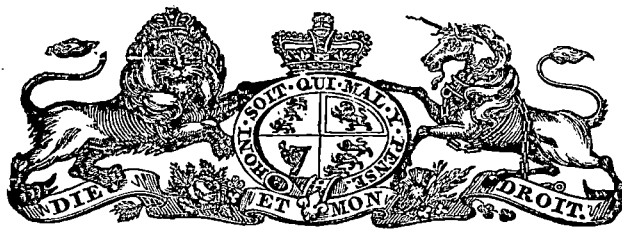


(No. 92.)



1882.

T A S M A N I A .

LEGISLATIVE COUNCIL.

## FISHERIES OF TASMANIA:

REPORT OF ROYAL COMMISSION.

Laid upon the Table by Mr. Moore, and ordered by the Council to be printed,  
October 31, 1882.

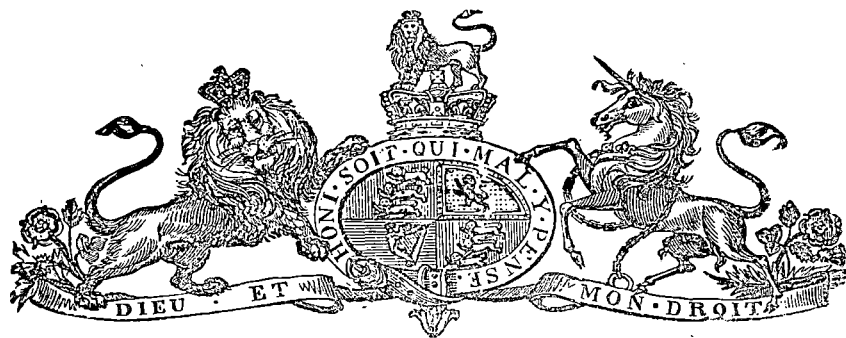
ROYAL COMMISSION  
ON  
THE FISHERIES OF TASMANIA.

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REPORT  
OF  
THE COMMISSIONERS,

TOGETHER WITH

*General and Critical Observations on the Fisheries of the Colony ; Classified Catalogue of all the known Species ; Abstract of the Minutes of Proceedings of the Commission ; Evidence taken before Commissioners ; Statistics, &c.*



Tasmania:  
WILLIAM THOMAS STRUTT, GOVERNMENT PRINTER, HOBART.

1883.



*VICTORIA, by the Grace of God of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith.*

To Our trusty and well-beloved CURZON ALLPORT, Esquire; the Honorable CHARLES HAMILTON BROMBY, Member of the House of Assembly; WILLIAM ALGERNON GUESDON, Esquire; RICHARD FRANCIS IRVINE, Esquire; ROBERT MACKENZIE JOHNSTON, Esquire; ROBERT CARTWRIGHT READ, Esquire; ALEXANDER RIDDOCH, Esquire, Member of the House of Assembly; MATTHEW SEAL, Esquire; JOHN SWAN, Esquire; ALEXANDER GEORGE WEBSTER, Esquire; and HARDWICKE WEEDON, Esquire.

**GREETING:**

WHEREAS we have thought it expedient to appoint a Commission to enquire into the Fisheries of the Colony of Tasmania, the Laws relating to the preservation of fish both in coast and inland waters, and to what extent (if any) the Fisheries of the said Colony have been or are injuriously affected by sea-fishing within Tasmanian waters by vessels from other Colonies, and to report thereon for the information of His Excellency the Governor on or before the thirtieth June next: KNOW YE that We, reposing great trust and confidence in your fidelity, discretion, and integrity, do, by these presents, authorise and appoint you, or any five or more of you, to inquire into the Fisheries of the Colony of Tasmania, the laws relating to the preservation of fish, and to what extent the Fisheries of the said Colony have been or are injuriously affected by sea-fishing within Tasmanian waters by vessels from other Colonies, and to report thereon for the information of His Excellency the Governor on or before the thirtieth day of June next: AND Our will and pleasure is that you, or any five or more of you, upon due examination of the premises, do, on or before the thirtieth day of June next, or within such further time as We may in that behalf appoint, certify to us in Our Executive Council in Tasmania aforesaid, in writing under your hands and seals respectively, all and every of your several proceedings by force of these presents, together with what you shall find touching or concerning the premises aforesaid, together also with all such suggestions respecting such matters as aforesaid as you may think fit to be made: AND we hereby command all and singular such persons as you shall judge necessary within Tasmania aforesaid that they be assistant to you and each of you in the execution of these presents. IN TESTIMONY whereof We have caused these Our Letters to be made Patent, and the Public Seal of Our Colony of Tasmania to be hereunto affixed.

WITNESS Our trusty and well-beloved SIR GEORGE CUMINE STRAHAN, Knight Commander of the Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief in and over the Colony of Tasmania and its Dependencies, at Hobart, in Tasmania aforesaid, this thirtieth day of January, One thousand eight hundred and eighty-two.

GEO. C. STRAHAN.

By His Excellency's Command,

WM. MOORE, *Colonial Secretary.*

(Seal of the Colony.)

WE will and command that the within-written Commission shall continue in full force and virtue until the thirty-first day of August next, anything in the said Commission contained to the contrary notwithstanding: IN TESTIMONY whereof We have caused the Public Seal of the Colony of Tasmania and its Dependencies to be hereunto affixed.

Dated the twenty-ninth day of June, One thousand eight hundred and eighty-two.

GEO. C. STRAHAN.

By His Excellency's Command,

WM. MOORE, *Colonial Secretary.*

(Seal of the Colony.)

**GOVERNMENT NOTICE.**

No. 129.

*Colonial Secretary's Office, 1st May, 1882.*

THE Governor has been pleased to place the names of the under-mentioned gentlemen on the Royal Commission appointed to enquire into the Fisheries of the Colony:—Messrs. Charles Torrens Belstead; Edward Daniel Swan.

By His Excellency's Command,

W. R. GIBLIN, *for Colonial Secretary, absent.*

## R E P O R T.

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*To His Excellency SIR GEORGE CUMINE STRAHAN, Knight Commander of the Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief in and over the Colony of Tasmania.*

MAY IT PLEASE YOUR EXCELLENCY.

WE, the Members of the Royal Commission appointed on the 30th January last to enquire into the Fisheries of the Colony of Tasmania, the Laws relating to the preservation of Fish, and to what extent the Fisheries of the said Colony have been or are injuriously affected by sea-fishing within Tasmanian waters by vessels from other Colonies, have the honor to report to Your Excellency as follows :—

Since our appointment we have held forty-one meetings,—at Hobart, Launceston, the Salmon Ponds on the Plenty, New Norfolk, and Bridgewater—and we have altogether personally examined thirty-two witnesses. We have also prepared tabulated enquiry circulars which were forwarded to eighty-three persons throughout the Island who from their special or local knowledge were in our judgment best fitted to give or procure reliable information on all matters relating to Fish and Fisheries in their neighbourhood. These circulars have been well responded to, and they contain in many instances valuable suggestions, which are treated of under the various classified sections of this Report. We have also derived much advantage in our enquiries in being able to consult the following Reports, &c.; viz. :—

1. Report of the New South Wales Royal Commission to enquire into the actual state and prospect of the Fisheries of that Colony.
2. Report of the New South Wales Oyster Commission of 1877.
3. Various yearly Reports of Inspectors relating to the Sea and Inland Fisheries of Great Britain and Ireland.
4. Parliamentary Paper, House of Assembly, Tasmania, 1873, No. 80, "History of the Introduction of Salmonidæ into Tasmania," by Mr. Morton Allport.

We have specially to mention the excellent Report of the Fisheries Inquiry Commission of New South Wales, whose mode of enquiry seemed to us to be so admirably arranged that we have thought it best to follow their example as closely as the special nature of local enquiries would admit.

One of our number (Mr. Johnston), at our request, has most willingly placed at our disposal the manuscript of a paper prepared by him for the Royal Society of Tasmania, entitled "General and Critical Observations on the Fishes of Tasmania, with a complete Catalogue of all the known Species." This manuscript has been of considerable service to us in conducting our enquiries; and as it exhaustively treats of one of the principal divisions of our Report,—viz., "Our Fishes,"—we have thought it better to append it to this Report as a special amplification of this important division. This arrangement also gives us the advantage of eliminating from the general remarks matters which, though of great importance as regards the natural history of fishes, are only indirectly related to the main objects of our enquiry.

Obviously, in matters of inference which lie beyond simple and direct observation, the opinions of witnesses examined are often conflicting: occasionally, too, we may have to make allowances for the expression of opinion where self-interest is immediately concerned; but, upon the whole, we have to acknowledge that there is a wonderful unanimity of opinion among the many witnesses examined upon all matters coming more directly within the scope of ordinary experience and simple observation, some of which matters have an important bearing upon the most vital questions affecting the future of the fishing industries of Tasmania.

Fishes undergo so many changes from the stage when the ovum is voided or deposited up to the fully developed condition of the mature individual, that it is only the most intelligent who can mark them; and those whose interest it is to specially protect the fishing industry are often, by ignorance of the natural history of our most important market fishes, the principal agents in accomplishing the impoverishment or the total destruction of the sources of their own industry.



