian form is specifically distinct from the European form. It is termed the "School Shark" by the Port Jackson fishermen. Length about six feet.

165. *ZYGÆNA MALLEUS*, Shaw. (E.) *The Hammer-headed Shark.*

The length of the hinder margin of one side of the hammer is nearly equal to its width near the eye.

Günth. Cat., VIII., p. 381. Allp. MS. Macl. Cat., 1080.

166. *MUSTELUS ANTARTICUS*, Günth. (A.)

Origin of dorsal fin behind the inner posterior angle of pectoral. No spine. Teeth small, numerous, similar in both jaws, arranged like pavement, obtuse or with very indistinct cusps.

Günth. Cat., VIII., p. 387. Allp. MS. Macl. Cat., 1081. Common.

Fam. XLV. LAMNIDÆ.

(No nictitating membrane. An anal fin. Two dorsals, the first opposite to the space between pectorals and ventrals. Nostrils not confluent with the mouth, which is inferior. Spiracles none, or minute.)

167. *LAMNA CORNUBICA*, Flem. *Porbeagle* or *Blue Shark*.
Teeth 13 - 16 : 12 - 14. Lanceolate, not serrated. Third tooth either side upper jaw small.
Günth. Cat., VIII., p. 389. Allp. MS. Tasmania (Allport.)
168. *ODONTASPIS AMERICANUS*, Mitch. (A.) *The Grey Nurse*.
Teeth large, awl-shaped, with small additional basal cusps.
Günth. Cat., VIII., p. 392. Allp. MS. Macl. Cat., 1084.
Not uncommon. Length, 10 feet.
169. *ALOPECIAS VULPES*, L.
Teeth of moderate size, triangular, not serrated. Third tooth upper jaw smallest.
Günth. Cat., VIII., p. 393. Allp. MS. Macl. Cat., 1085.
Tasmania (Allport). Length, seven feet.

Fam. XLVI. NOTIDANIDÆ.

170. *NOTIDANUS INDICUS*, Cuv.
One dorsal fin only, without spine, opposite to the anal. A single median pointed tooth in upper jaw. Lower tooth with lateral cusps only.
Günth. Cat., VIII., p. 398. Allp. MS. Macl. Cat., 1086.
Tasmania (Allport). Length, five feet.

Fam. XLVII. SCYLLIDÆ.

(No nictitating membrane. The first dorsal fin above or below the ventrals. An anal fin. Mouth inferior. Teeth small, several series being generally in function.)

171. *SCYLLIUM MACULATUM*, Bl.
Teeth of the lower jaw of moderate size, with a long median cusp, and a pair of small cusps on each side. Brownish above and below, with scattered brown spots. Nasal valves confluent.
Günth. Cat., VIII., p. 401. Macl. Cat., 1087.
Length, two feet. Doubtful.
172. *SCYLLIUM LATICEPS*, Dum.
Teeth very small tricuspid. Nasal valves not confluent, separated by a broad interspace. Brownish, marbled with darker.
Günth. Cat., VIII., p. 404. Allp. MS. Macl. Cat., 1088.
Tasmania (Allport).
173. *PARASYLLIUM VARIOLATUM*, Dum.
Teeth small lanceolate, only those of lower jaw with indistinct lateral cusps. The two dorsal fins subequal, the first distant from root of ventral. Anal entirely in advance of

second dorsal. Dark brown above, with more or less distinct black spots.

Günth. Cat., VIII., p. 410. Allp. MS. Macl. Cat.

Tasmania (Allport). Length, two to three feet.

174. *CROSSORHINUS BARBATUS*, L. *Wobbigong*.

Spiracles wide, oblique slits side of head, with skinny appendages (about seven). Upper parts brown, marbled with grey. A whitish spot behind the spiracle.

Günth. Cat., VIII., p. 414. Allp. MS. Macl. Cat., 1095.

Common. Length, five to seven feet.

Fam. XLVIII. CESTRACIONIDÆ.

(No nictitating membrane. Two dorsal fins, the first opposite to the space between pectoral and ventral fins. An anal. Nasal and buccal cavities confluent. Teeth obtuse, several series being in function. Padlike.)

175. *HETERODONTUS PHILLIPPI*, Lacep. *Port Jackson or Bull-head Shark*.

Günth. Cat., VIII., p. 415 (Cestracion). Allp. MS.

Macl. Cat., 1097.

Common in the Derwent and Tamar. Known to the fishermen by the name of Bull-head Shark.

Fam. XLIX. SPINACIDÆ.

(No nictitating membrane. No anal fin. Pectorals not notched at their root. Snout with lateral armature. Each dorsal with a spine.)

176. *ACANTHIAS VULGARIS*, Risso. (A.) *Spotted Spiny Dog*.