For example : Although the mature individuals of such an important market fish as the Silver Bastard Trumpeter (*Latris Forsteri*) are in a great measure naturally protected by the depth of water and the limits of the more injurious modes of capture by man, yet the young fry of the same species naturally seek the upper shallows for food, and possibly as protection from their natural enemies. In this stage, however, they are very unlike the adult form, and are, moreover, exposed to a new danger which is difficult for them to escape, in the shape of the destructive seine net. Left to natural enemies, and to less barbarous modes of capture, the sources of our principal market fishes would not, as at present, be almost wholly destroyed where the seine net is freely employed.

From considerations of this kind it must be apparent that, as the necessary foundation of any practical enquiry, we should study something of the natural history of the fishes which form our market supply if we would hope to effect any practical good in the direction of development and protection. Hence it is of so much importance to learn accurately of each species—its migratory habits; its seasons; the time, mode, and place of spawning; the nursery-grounds of the young fry; their natural enemies; their feeding-grounds in the adult stage; their vitality in imprisonment, as in the wells of boats, &c. For, if we be ignorant of these matters, we cannot hope that good practical results would follow.

These observations will be sufficient to justify our modes of enquiry to those who have followed our remarks so far. Having carefully sifted the mass of evidence which is appended to this Report, we may proceed to deal with the several matters coming within our enquiries in such a form as will be most convenient for special comment and ready reference.

To give effect to these considerations we have carefully deliberated over the headings of divisions, and the following form was finally adopted as, in our judgment, being the most suitable; viz.—

- I. Introduction to Report.
- II. Our Fishes—
  - Fishes Proper.
  - Crustaceans.
  - Molluscs.
  - Whale Fisheries.
- III. Fishing Industry.
- IV. Fish Markets.
- V. Protection of Our Fisheries.
- VI. Fishery Laws.
- VII. Pisciculture and Acclimatisation.
- VIII. Development of General Fishing Industry.
- IX. Recapitulation.

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## II.—OUR FISHES.

This subject falls conveniently into the four following divisions :—

- 1. Fishes Proper.
- 2. Crustaceans.
- 3. Molluscs.
- 4. Whale Fisheries.

The first of these divisions is so exhaustively treated of in Mr. Johnston's paper appended, that it is only necessary here to give a brief outline of their natural history.

### *Fishes Proper.*

The known sea and inland fishes of Tasmania, including the successfully acclimatised European fishes, number 188 species. These are grouped by naturalists under three sub-classes, 57 families, and 132 genera.

The first sub-class, *Teleostei*, embraces nearly all our edible fishes; and the second and third sub-classes embrace the sharks, rays, lampreys, &c., which include 29 species, grouped under 15 families and 25 genera.

Hitherto no attention has been specially directed to the migratory movements of the great shoals of sprats, mackerel, and horse-mackerel which visit our shores periodically; but it would appear, from the observations of the more intelligent fishermen, that the shoals first appear every season more or less regularly in the neighbourhood of Port Davey, apparently coming from the south-west. From thence they are known to work along the East Coast towards the north.

The cause of this periodical northerly movement is, as yet, very obscure; but it is noteworthy that, simultaneously with their appearance in large numbers, our waters appear to be literally alive with a minute crustacean called by the fishermen "brit." All fish appear to prey upon this minute animal, but especially so the sprat and horse-mackerel. When the "brit" are most abundant, all fish seem to increase in numbers and in quality.

The sprat seems to be the prey of the barracouta; the presence and numbers of the former is said by fishermen to be a true indication of the presence and the abundance of the latter. At the same time, it is also clear that the kingfish principally subsist upon the great shoals of young horse-mackerel, the presence and abundance of the one being invariably a good indication of the presence and abundance of the other.

The numbers of these migratory fish, especially our highly-prized and valuable kingfish, appear to fluctuate to a great extent over a given number of years. The extent and nature of this fluctuation are best indicated by a reference to the following statistics of the export of kingfish to Victoria by the principal exporter, Mr. Barnett, for the decade ending 31st December, 1881, as follows:—

*Kingfish (Thyrsites Solandri) exported by Mr. Barnett.*

<i>Year.</i>	<i>Dozens.</i>
1872 .....	1023
1873 .....	981
1874 .....	1316
1875 .....	2405
1876 .....	1037
1877 .....	508
1878 .....	503
1879 .....	126
1880 .....	20
1881 .....	5

Thus it would appear that the curve of abundance reached its greatest height in the year 1875, gradually diminishing to 1881, when there was a decrease of 2400 dozens in the export of our principal fish-dealer. This splendid fish, averaging 12 to 14 lbs., and often reaching 20 lbs. in weight, during the years 1874-1875 appeared in such vast numbers that they were actually sold by fishermen in great quantities for manure. The falling off in numbers has greatly affected our local industry, as it formed, with the trumpeter, barracouta, and crayfish, our chief fish export. It would seem, however, that the insignificant-looking "brit" may have much to do with the varying curve of abundance, and that the temperature of different seasons may as greatly affect the productiveness of the "brit" as it does the productiveness of the oyster. We may, therefore, hope that we are now at the lowest point as regards the productiveness of the kingfish, and that natural causes will gradually work round again to seasons of abundance and prosperity.

The reasons given by fishermen for the neglect of our large stores of wealth in the shoals of sprats and anchovies are generally to the effect that, in addition to the absence of proper appliances for their capture, there are no curing establishments in our midst to induce them to venture upon this source of industry. No doubt in time, as our knowledge increases, this reproach against local enterprise will be removed, and our fishing industry greatly expanded in consequence.

The natural history of the trumpeter and other important fishes are given so fully in Mr. Johnston's "General Observations" appended, that it is unnecessary to do more than to state that the observations by that gentleman are, in the main, fully borne out by the evidence taken before us during our enquiry.

*Crustaceans.*

The only members of this order of any commercial value are the following;—

1. *Palinurus Edwardsii* ..... The Common Crayfish.
2. *Astacopsis Franklinii* ..... The Freshwater Lobster.
3. *Pseudocarcinus gigas* ..... The King Crab.
4. *Penæus sp. ?* ..... The Prawn, usually termed Shrimp.

The first of these, the crayfish (*P. Edwardsii*) is, perhaps, one of the most important of our marine products, being not only esteemed for its quality, but for its great commercial value from its wonderful abundance, especially around our eastern coasts. It is estimated that there are over 280 tons of this

splendid crustacean brought to market yearly, including those which are exported from Hobart, but exclusive of those used for baiting purposes and of the large quantities captured on the north-eastern coast in so called lobster-pots, which are taken direct to Victorian ports by smacks belonging to that Colony. The mature crayfish weighs from 6 to 7 lbs. The female is readily distinguished from the male, even when the roe is undeveloped, by the double claws on the last pair of legs of the former, the latter having the same claws simple. As it may be yet desirable to protect the females, this distinction may be of much practical value. Crayfish cast their shells every summer, the extreme range of moulting for all places being from September to February. The time during which they are thus moulting is termed the period when they "cease to run." It is stated by Mr. Barnett that the crayfish cease to run much earlier between Crayfish Point and Adventure Bay in the Derwent (generally from September to December), and that in localities extending southwards and beyond these limits they are later—generally from December to February. The females with ova attached are more numerous seen between May and December. Generally speaking, the fish are soft and unfit for food between December and February; and for this reason, and for greater protection, it is considered by many experienced fishermen that there should be a close season for the crayfish at this time, and that the sale of females with ova attached, and all crayfish under 10 inches, should be declared illegal.

The King Crab (*Pseudocarcinus gigas*) is a splendid animal, sometimes reaching a weight of 20 lbs. It is only brought to market occasionally, however, and is not therefore of much commercial importance.

The Thorny Lobster, or Fresh-water Lobster (*Astacopsis Franklinii*) exists chiefly in rivers emptying into Bass' Straits, and until recently was supposed to be wholly confined to such rivers. They were at one time very abundant in the Ringarooma and other large streams, and, according to the evidence of Mr. Brown, District Surveyor, they have been found weighing from 8 to 10 lbs., and measuring 2 feet across when the nippers were stretched. The same observer has noticed that, although they may be caught all the year round in favourite localities, yet they are in best condition in the month of February. They are, as a rule, not found in rivers which do not possess the Unio (*U. moretonicus*), which is itself almost similarly restricted in its distribution. Those said to be found in the Gordon are exceptional. Mr. Brown states that he has counted 250 perfect shaped lobsters attached to a female during the winter season. This would indicate that the lobster spawns during this season. The largest individuals may be found in the shallowest water. Since the tin-mining operations have opened up these naturally protected rivers, the numbers of lobsters seem to be decreasing fast,—the decrease hastened, it is said, by the silt from the various tin mines. They are esteemed to be very delicious, but they are rarely brought to market owing to distance and scarcity.

The Prawn (*Penæus sp.*), locally known among fishermen as the shrimp, abounds all around our coasts, approaching the shallows and entering the brackish waters of estuaries in myriads during the summer. It is only in the River Tamar, however, where a systematic mode of fishing is carried on. This is somewhat surprising, as there is evidence to show that this little crustacean is generally esteemed a great delicacy, the demand in Launceston alone being so far in excess of supply that a considerable export to Victoria in former years has now ceased in consequence.

In the flats above and below Bridgewater it would appear that during the summer these crustaceans are to be found in abundance, and no doubt, if sought for with the proper appliances such as now used in the Tamar, the citizens of Hobart would be benefited by a valuable addition to the existing market supply.

In the Tamar a small-meshed open purse-net is used, with beam about 8 feet long, the radius of the half-bow being about 2 feet 6 inches. Five or six boats are employed during the height of the season in the Tamar. In dry seasons the prawn ascends the river earlier, and in greater numbers. It would seem that when there has been much rain or snowfall, that the progress of the prawn to the upper waters is arrested by the excess of fresh in the river. This reason is given by one of the witnesses to account for the greater scarcity of prawns in the Tamar latterly as compared with former years.

During the last season one of the shrimpers states that his highest take in one night was 100 quarts, the lowest 1 quart, and the average 20 to 30 quarts. The average price in Launceston is 6d. a quart.

#### Molluscs.

The existing molluscs of Tasmania in all number nearly 1000 known species. Many of them, regarded as the natural food of the more important marine animals, no doubt bear indirectly an important relation to the fishing industry. There are, however, only two species which, so far as we are now able to judge, may be deemed worthy of special notice as regards this Report; viz. :—

1. The Common Oyster, or Mud Oyster (*Ostrea edulis var.*)
2. The Common Mussel (*Mytilus latus.*)

1. The common, or mud, oyster of Tasmania, although unfortunately not now abundant, is very generally distributed around our coasts, particularly in the larger estuaries whose waters are more or less influenced by the discharge of the fresh-water rivers. About 20 years ago the native oyster-beds, especially in many of the sheltered bays in the neighbourhood of the Prosser, Huon, Derwent, and other rivers on the south-eastern coast, were so abundant, and of such commercial importance, that the testimony of well-informed and trustworthy witnesses seems now almost incredible.

From the evidence of Mr. Barnett, however, which has been substantially confirmed by other reliable witnesses, it appears that when the oyster-fishing industry was at its best there were no less than 6 or 7 boats employed in dredging for oysters at Southport alone. Mr. Barnett, moreover, has, with more than usual care, kept a record of the oysters dredged and brought to market during these years. Taking one of the best years, it would appear that the oysters dredged from the principal native beds were as follows:—

	<i>No. of Bags.</i>	<i>No. of Oysters.</i>
Southport .....	6912	3,456,000
Cloudy Bay .....	4668	2,334,000
Port Esperance .....	5780	2,890,000
Spring Bay .....	16,870	8,435,000
Swanport .....	10,470	5,235,000
<b>TOTAL .....</b>	<b>44,700</b>	<b>22,350,000</b>

At this time, from their cheapness and abundance, the local consumption, apart from export, was very large indeed. It is astounding to contemplate the fact that the quantity then brought to market in one year would now, at current prices, realise a sum of £93,125,—that is, a sum more than the equivalent of the value of the last three years' export of grain, hay, flour, and bran from Tasmania.

It is not surprising, therefore, that those who remember the abundance and commercial value of the original oyster beds should again and again have attempted to do something to improve the present neglected and almost obsolete industry, and to claim from time to time the aid of Parliament in promoting the welfare of an industry which reasonably might again become of wide national importance.

When we consider that the only natural beds which may be profitably worked are now to be found only in the vicinity of Spring Bay, and that the total yield does not amount to more than 100,000 oysters per year, it is humiliating to us to confess that the lesson in oyster culture given to the world by France many years ago should, in this Colony, be so thoroughly disregarded. It is true, the evidence shows that primitive attempts have been made to restock beds which had been rendered barren; but as these attempts were often mere transfers of mature oysters from one locality to another, often badly laid down, and receiving no attention afterwards, it is not surprising that they should result in failure.

The opinion of Mr. William Tapner, of Triabunna, one of our most experienced ostreiculturists, is of great value. He distinctly attributes the impoverishment of our native scalps to indiscriminate fishing, and to throwing down the culch into heaps, instead of distributing it regularly along the beds. He has frequently counted from 60 to 290 spat on one of the old shells, and he considers that not only would these be largely destroyed by the injurious practice which he so strongly condemns, but the ground would become unfit for the reception and growth of spat generally. He also, with others, states that scalps are often subject to a disease which is so virulent that wherever it appears on an oyster bank nearly the whole of the oysters upon the same bank would be sure to die out. Mr. Tapner, however, is of opinion that the banks so destroyed will recover in time naturally. It is to be hoped that this may prove true. It is not creditable that with such resources latent around our shores, we should at this moment be importing, from Sydney, oysters to the extent of about 288,000 annually—i.e., equal to a sum of about £1200.

Praiseworthy efforts have recently been made by Captain Stanley and others, in localities and by means which, at the time, gave promise of better success; but, either through the unfavourableness of season, or perhaps because of unsuitable nature of localities selected, success has not yet crowned their labours. The experience gained, however, may lead to better results hereafter.

It is clear, from the evidence of former abundance, that our waters are naturally favourable to the growth and development of the oyster, and that if suitable areas were again stocked, and, when stocked, cultivated according to the enlightened methods observed in France and elsewhere, that the wealth of our waters would soon again become apparent. Nothing has been so distinctly stated by all authorities as the fact that the whole secret of oyster culture lies in entrapping the spat when voided, by laying down suitable resting-places for the spat to adhere to. Pyramids of stones, tiles specially prepared and laid, hurdles, faggots, furze bushes, &c. have in different places been successfully employed for this purpose. It is stated that one cultivator alone in Auray, in France, possesses

200,000 tiles, and on these he obtained, in 1869, 6,000,000 of oysters. It has also been shown by experienced cultivators that the grounds suitable for growth and fattening are rather prejudicial to spatting. An excess of fresh water and a strong current, favourable to the former, would be quite unfavourable to the latter. The fact that Spring Bay has always maintained its position as the most productive of our native oyster beds adds weight to this conclusion. Hence it seems, that the two departments, the breeding and the fattening, must equally be kept in view by those who desire to succeed in ostreiculture.

The Commission appointed by the Government of New South Wales, in the year 1877, to enquire into the oyster industry of that colony, have collected valuable information upon this matter. They have recommended the utilising of salt-water swamps or marshes, more or less covered by the tides, for the formation of "claires" for fattening. The occasional exposure to the rays of the sun between the tides appears to be rather advantageous than otherwise, as it has the effect of killing a species of sponge which frequently attacks the oyster and destroys it. Local cultivators might profit by this suggestion, for it would give them the advantage of keeping in check all the natural enemies of this valuable shell-fish. Spatting has also been shown to be more successful in a warm season; and this, together with attempts to breed where waters may perhaps be too fresh for the purpose, may account for any want of success which may have attended any recent efforts towards the establishment of the oyster industry in Tasmania.

The Common Mussel (*Mytilus latus*) is very abundant around our coasts within the influence of the fresh water—especially so in the estuary of the Derwent. Although it is esteemed by many as of excellent quality, there seems to be none brought to market for food. They are chiefly used as bait for the capture of perch, rock-cod, and other fish when the latter ascend into the upper waters of estuaries.

The following shell-fish are abundant in certain localities, and are consumed by those in the vicinity of the coast, although they do not seem to find their way to the Hobart market; viz. :—

The Mutton Fish . . . .	<i>Haliotis nævosa</i> .
The Tasmanian Cockle .	<i>Cardium tenuicostatum</i> ; also <i>Venus aphrodisinoides</i> .
The Large Mariner . . .	<i>Turbo undulatus</i> .
The Native Whelk . . . .	<i>Trochocochlea constricta</i> .
The Common Scallop . .	<i>Pecten</i> sp.

None of the squid family seems to be sought after, although certain kinds are somewhat abundant in our waters. It is stated by the New South Wales Fisheries Enquiry Commission, 1880, that "the cephalopods might be made a source of considerable profit for exportation to Japan and China. In both these countries all animal substances of a gelatinous character are in great request, and none more than those of the cuttle-fish tribe; the squid (*Sepioteuthis Australis*) is highly appreciated, and in consequence is highly prized. The cuttle-fish (*sepia*) is of rather inferior quality, and the star-fish of the fishermen (*octopus*) not used at all."

It may also be recorded here that for necklaces, ear pendants, and other ornamental purposes, some of our shells are most highly prized. The following are largely collected and prepared by the half-castes on the Barren and Badger Islands, and obtain fair prices, viz. :—

Trigonia Margaretacea . . . . .	Pearly Trigonia pendants and necklaces.
Elenchus badius . . . . .	} Blue and green pearly necklace shells.
" bellulus . . . . .	
" irisodontes . . . . .	
" nitidulus . . . . .	
Margarita Tasmanica . . . . .	
Truncatella scalarina . . . . .	} Rice-shell necklaces.
" Tasmanica . . . . .	
" marginata . . . . .	
" micra . . . . .	
Marinula pellucida . . . . .	Tooth-shell necklaces.
Columbella semi-convexa . . . . .	} Oat-shell necklaces.
" Lincolnensis . . . . .	
" irrorata . . . . .	
Nerita atrata . . . . .	Rosary shell necklaces and bracelets.

The following Tasmanian shells also command high prices from collectors on account of their beauty and rarity, viz. :—

*Voluta mamilla*.  
*Cyprea umbilicata*.

*Whale Fisheries.*

It is a question whether this special branch of fishing industry comes strictly within the scope of the contemplated inquiries by the Commission; but as a report upon fisheries generally would appear incomplete in the absence of reference to the subject, it is thought proper to supplement the information already available in the Statistics of Tasmania.

For greater convenience, the official records referred to relating to the last decade are reproduced in the Appendices, and those for the present year have been furnished by the Hon. Alex. M'Gregor, M.L.C., who has been for many years largely concerned in whaling.