Origin of dorsal opposite or behind the inner posterior angle of pectoral.

Günth. Cat., VIII., p. 418. Allp. MS. Macl. Cat., 1099.

Very abundant.

177. *ACANTHIAS BLAINVILLII*, Risso. (A.) *Spiny Dog*.

First dorsal conspicuously in advance of the inner posterior angle of pectoral.

Günth. Cat., VIII., p. 419. Allp. MS. Macl. Cat., 1100.

Abundant. Scarcely distinct from *A. vulgaris*.

Fam. L. RHINIDÆ.

(No anal fin. Pectorals deeply notched in front at the root.)

178. *RHINA SQUATINA*, L. *The Angel Shark*.

Mouth anterior. Pectoral fins large, expanded, in the plane of the body.

Günth. Cat., VIII., p. 430. Allp. MS. Macl. Cat., 1103.

Common.

Fam. LI. PRISTIOPHORIDÆ.

(Snout much produced, with lateral teeth, saw-like.)

179. PRISTIOPHORUS CIRRATUS, Latham. (A.)
- Saw Fish.*

Sets of teeth in upper jaw, 42.

Günth. Cat., VIII., p. 432. Allp. MS. Macl. Cat., 1104.
Not common.

180. PRISTIOPHORUS NUDIPINNIS, Günth. (A.)
- Saw Fish.*

Sets of teeth in upper jaw, 35 - 39.

SECOND SUB-ORDER BATOIDEI. (*Rays.*)

(Body depressed. Gill-openings ventral. Tail long. No anal fin. Dorsal fin, if present, on the tail.)

Fam. LII. RHINOBATIDÆ.

(Trunk passing gradually into the strong and long tail, which is provided with two dorsal fins and a caudal. Pectorals not extending to the snout.)

181. TRYGNORHINA FASCIATA, Mull and Henle.
- The Fiddler.*
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- A series of obtuse distant tubercles along the median line of the back.

Günth. Cat., VIII., p. 400. Allp. MS. Macl. Cat., 1111.
Not uncommon.

Fam. LIII. TORPEDINIDÆ.

(Trunk a broad smooth disc. Rayed dorsal and caudal fins generally present. An electric organ.)

182. NARCINE TASMANIENSIS, Rich.
- Electric Torpedo.*

Disc elliptical. Colour brownish.

Günth. Cat., VIII., p. 452. Allp. MS. Macl. Cat., 1112.
Length up to six feet. Not common.

Fam. LIV. RAJIDÆ.

(Disc broad, rhombic, generally rough. Tail with a longitudinal fold on each side. Pectorals extending to the snout. No electric organ. No serrated caudal spine.)

183. RAJA LEMPRIERI, Rich.
- Thorn-back.*

Spines on the superciliary edge, on the mesial line, between head and humeral cartilage, and a row down middle of tail directed alternately left and right.

Günth. Cat. VIII., p. 463. Allp. MS. Macl. Cat., 1114.
Common.

Fam. LV. TRYGONIDÆ.

(Pectoral fins uninterruptedly continued to and confluent at the extremity of snout. Tail armed with spine, but without lateral longitudinal folds.)

184. *UROLOPHUS CRUCIATUS*, Lacep. *Stingaree*.
Yellowish uniform, or with one or three blackish longitudinal bands, crossed by others of same colour.
Günth. Cat., VIII., p. 486. Allp. MS. Macl. Cat., 1121.
Abundant in the mud-flats of land-locked bays.

Fam. LVI. MYLIOBATIDÆ.

(Sides of the head free from the pectoral fins; snout with a detached pair of cephalic fins.)

185. *MYLIOBATUS AQUILA*, L. *Eagle or Whip-tail Ray*.
Median teeth of upper jaw four to six times as broad as long.
Günth. Cat., VIII., p. 489. Allp. MS. Macl. Cat., 1122.
Tasmania (Allport).

SUB-CLASS *Cyclostomata*.

Fam. LVII. PETROMYZONTIDÆ.

186. *MORDACIA MORDAX*, Rich. (A.) *Common Lamprey*.
Body eel-shaped. Sectional disc elliptic, with a free lip behind. The first dorsal distant from second.
Günth. Cat., VIII., p. 507. Allp. MS. Macl. Cat., 1127.
Abundant at certain seasons, clinging to the sides of perpendicular rocks under mill-shoots, Cataract Gorge, North Esk, Launceston.
187. *GEOTRIA ALLPORTI*, Günth. *The Pouched Lamprey*.
Günth., Proc. Zool. Soc. 1871, p. 675. Allp. MS. Macl. Cat., 1131.
Not uncommon in fresh water, Derwent, North Esk, St. Leonard's.

SUB-CLASS *Leptocardii*.