Prior to the Australian gold discoveries in 1851-2, the pursuit of sperm whaling had attained very considerable importance at Hobart, of which it was then one of the main resources.

The attractions of the diggings and the great advance in wages and provisions not only suspended whaling for a time, but appear to have been the means of creating a permanent impediment to its resumption upon the former scale. It soon began to be apparent that whaling no longer offered the attraction to the class of young men from whose ranks capable officers were formed. Other drawbacks to successful whaling have no doubt further diverted suitable men from the trade.

The discovery and production of mineral and vegetable oils have materially affected the price of sperm, for which, in many cases, the former were found to be cheap substitutes. Whales for a time, too, were scarce, owing to excessive fishing by Americans and others; and, although they have again increased in numbers, the "takes" are, it is said, unremunerative at the present value of oil. This is now worth £65 per ton in Hobart, and is not likely to alter materially.

The gradual decrease from natural and other causes in the numbers of older officers, and the absence of young men to supply their places, make it a matter of extreme difficulty to man the few ships now employed.

With all these discouragements, it is not a matter of surprise that a trade which involves such a considerable amount of capital—in ship, boats, and outfit, on an average, £5000—and which is attended with so many risks, should have gradually dwindled away until 7 ships only remain in the trade, against 19 in 1872. Mr. M'Gregor is of opinion that there is no present prospect of improvement. In the face of the foregoing facts it seems impossible to arrive at any other conclusion.

## III.—FISHING INDUSTRY.

With an insulated population of only 120,000 inhabitants, it cannot be expected that the fishing industry of Tasmania can be extensive. Nevertheless, it is estimated that there are about 86 boats and 175 men engaged therein. The individuals engaged in selling or hawking the fish within the Colony may be estimated at about 80 in number. Altogether, it is estimated that, excluding those engaged in whaling, there are 1050 persons directly depending upon the local fisheries. Hobart is the chief centre of the industry, its position being particularly favourable in this respect, from its accessibility in all kinds of weather, and its proximity to the principal fishing-grounds.

Fully 63 per cent. of the men and boats belong to Hobart, and the men carry on their vocation either in the numerous indented sheltered bays in the upper or lower waters of the estuary of the Derwent, or in the exposed open sea,—trumpeter reefs, 40 to 80 fathoms, lying between Seymour on the north-east and Port Davey on the south-west.

The fishing carried on elsewhere, with the exception of the purely river fishing of the Tamar, is very limited indeed, generally engaged in at odd times by persons who do not devote themselves exclusively to fishing. The Tamar boats are not suited for fishing in the open sea beyond the Heads.

Generally speaking, the fishing-grounds may be divided into three classes, as follows:—

1. The Home Grounds, near shore or in the upper shallows of estuaries, where the seine is chiefly used in the capture of the following fish:—Sole, flounder, garfish, mullet. The oyster and crayfish are also captured by dredge and hoop-net in such shallow water, and generally in sheltered situations, so that this branch of the industry may also be said to be carried on within the home grounds.

2. The Middle Grounds.—Within this division may be included those fishing-reefs and banks lying in the outer and more exposed situation of estuaries, such as Wedge and Adventure Bays, in the estuary of the Derwent, in depth of water from five to six fathoms. In such localities the grab-net and ordinary hand-lines are chiefly used in the capture of native salmon (mature), the silver and red bastard, black and silver perch, carp, rock-cod, ling, conger-eel, &c. The indentations around the Eastern coast afford ample scope for following out the industry within the limits of this division, especially so in the many sheltered bays in the neighbourhood of Port Davey and the Derwent.

3. The Outer, or Open Sea Grounds, so far as they are worked at present, lie principally in the southern and eastern waters of Tasmania, and generally from one to sixteen miles off the coast, the depth of water varying from about 10 to 80 fathoms. The latter depth is the limit at which Tasmanian fishermen have been successful with deep sea-lines on the trumpeter banks. The fishing-boats employed in these exposed grounds are necessarily the best of their description, although the most of them are mere open whaleboats, fitted, as are nearly all our Hobart fishing-boats, with wells perforated in direct communication with the sea, admirably adapted for keeping the trumpeter and other fish alive until sold in market. The trumpeter especially will even feed in this confinement, and fish of this description have been kept alive over three months in the wells of boats.

On the deep-sea reefs and banks the following are the principal fish caught with hand-lines, viz.—the trumpeter, the perch, rock-gurnet, &c.

Towards the surface of these open sea waters the Maori jig is principally used in the capture of the barracouta; and, in the season, the line, armed with swivelled chain and stout barbless hook, is employed in the capture of the rapacious but valuable kingfish.

In the same waters abound shoals of sprats, anchovies, &c.; but the proper appliances for their capture do not exist here, and hence no attention has been paid to this possible source of wealth. The trawl-net has been tried around our coasts, but without success. The bastard Dorey exists in our waters, and if knowledge of its habits were more extended, the success of the trawl as a mode of capture might yet be realised to our advantage.

The value of boats and equipment at present engaged in the fishing industry of Tasmania may be roughly estimated at about £7700.

The estimated value of fish sales is very difficult to arrive at, as no systematic register has been kept, with the exception of Messrs. Barnett & Turner's, in respect of Hobart market sales. It is probable that since the decline of the oyster fishery it only amounts to about £10,000 per year. This, however, does not include the value of fish caught by non-professional fishermen, which, in a population so diffuse, with such an extensive sea boundary, must be very considerable.

#### IV.—MARKETS.

The only fish market in the Colony is at Hobart, and is governed by Regulations framed by the Municipal Council. The market is let annually in connection with the New Market at Hobart. The present lessee is Mr. Joseph Barnett, who, by virtue of his position as such lessee, has the powers of, and is sworn as a constable. The due performance of the Regulations is also governed by the presence each morning of the City Inspector, whose duties are to see that such Regulations are carried out, and that no unwholesome fish are sold.

The fish for the supply of the market are usually brought direct from the fishing-grounds by the fishing-boats; they are handed from the boats by means of baskets, and are disposed of by public competition, each fisherman acting as his own auctioneer. The sales are not officially recorded at the market, but the lessee acts as clerk to two-thirds of the fishermen, and Mr. Thomas Turner fills the same capacity for the remainder.

The principal fish exported are barracouta, kingfish, trumpeter, eels, perch, trevally, and crayfish.

The value of the export trade has considerably diminished, owing to the failure of supply of the kingfish. It is, however, manifest to us that were the proper appliances available by refrigerators, or some other system of landing fresh fish in the markets of the other Colonies, the greater population of those Colonies, and the comparative scarcity of their local supplies, would be sufficient to create a largely increased export trade from this Colony.

In the interests of the fishermen and fisheries, it is highly desirable that more perfect statistics of the value of the industry should at all times be obtainable; and we recommend that a proper system of record of fish brought to market and sold either for home consumption or export should be instituted at both Hobart and Launceston; that in the latter town the establishment of a fish market under proper supervision is very essential; and that a more perfect system of supervision as to the fulfilment of the laws relating to fish is necessary throughout the Colony.

#### V.—PROTECTION OF OUR FISHERIES.

The necessity for more effective protection to indigenous fish is most apparent in reference to flounders, mullet, bastard trumpeter, and perch, because these fish are destroyed in such large numbers in an immature state, when they are quite unfit for market purposes. The effect of this destruction was manifested in the Derwent before the closing of the river, by a steadily continued

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decrease until the scarcity of river fish within such waters reached practical annihilation. This impoverishment was effected by the unchecked use of the seine-nets at all seasons.

When eventually the River Derwent was closed, for the protection of the imported Salmonidæ, the native fish reappeared and so rapidly increased year by year within the protected limits of the upper waters, that the abundance in which they are now found there is in strongly marked contrast to that in the neighbouring grounds which have been left exposed to injurious modes of capture. This important incidental advantage is all the more gratifying, as it was not contemplated when the Salmon Protection Act was passed. The beneficial effect being thus so marked, it seems to us to be very undesirable, at the present time, to again open this portion of the river to an unrestricted repetition of the former wanton process of destruction.

It is borne out in evidence that more fish of useful size are now captured by anglers in the upper waters of the Derwent than were taken by the nets before the closing of the river. This is confidently attributed to the fact that formerly the unrestricted netting had so reduced the stock as to render fishing for profit or sport scarcely worth following. The destructive process of invariably drawing the seine-nets on the shore, instead of emptying them in the water, is testified to by all the witnesses examined on this subject.

Mr. Barnett states, "I have known us leave bushels of small rock-cod on the beach at Sandy Bay and other places."

Robert Smith, fisherman, states, "I believe that seines destroy large numbers of young fish which in that state would not be useful for the market."

Francis Rush, fisherman, states, "That the destruction of young fish is the cause of scarcity of all fish," and "that there are more destroyed by seines than by other modes of netting."

Mr. James Morris states, as the evil effects of seine-net fishing before the river was closed, that he "got 3 or 4 barrow-loads at one time of small fish left by seining, in front of Derwentwater and the Arches."

This is an index of the almost unanimous opinion of witnesses on this subject; and the importance of protecting certain areas of estuaries, in the interests of professional fishermen and anglers, is borne out by nearly all the witnesses examined. Unfortunately, such fish as the flounder, garfish, and mullet can only be caught in sufficient numbers by the use of the objectionable seine. It has been shown, further, that it would be of no practical advantage to regulate the mesh, as the limits which permit other unsizable fish to pass would still enclose undersized flounders; besides, the weed, mud, &c. so choke the mesh that any alteration in this respect would scarcely be appreciable. The only plan left, therefore, is to follow the method adopted in Victoria and New South Wales, *i.e.*, to reserve certain areas as nursery-grounds, wherein the seine and other objectionable nets shall be absolutely prohibited. Where the seine-net is worked it should be compulsory to empty the net in the water, and not drawn upon the beaches as at present. With the view of restoring some of the now exhausted fishing-grounds in New South Wales, power has been vested in the Governor to entirely close for a period of years particular bays, lakes, and inlets. This is a most judicious act, and we would recommend a similar provision for this Colony, in the interests of our fisheries.

The setting of fixed nets across rivers, especially at or near their mouths, or the use of any net or other contrivance obstructing the natural channel, should be prohibited, or so regulated that injury to the fish by obstructing them in their migratory movements during the spawning season is effectively prevented. The restrictions in this respect in the neighbouring Colonies are somewhat as follows:—Fixed or stake nets so situated should be kept clear of weeds or other obstruction; should not be stretched completely across any creek or inlet; the minimum size of mesh should be 4 inches. We would recommend the adoption of this provision for Tasmania.

The general and most obvious mode of affording protection to fish is to prevent their capture at the time they are engaged in depositing their ova; but, with the imperfect and often conflicting information obtained by the Commission, it is difficult to arrive at any satisfactory conclusion which would be of practical value in determining a close season for the various species. It would appear that June and July are months in which the greater number of flounders spawn; but these fish carry their ova a considerable time. Flounders are found on the southern side of Tasmania in all the shallows of Frederick Henry, Norfolk, Adventure, Port Arthur Bays, and D'Entrecasteaux Channel, as well as in the Derwent. Indeed, it may be affirmed that flounders may be found wherever there are shallow banks with mud or soft sand bottom. The fishing-grounds named, however, have been seriously injured by over-netting.

The evidence taken in Launceston indicates that there is so much water in the Tamar naturally protected from netting, by snags and other obstructions, that the unrestricted fishing of the exposed



portions has not injuriously affected the general supply. It is apparent, however, from overwhelming testimony, that merciless seining will ultimately destroy any of the flounder-grounds.

Although it has been shown that there has been a falling-off in late years with regard to such fish as the silver bastard, trumpeter, and perch, and even a disappearance or a scarcity of trumpeter in the more accessible grounds, ascribed to over-fishing, we are not inclined to suggest any protective measure in this direction. Indeed we are inclined to believe that such a fish as the trumpeter is sufficiently protected naturally by depth of water, by distance, and by the exposed nature of the fishing reefs. We are also inclined to believe that the falling off in kingfish on the grounds hitherto fished is due to natural causes, at present obscure, and not, as alleged, to over-fishing.

The only natural enemy to small fish to which much attention has been directed, is the black cormorant. There are also two varieties of the black and white cormorant, the smaller of which goes into the fresh water. It is the imported salmonidae and the native herring that suffer most from the ravages of these birds. Rewards have been suggested as an inducement to destroy the cormorants, but these birds are so cunning, and their power of resisting shot so great, that we are not of opinion that much good would be effected in this direction without the continued expenditure of a large sum of money.

With regard to the introduced trout established in our rivers, there are laws for their protection; but we regret to find that wherever poaching can be carried on with safety, and that is almost everywhere, it is a too common practice. In the small streams, during the summer months, their destruction is effected so easily that complete protection can scarcely be hoped for. The waters in some places fall so low that the fish have no shelter but the stones at the bottom. Many creeks are nothing but a succession of bright shallow pools, from which the fish may be removed by the most primitive modes of capture. In the larger rivers trout establish themselves more firmly.

Further protection to the tributaries of the Derwent is urgently required, as these are the principal spawning-grounds of the migratory salmonoids. It is believed that the spawning fish are largely destroyed in the upper portion of the Lachlan River, where there are many excellent natural redds. The migratory salmonoids are of greater commercial value than the varieties of brown trout, and are consequently eagerly sought after and find a ready sale. It is specially to guard against the illicit capture of these valuable fish that the solitary water bailiff is employed. That his efforts have succeeded to some extent is demonstrated by the fact that the migratory fish are now to be found in abundance in the waters over which his duties extend.

It is strongly recommended by the recently formed Anglers' Society that additional bailiffs should be appointed, and we are of opinion that the recommendation should be complied with.

The destruction of our principal oyster-beds, and the present scarcity of oysters, referred to elsewhere, are attributed partly to reckless unrestricted dredging continued until the beds were wholly destroyed. It is believed, however, that some natural cause was operating concurrently with the causes alleged, as on many grounds, once so prolific, scarcely an oyster remains. It is reasonable to anticipate, therefore, that favourable seasons, and more enlightened methods of fishing, may permit the restoration of these grounds to something approaching their original productiveness. In the meantime, it would be well if the injurious practice of throwing down culch in heaps, instead of spreading the same over the beds, should be prohibited, as it destroys the spat, and makes the ground unsuitable for the reception of free spat.

The destruction of crayfish is stated to be carried on at a rate exceeding the natural increase. This seems to be so serious in some localities as to threaten extermination at no distant date. It is recommended that the sale or possession of crayfish under a length of 10 inches, and all spawn-carrying female fish, should be prohibited.

With regard to Victorian fishing-boats employed on our coasts, evidence goes to show that, with the exception of using what are termed lobster-pots in the capture of crayfish, which is stated to be objectionable, the fisheries of this Colony are not injured by their presence. In so far, however, as they compete with our own exporters of fish in the Victorian market, it may be conceded that our exporters and fishermen are injured to some extent by the limitation of their business. It may fairly be a matter for consideration whether boats belonging to other Colonies should be allowed to freely compete with our local industry within Tasmanian waters. So far as crayfishing is carried on the matter is simple enough; but, as regards trumpeter fishing—carried on in the open sea, from one to sixteen miles off the land—there are many difficulties to be encountered should prohibitory measures be contemplated.

Finally, for the better protection of the fisheries of the Colony generally, we recommend that the general administration, control, and direction of all matters relating to sea and inland fisheries be vested in one central Board, working under the Governor in Council, and that a skilled Inspector be appointed to carry out the Regulations to be fixed from time to time by the said Board.

## VI.—FISHERY LAWS.

We have examined the Laws relating to the Fisheries of Tasmania, which may be classified as under:—

1. Limits as regards places and times of fishing and close seasons.
2. Limits as regards size, &c. of fish which may be captured.
3. Authorised modes of capture.
4. Instruments, engines, injurious substances, &c. prohibited absolutely.
5. Instruments, &c. prohibited within particular localities.
6. Other provisions.
7. Oyster Fisheries.

The fish at present affected by law are, Salmon—which includes all migratory fish of the genus Salmon (43 Vict. No. 3, s. 2); Trout—which includes all non-migratory fish of the genus Salmon (42 Vict. No. 4, s. 3); Mullet or Herring—which means the fish frequently known as Cucumber Mullet or Fresh-water Herring; Flounders; and Oysters—which includes the brood, ware, half-ware, spat and spawn of Oysters (32 Vict. No. 16, s. 1).

1. *Limits as regards places and times of Fishing and Close Seasons.*

*Salmon.*—The fishing season for salmon with licensed nets is between 2nd September and last day of February inclusively, and with rod and line between 2nd September and 1st May inclusively (42 Vict. No. 3, s. 5). The close season is between 1st March and 1st September inclusively, except with rod and line, which may be used between 1st March and 1st May following inclusively (29 Vict. No. 6, s. 14).

*Trout.*—The fishing season for trout is between 2nd September and 1st May inclusively (42 Vict. No. 4, s. 10), and the close season between 2nd May and 1st September inclusively (42 Vict. No. 4, s. 7).

*Herring.*—Not to be taken, except with rod and line, anywhere (23 Vict. No. 10, s. 3).

*Oysters.*—Fishing season is 1st March to 31st October inclusively, per Regulations of 2nd March, made under 32 Vict. No. 16, s. 3.

2. *Limits as regards size, &c. of fish which may be captured.*

*Salmon.*—Not to be taken under 20 inches long (29 Vict. No. 6, s. 12 and 42 Vict. No. 3, s. 2).

*Trout.*—Not to be taken under 6 inches long, measuring from the eye to the fork of the tail (42 Vict. No. 4, ss. 3 and 6).

*Flounders.*—Not to be taken under 9 inches long (34 Vict. No. 24, s. 1).

*Oysters.*—Not to be taken under 2 inches in smallest diameter (Oyster Regulations, 2nd March, 1882).

*Unclean Salmon.*—Not to take, buy, sell, expose for sale, or have in possession unclean or unseasonable salmon (29 Vict. No. 6, s. 11).

*Spawning-beds.*—Not to wilfully injure, place device for obstructing passage of any “young of salmon,” or disturb spawning-bed (29 Vict. No. 6, s. 12).

3. *Authorised modes of capture.*

*Salmon.*—Nets to be licensed by the Treasurer of such lengths as may be mentioned in such licence (29 Vict. No. 6, s. 19). Rod and line (42 Vict. No. 3, s. 5).

*Trout.*—Rod and line only (42 Vict. No. 4, s. 10).

*Mullet or Herring.*—Rod and line only (23 Vict. No. 10, s. 2).