Fam. LVIII. CIRROSTOMI.

188. *BRANCHIOSTOMA LANCEOLATUM*, Pall. *The Lancelet*.
Transparent; slightly iridescent.
Günth. Cat., VIII., p. 513. Allp. MS. Macl. Cat., 1133.
Tasmania (Allport).
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A D D E N D A.

The following were described or came under notice during the publication of this work.

1. *LOPHOTES GUNTHERI*, Johnston.

B. 6. D. 221+36. A. 6·14. P. 14. V. 1·5.

L. lat. 208. Reticulate markings.

Johnston, (Proc. Roy. Soc. Tas., 1882.)

Rare.

2. *CHILODACTYLUS MULHALLI*? Macleay. *The Butter Fish*.

B. 6. D. 15 : 1·25. A. 3·9. V. 1·5.

L. lat. 53. L. tr. 6·16.

Length of head nearly equal to depth of body, and contained four and a-half times in total length. Fifth, sixth, and seventh spine of dorsal longest. Body elongate, and somewhat rounded. Mouth protractile. No teeth on vomer or palatines. Villiform teeth on jaws. Opercles covered with small scales. Scales on body three quarters of an inch square, with margins darker and reduced to a flaccid membrane. Pectoral composed of eight branched and six simple rays, the second of the latter longest, and reaching to a vertical drawn through thirteenth spine. Uniform brownish black. Total length, 29 inches.

I have referred this species doubtfully to *C. Mulhalli*, Macleay. It appears to agree with the species named in every respect, with the exception of the number of anal spines,—the Sydney species having 2, and the Tasmanian 3. It would be well to examine a greater number of specimens to ascertain if this feature be constant.

3. *APOGON LEMPRIERI*, nov. sp.

B. 7. D. 6 : 1·10. A. 2·9. L. lat. 27. L. tr. 3·10.

The height of body is equal to length of head, and is contained nearly three times in the total length. Snout short; length about half the diameter of eye, which latter is fully one-third of the length of the head. The maxillary scarcely reaches to the vertical from the posterior margin of eye. Lower jaw prominent. Two minute cavities on upper part of snout. Hinder margin of præoperculum minutely dentate. Anterior ridge simple. Spine of operculum reduced to a soft pointed membrane. No dark spots on root of caudal.

Uniformly brownish, with iridescent shades of purple, gold, and light blue; lighter towards belly. Tips of ventral and dorsal fins blackish. Other fins light reddish.

Total length of specimen caught at Dunkley's Point, Sandy Bay, 4 inches.

Measurement—

Total length	4 inches.
Length of body.....	$3\frac{1}{5}$ „
Head	$1\frac{3}{8}$ „
Greatest depth	$1\frac{3}{8}$ „
Diameter of eye.....	11 mil.
Length of snout	5 „
Anterior dorsal, 1st spine.....	7 mil. long.
„ 2nd spine	16 „
„ 3rd spine	15 „
„ 4th spine	13 „
„ 5th spine	8 „
„ 6th spine	3 „
Posterior dorsal, 1st spine	13 „
Longest ray, ditto.....	19 „
Longest ray of anal fin.....	19 „
1st spine ditto	3 „
2nd spine ditto ..	19 „
Longest ray of ventral fin	21 „

4. *GOBIESOX CARDINALIS*, Ramsay.

D. 8. A. 6. V. 4. P. 22.

Proc. Linn. Soc. N.S.W., vol. VII., p. 148.

5. *CORYPHENOIDES TASMANIÆ* (nov. sp.), *Tasmanian Whiptail*.

B. 7. D. 15 : 103. A. 90 (?). V. 8.

Snout short and obtuse, not projecting beyond mouth. Length nearly six times that of the head, which latter is longer than the greatest depth of body, and measures three times the length of snout. Diameter of eye scarcely equal to length of snout. Barbel rudimentary. Scales small, smooth, without ridges or spines. There are eight series of scales between anterior dorsal and the lateral line. The lateral line is composed of about 133 series of scales, the pierced scales being interrupted. First dorsal is composed of 15 feeble jointed rays, the length about twice the diameter of eye. The second dorsal commences near to the termination of first dorsal. The anus is situate under the 17th ray of second dorsal, and nearer to snout than to tail by twice the length of snout. Uniform silvery plumbous, with a purplish shade. Observed in schools at certain seasons, between Port Davey and Macquarie Harbour, and enters the Derwent occasionally. The specimen from which the description has been taken was captured at Kangaroo Bluff by Dr. Graham. Total length, $15\frac{1}{4}$ inches.

It is very probable that *C. denticulatus*, Rich, which is found on the South Australian and New Zealand coasts, also inhabits Tasmanian waters. The latter species is distinguished from that now described by having 11 rays in first dorsal, and