4. *Instruments, engines, injurious substances, &c. prohibited absolutely.*

*Salmon.*—Any light, spear, leister, gaff, strokehall, snatch, or other like instrument (29 Vict. No. 6, s. 5). Not to use any fish roe for fishing, or buy, sell, or have in possession any salmon roe (29 Vict. No. 6, s. 6). Use net of mesh with less dimensions than  $2\frac{1}{2}$  inches from knot to knot, or 10 inches measured round when wet (29 Vict. No. 6, s. 7).

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Fixed engine of any description (29 Vict. No. 6, s. 8.)

No dam to be used for catching salmon (29 Vict. No. 6, s. 9, sub-sect. 1.)

Not to catch, except with rod and line, any salmon in head or tail-race of mill, or within 50 yards below any dam; unless such dam has an approved fish-pass attached (29 Vict. No. 6, s. 9, sub-sect. 2). Permit to flow or put or knowingly permit to be put in any water any poisonous liquid or solid matter (29 Vict. No. 6, s. 4.)

*Trout*.—Nets and tackle other than rod and line (42 Vict. No. 4, s. 4.) Fixed engine of any description (42 Vict. No. 4, s. 5.) No fish roe as bait (42 Vict. No. 4, s. 13.)

*Mullet or Herring*.—Net or other engine or device except rod and line (23 Vict. No. 10, s. 2.)

Throw, or cause or allow to flow into any fresh water river, or lake, any lime or other matter or liquid deleterious to fish with intent to destroy any fish (23 Vict. No. 10, s. 4.)

### 5. *Instruments, &c. prohibited within particular localities.*

*River Derwent*.—No net to be used in the River Derwent or any of its tributaries above a line extending from the mouth of a creek running through land of — Garth, south of One Tree Point on the western bank of that River, to Tryway, or Droughty Point, on the eastern bank of the river. Provided that, between sunrise and sunset, set nets, known as “graballs,” may be used below a line extending from the northern part of the Cemetery at Cornelian Bay to the southern side of Gielston Bay.

*North Esk; South Esk; River Tamar*.—No net of any description (except shrimp-nets) to be used from the Cattle Wharf at Launceston upwards. (Regulations of 16th February, 1880, made under “The Salmon Act, 1865.”)

### 6. *Other provisions.*

*Salmon*.—Gratings to artificial channels (29 Vict. No. 6, s. 10.) Fish-passes (29 Vict. No. 6, ss. 16, 17.)

*Trout*.—Gratings to channels (42 Vict. No. 4, s. 12.)

### 7. *Oyster Fisheries.*

The law is divided into two classes,—

1. *Private Oyster Fisheries*.—The Governor has power to grant licence to owner of land on sea-shore or estuary to form oyster-bed, or where sea-shore is Crown property, lease, not to exceed 30 years.

2. *Public Oyster Beds*.—Are governed by Regulations made under authority of 32 Vict. No. 16, s. 13.

The foregoing brief epitome may prove useful. It must be clearly understood that it is not intended to be a full and complete exposition of law, but it will serve to indicate generally the existing law on the subject of fisheries.

It will be observed in preceding chapters that the suggestions made by us will, if approved of, necessitate legislation. Advantage, under such circumstances, might be taken to consolidate the law as to fisheries generally.

The question of limit of jurisdiction on the coast of this Colony is a matter which more properly comes within the scope of this section. The recognised three leagues' distance from shore (if this be the existing limit as regards Tasmania) is not sufficient to protect the interests of our fisheries, as some of our most valuable trumpeter-grounds are distant as far as 16 miles from the coast, and have already been fished upon by boats from other places. It would therefore seem desirable that the law on this subject should receive special attention, in order that effectual measures, by treaty or otherwise, may be introduced for the better protection of the valuable fishing-grounds around our coast.

## VII.—PISCICULTURE AND ACCLIMATISATION.

### 1. *Salmonidæ.*

The attempts which have been made in this Colony to acclimatise certain species of Salmonidæ may now be regarded as permanently successful. Dr. Günther, in his last work “The Study of

Fishes," published in 1880, in the chapter on acclimatised fishes, remarks, "that the most successful attempt of recent years is the acclimatisation of trout and sea-trout, and probably also of the salmon, in Tasmania and New Zealand \* \* \* by means of artificially impregnated ova." The experiment, if such we may now call it, having attained this satisfactory measure of success, we propose to notice shortly the various attempts which have from time to time been made to introduce salmon into our waters, and also the general results of these attempts. In doing this, we shall refer not only to the evidence taken by this Commission, but also to the various Tasmanian Parliamentary Papers on the salmonoids which have been issued; and we shall, especially as to the earlier stages of the undertaking, have occasion to borrow largely from Parliamentary Paper, House of Assembly, 1873, No. 80, containing a brief history by the late Mr. Morton Allport (to whom the success of the experiment in Tasmania is largely due), of the introduction of the Salmonidæ into Tasmania.

There is no doubt that as far back as the year 1841 the question of the practicability of introducing salmon and trout into Tasmania was entertained, but the first recorded attempt was not made till the year 1852. Fifty thousand salmon and trout ova were placed on board the ship *Columbus* on the 31st January, 1852. The result of this experiment was failure, owing to the high temperature to which the ova were exposed during the voyage, no provision having been made for the use of ice.

A second attempt was made in the year 1860. Ova were shipped on board the *S. Curling* in February of that year. A stock of ice was provided for the purpose of keeping down the temperature of the water in the apparatus in which the ova were placed; but after being at sea 59 days the last of the ice melted, and with the increased temperature the ova died.

A third experiment was tried in the year 1862. On the 4th of March the iron vessel *Beautiful Star* left London having on board 50,000 ova, placed in trays in a suspended apparatus, and provided with ice. The ice lasted till the 17th May; the temperature of the water consequently then began to rise, and the last of the ova died after being 74 days at sea and 80 days from the time the spawn was taken from the fish.

The attempt by the *Beautiful Star*, although not successful, proved, however, that the ova could retain its vitality, even under such adverse circumstances, for 74 days; and further experiments which were made in London in the years 1862-3, established the important fact that ova may be hatched safely after being buried in ice for 150 days. With the experience thus derived from the hitherto unsuccessful attempts, and from a better knowledge of the subject, it was felt that the introduction of Salmonidæ into Tasmanian waters was on the eve of being accomplished; and it was actually brought to a successful issue in the year 1864. On the 24th of January in that year the ship *Norfolk* sailed from London with about 90,000 salmon ova and 1500 trout ova, and provided with ice-house and ice. She arrived in Melbourne on 15th April. Eleven of the boxes containing the ova were left in Melbourne; the remainder, 170 in number, were forwarded to Hobart by the steamship *Victoria*, and arrived in the hatching establishment at the River Plenty on the 21st of April, 90 days after the ova had been shipped. On the 4th of May the first trout burst its egg; on the next day the first salmon; and by the 15th June it was estimated that there were about 3000 salmon fry. There is some doubt as to the exact number of trout fry, but there were probably about 300.

In August a leak leading from the Salmon Pond to the Plenty was discovered, through which it was ascertained that a large number of fry had escaped into that river.

In March, 1865, 419 salmon parr were liberated into the Plenty, many of them being 5 inches long. Fourteen of the smallest were retained in the pond, besides a number which could not be caught.

In October, 1865, the first salmon trout was seen in the pond, and between that time and the end of the year 35 smolts were liberated.

In January, 1866, thirty-eight brown trout were liberated in the Plenty, and 133 were retained in the clearing-pond.

In July, 1866, seventy-seven salmon parr were liberated, every fish showing distinctly the approaching change to the smolt form. These were the last of the shipment per *Norfolk*.

The attempt by the *Norfolk* having proved so successful, the Tasmanian Government wisely determined to obtain a second shipment of ova, and on the 8th of February, 1866, the ship *Lincolnshire* sailed from Plymouth having on board 103,000 ova of the salmon (*S. salar*), and 15,000 of the salmon trout (*S. trutta*). The ship was provided with ice-house, ice, and boxes in the same manner as the *Norfolk*. Upon the arrival of the *Lincolnshire* in Melbourne, the boxes containing the ova were forwarded to Hobart, where they arrived on the 4th of May, and the ova were placed in the hatching-boxes at the Plenty on the day following.

The proportion of living ova deposited was estimated at about 45 per cent. of the whole shipped.

On the 8th May, 1866, the first salmon ovum (per *Lincolnshire*) was hatched, and the first trout on the 12th of the same month. By the time all were hatched it was estimated that the numbers were 4490 salmon fry, and 496 salmon trout fry, besides a number of salmon fry which could not be counted, but which were estimated at about 1500.

In July, ova and milt were taken from the first pair of trout which arrived at maturity in Australian waters.

A few pairs of salmon trout were retained in a rill and pond purposely constructed for them, in the hope that spawn might be obtained without any previous migration to the sea.

In October, 1867, the majority of the parr from the ova ex *Lincolnshire* having assumed the smolt dress were allowed access to the Plenty; and in October, 1868, the remainder of these parr took their departure from the ponds.

The salmon ova sent to Tasmania were obtained from fish taken in the Rivers Ribble and Hodder in Lincolnshire, the Severn in Worcestershire, the Dovey in Wales, the Tyne in Westmoreland, and the Tweed in Scotland.

The salmon trout ova came from the Tweed, in Scotland, and the brown trout ova from the Wey, and from the Itchen and its tributaries.

Respecting the brown trout ova, Mr. Francis Francis, in a letter published in the *Field* in 1879, writes—"I was the person who supplied the trout ova, which . . . . came from Mr. Spicer's mill at Alton, on the Wey, and from Mr. Thurlow's mill at High Wycombe, Bucks. . . . A further consignment . . . . was sent by Mr. Buckland, from Admiral Keppel's water on the Itchen; the three lots being in somewhat equal quantities."

With respect to the brown trout, 133 in number, which were in the year 1866 retained in the clearing-pond at the establishment at the Plenty, their numbers have been added to from time to time, and it is from these fish and their progeny that the rivers of Tasmania, New Zealand, and Victoria have been successfully stocked. Large numbers have also been forwarded to New South Wales, South Australia, and Western Australia, but we have at present no authentic information as to whether *S. fario* has been acclimatised in these Colonies.

As to the few pairs of salmon trout which, in the same year, were kept back in the pond for breeding purposes, in the month of June, 1869, five pairs of these fish were observed forming redds in the shallows attached to their pool, and in October the shallows were alive with their fry. The pond was kept stocked by successive hatchings of ova until the year 1881, when the whole of the salmon trout then in confinement were liberated. This was done because a marked deterioration was observed in the quality of the fish, and because at last no fertile ova could be obtained from them. The result at any rate proves that at least one species of migratory salmonoid can be artificially retained and propagated in fresh water for a limited time; but whether such fish can ultimately accommodate themselves to a permanent sojourn in fresh water, the experiment at the Plenty would seem to negative. In Wales the same experiment has been tried with salmon and sewin, and in both cases, says Dr. Günther, the fish died when not allowed to return to the sea.

Ova obtained from the salmon trout kept back in the pond have been distributed throughout this Colony, New Zealand, and Victoria. It may be noticed here that, with respect to all the ova deposited at the ponds, that, whilst it is uniformly white, that collected in the Plenty presents every variation of colour from white to deep red.

The Derwent is the only river in Tasmania in which salmon fry and smolts have been liberated. Salmon trout fry have been placed in the Rivers Derwent, Huon, and South Esk.

As to brown trout, a reference to Table in the Appendix will show the rivers of Tasmania which have been stocked with these fish.

There is, we regret to report, evidence before us that, owing to the depredations of cormorants, as well as to certain illegal practices—such as the use of dynamite,—want of gratings in mill-races, and insufficient protection in some few of the northern rivers, the brown trout are on the decrease.

From the year 1869 to the year 1881 inclusive, 36,000 ova have been placed, and 57,190 fry liberated in Tasmanian Rivers; in the rivers of Victoria, 81,500 ova and 473 fry; in those of New South Wales, 24,500 ova; in those of South Australia, 20,000 ova; in the rivers of Western Australia, 800 ova; and in those of New Zealand, 18,350 ova. During the present year 24,000 have been applied for.

Such is a brief outline of the history of the introduction of Salmonidæ into Tasmanian—we may say Australian—waters, and of the steps which have been taken to ensure their propagation and distribution. We propose now to indicate generally the results of this highly interesting undertaking.

It will be borne in mind that, from the first shipment of ova, the first trout (*S. fario*) was hatched on the 4th day of May, 1864, and the first salmon (*S. salar*) the day following; and that, from the second shipment, the first salmon burst its egg on the 8th of May, 1866, and the first salmon trout (*S. trutta*) on the 12th day of the same month.

On the 15th March, 1867, the Superintendent at the Ponds reported that he had seen that day a salmon grilse about five pounds in weight jump out of the water in the Derwent about two miles from the breeding establishment at the Plenty.

In the month of June the same year, a male trout 19½ inches long, weighing 3½ lbs., was found dead in the Plenty.

In June, 1868, a brown trout 26 inches long, and 9½ pounds in weight, was caught in the Plenty. During the summer of 1868-1869, fish described as salmon grilse were constantly seen in the Derwent and Plenty. In October, 1869, two smolts 10 inches long were taken in a seine net two miles below Hobart, in perfectly salt water. One of these fish was forwarded to Dr. Günther for examination, and was pronounced by him to be a dwarfed example of *S. trutta*. In December, 1869, another but much larger fish was caught, and also forwarded for Dr. Günther's opinion. After minute examination, he found that it presented the usual characteristics by which the true salmon (*S. salar*) is distinguished from its nearest allies. In December, 1873, the reward of £30, which had been offered by the Government for the capture of the first grilse or salmon, was awarded to the captor of a fish caught near Bridgewater.

In the year 1874 numerous other English fish, believed to be grilse chiefly, were caught in graballs in the bays near Hobart.

On the 13th January, 1876, and four following nights, about 200 English fish, reported by the Salmon Commissioners to be smolts, were captured in seine-nets in that part of the estuary of the River Derwent known as Sandy Bay, about a mile below Hobart, in perfectly salt water. They varied in weight from ¾ to 1½ lbs.

In October, 1876, a fish reported by the Salmon Commissioners to be an undoubted salmon, and weighing 2¾ lbs., was captured with an artificial salmon fly near New Norfolk.

During the month of October in the years 1876 to 1880, small bright silvery fish, reported by the Salmon Commissioners as smolts, were observed in great numbers coming down the water-race which supplied the Ponds at the Plenty, evidently making their way to the sea. In the year 1879 migration they are said to have come down in millions. During the year 1879 captures of fish described as salmon, from 4 to 7 lbs. in weight, were made by fishermen in nets; one specimen upwards of 7 lbs. was taken in Storm Bay at a locality about 20 miles seaward of the parent river, the Derwent. Other Salmonidæ, as to the exact variety of which various opinions have been entertained, of over 20 lbs. in weight, but which we believe to have been *S. fario*, have been caught with rod and line. In addition to these a fine specimen, weighing 28 lbs., was found dead in the River Huon. This fish was seen by several anglers, and pronounced to be a brown trout. Another large specimen, also pronounced to be a brown trout, was caught at Latrobe: it weighed close on 23 lbs.

Early in the year 1880 the following fish were forwarded to Dr. Günther for examination:—No. 1, a specimen from the breeding-ponds at the Plenty, and believed to be a salmon trout (*S. trutta*); No. 2, some smolts from the River Plenty selected from the fish migrating to the sea as above described; No. 3, specimens caught in the estuary of the River Derwent (salt water), 35 miles below the breeding-ponds. These specimens were received and examined by Dr. Günther, who pronounced upon them as follows:—"No. 1 (a single specimen) is undoubtedly a young salmon; it has every one of the characteristics of *S. salar*, and as it seems to have been bred in Tasmania I have very great pleasure in congratulating you in your continued success. Nos. 2 and 3 are the same fish, sea trout (*S. trutta*); the internal organs are badly preserved; still, from the external appearance of the fish, I may safely conclude that my determination is correct."

In answer to the enquiry, then, as to what species of Salmonidæ have been permanently acclimatised in our rivers, there is no doubt as to *S. fario*; its introduction has been accomplished, and year after year ova from these fish are being more and more widely distributed. Fish of this species have been taken varying in size from the diminutive troutlet of ounces to that of the enormous specimen found dead at the Huon, 28lbs. An interesting fact connected with one variety of brown trout may here be noticed. In the letter of Mr. Francis Francis, to which we have before referred, that gentleman explains that some of the trout ova sent to Tasmania was obtained from High Wycombe, Bucks; and concerning these fish, Mr. Francis writes: "They are more like salmon than the common brown trout, and are brilliantly silver in colour, very short and thick in make, and weigh heavier for their length than almost any fish I know. . . . . They often run up to 7 or 8 lbs. weight; the flesh is not alone pink as that of a salmon, but is of much deeper red when at the height of condition." Now, in the brackish water of the Derwent at and below Bridgewater, and

also in the fresh water above New Norfolk, specimens of brown trout, short, thick, and weighty, of bright silver coloration, flesh of intense pink to deep red color, and in flavour almost equal to that of *S. salar*, have been taken. These fish are probably the descendants of the High Wycombe trout.

As to salmon trout, it will be recollected that in the year 1869, a specimen taken two miles below Hobart was examined by Dr. Günther and pronounced to be a dwarfed example of *S. trutta*, and that more recent specimens taken from the myriads of small migratory fish proceeding toward the sea, and the larger specimens captured in the salt water of the Derwent, have been by the same high authority adjudged to be salmon trout. Fish, too, corresponding in general external appearance and size to *S. trutta*, are constantly taken during the season. The acclimatisation of this species therefore, can now be considered an accomplished fact.

Regarding the introduction of *S. salar*, the evidence of its success is not quite so clear. It is satisfactory, however, to find that specimens sent to England for examination have been pronounced to possess the characteristics of true salmon, and the successful acclimatisation of this fish from the ova already received may now, perhaps, be a mere matter of time. We might, however, have expected that ere this a large specimen of *S. salar* would have been captured.

Further, there is evidence to show that many varieties of the Salmonidæ found in our rivers do not fall within the exact classification of either *S. salar*, *S. trutta*, or *S. fario*, possessing at times the distinguishing marks of more than one of the three species.

It is a mistake with some to consider our fine migratory fish, whether regarded as *S. salar*, *S. trutta*, *S. cambricus*, or *S. brachypoma*, to be a destructive or inferior fish. On the contrary, it is a splendid fish, at any rate not inferior to the grilse of the true *S. salar*. The name 'bull trout' is in Great Britain applied indifferently in various places to several species of the genus *Salmo*; and in the Beaulieu and Ness is even applied to the spent male fish of the true *Salmo salar*. To use such a term with reference to our migratory fish is certainly misleading, and would not be adopted by any one who knew our fish or who had the slightest experience in ichthyology.

There can be no doubt that those colonists who originally conceived, and, to the extent we have reported, carried out the idea of acclimatising the Salmonoids in Tasmania, were influenced by enlightened and far seeing views. They foresaw the great gain which would certainly accrue to the revenue of the Colony by the establishment of a new industry. The fact was obvious to them as it is to us now, that we have many noble rivers swelled by numerous tributaries untenanted by indigenous fish of any economic value, but teeming with small fry and other animal life suitable for the sustenance of a family of fishes of great commercial value; and it was equally clear to them that neglect to stock Tasmanian rivers with suitable foreign fishes was precisely the same thing as if the Colony possessed vast tracts of pastoral lands producing luxuriant grasses, and refused to utilise them. Our rivers are just as suitable in every respect for the successful culture of the *Salmo salar* as those of Scotland and Ireland; and seeing the great value of the salmon fisheries in these countries (viz., Scotland, £750,000, and Ireland, £500,000, annually), there is no reason why Tasmania should not turn to account to some extent now, and largely in the future, the great natural resources which her rivers and temperate climate thus place at her disposal. The thanks of the whole Colony are due to the gentlemen who originated this undertaking. It is to be regretted that their praiseworthy efforts have not been more adequately followed.

That which was in pisciculture in the year 1862 merely tentative has now almost become certainty. Annual shipments of the ova of the *S. salar* should be forwarded to this Colony until the introduction of this species is beyond the region of doubt. The facilities for preserving the vitality of the ova during the voyage from England are now so great that success is almost sure, while the expense is but trifling; and we recommend that the Legislature should be asked to vote the necessary amounts which may from time to time be required.

An important question of this kind is a national matter, and should not be treated as the special interest of any one class of the community.

#### *Perch.* (*Perca fluviatilis*.)

Perch were introduced into Tasmania by the Messrs. Allport in the year 1862. Being a hardy kind of fish, they were simply placed in aquariums in the cabin of the vessel by which they were imported. The fish (eleven in number) upon arrival were confined in a small pond, and the ova and fry which were in due time obtained have been distributed throughout this and other Colonies. They are now abundant in some of the shallow weedy lakes and lagoons of this Colony, but do not appear to have thriven in our rivers, except in places where the water happens to flow sluggishly. In the warmer waters of Victoria they have succeeded much better. There a great number of lakes and rivers have been stocked by the ova and fry of six perch which were received at Ballarat by one of us who was then resident in that city, from the late Mr. Morton Allport, on the 19th July, 1868.

The following extracts from the Report of the Ballarat Fish Acclimatisation Society, dated the 4th August, 1874, illustrates the remarkable growth and increase of *Perca fluviatilis* (as also of brown trout) in the waters of Australia :—

“Perch were first placed in Lake Wendouree in the season of 1870—1871, (that lake being dry in the previous season), and this season it is estimated, and reasonably too, that not less than 10 tons of fish have been taken therefrom since 1st November last, and we exhibit one now on the table caught last December in Wendouree weighing 3½ lbs., and only 4 years old.

The trout which is in the same jar was hatched and placed in Lake Learmonth in October, 1872, was washed up on a shallow on the banks of the lake last December, (1873), being barely 16 months old, and weighing 2½ lbs. The facts relating to these two specimens are beyond doubt, because in the one instance Wendouree was dry in 1869 and beginning of '70, and in the other no trout whatever were in Lake Learmonth until placed there by the Society in 1872.”

#### Carp. (Cyprinidæ.)

Tench (*Tinca vulgaris*) were introduced into Tasmania by the late Captain Langdon, and have permanently established themselves, and are numerous in the still waters of such rivers as the Clyde, South Esk, and the Jordan, especially where weeds are plentiful.

The golden carp (*Carassius auratus*) and the crucian carp (*C. vulgaris*), have also been successfully acclimatised.

### VIII.—DEVELOPMENT OF GENERAL FISHING INDUSTRY.

We now come to the consideration of the remunerative development of our fisheries by means of extended markets, preserving processes, and improved appliances for the capture of the valuable fishes permanently located in our waters, or visiting our coasts at certain seasons in vast quantities.

It has not been found possible to obtain information as to the value of preserved fish in their various forms imported into the Colony annually, but there can be little doubt that a large sum is expended in this direction to supply our tables with an article provided by nature within easy reach of our fishermen.

The sprat (*Clupea sprattus*), anchovy (*Engraulis antarcticus*), kingfish (*Thyrsites solandri*), and barracouta (*Thyrsites atun*), mackerel (*Trachurus trachurus*), trevally (*Caranx georgianus*), all visit our coasts at certain seasons in great numbers, and could be captured if there was inducement to do so; as it is, some of these species come and go unmolested, and almost unheeded. These fish appear one and all to be capable of preservation in the different forms which industry has devised, and could be delivered at the manufactory at a small cost. We have it in evidence that a valuable fish like the kingfish (*Thyrsites solandri*) would, when plentiful, be remunerative to the fisherman if he could ensure 3s. a dozen for all brought to market—a price which appears to offer a large margin for profit to the preserver. Others of our fishes (school and surface fish), such as the sprat and anchovy, are not captured, the fishermen not having even the necessary appliances for the purpose, although if a ready sale for these were established it would possibly make it worth their while to procure the gear suitable for the work.

The experiment of fish preserving has already been tried on a small scale in Hobart, and, notwithstanding the disadvantages arising from the want of skilled labour and suitable appliances, combined with the first introduction of a novel and unknown product on the market, it has been demonstrated that such an industry can be attended with profit—remunerative prices having been obtained for good samples sent to the neighbouring Colonies. The large and rapidly increasing population on the Australian Continent, if the produce of our waters should not even extend further, would appear to offer in itself a field for the introduction and profitable sale of our fish if preserved in a wholesome and palatable form; and we have the satisfaction of being able to report that the Manager of the Tasmanian Preserving Company has been authorised by his Directors to try the experiment of preserving some of our best fish when the proper season arrives; and it may be that, with the advantage of proper appliances and skilled labour, the experiment will result in the establishment of the industry in the Colony.

The price at which our best of fishes, the trumpeter (*Latris hecateia*), is procurable, renders it doubtful whether it could be profitably preserved for export or home consumption. Being a deep-sea fish, caught only with the hand-line, the labour attending its capture is such, that it always commands a high price, and the limited local market tends rather to deter our fishermen from submitting to the exposure and risk attending this pursuit. The extent of water in which this fish is at present sought is limited, but the opinion of experienced persons is that the range of the fish around our coasts is but very partially explored, and that the present known grounds if fully worked are sufficient to meet the demands. It becomes important, therefore, to consider what steps might lead to the development of this branch of the trade by extending the market, thereby inducing fishermen to go in search of new grounds, in larger and more suitable boats, provided with wells of a greater carrying capacity than those generally in use. The trumpeter lives better and longer in a well than any other of our known fishes, but having to be fished for in the open sea, the opportunities for lying at the fishing-grounds are necessarily liable to interruption from wind and sea, and it therefore



becomes important that having come upon the fish in favourable weather, the most should be made of the occasion, and as large a freight secured as possible. As, however, the home market would be easily glutted, it is not to be expected that those engaged in the industry will make any great effort to increase the supply unless some other outlet is provided. The boats at present in use are, with few exceptions, open well-boats,—many of them admirable specimens of their class, although not adapted for operations at any considerable distance from shore, or for making passages to the adjacent Colonies with the fruits of their labour. It is understood that larger fishing smacks or ketches sailing from our port find an immediate and ready remunerative sale for any number of these fish which they can take into the Melbourne market.

Hobart, from its proximity to the fishing-grounds, offers the natural harbour for our fishing fleet, in frequent communication by steamer with Melbourne and Sydney; and we are of opinion that if at any time the intercolonial steamers should be led to construct refrigerating chambers in their vessels plying between Hobart and Melbourne, at least whereby the finest of the fishes to be obtained in our waters could be conveyed in a thoroughly sound and fresh condition to the Victorian markets, that it would be the means of developing our fisheries to a very large extent, and lead to considerably increased energy being thrown into the industry.

The construction of a tramway across East Bay Neck, whereby the freight of fishing boats could be transported from the sea shore of the neck in Blackman's Bay to Norfolk Bay, the boats thus avoiding the long and sometimes difficult passage round Capes Pillar and Raoul, has been suggested as a great help to fishermen. We are of opinion that it would be a question worthy of the consideration of the Government whether they might not institute further enquiries as to the practicability of the suggestion. The contemplated representation of this Colony in the International Fisheries Exhibition to be held in London in 1883, we hope may lead to many important improvements in modes of capture, processes of preservation, and even in the utilisation of marine products now unknown or unsought.

#### IX.—RECAPITULATION.

In concluding this Report it may be desirable to give a brief summary of the several matters treated of at large under the classified headings. These consist generally of descriptions, comments, suggestions, and recommendations. Some of the latter are addressed to those immediately concerned with the particular industry, while others are of such a character as may only be dealt with by the Legislature of this Colony. Taking the order of classification adopted, we may proceed to recapitulate as follows:—

I. *Introductory*.—Under this head we have given very fully a sketch of the extent and of the mode under which our enquiry has been conducted.

II. *Our Fishes*.—Under this head is to be found a general description, with a list, of our principal fishes and their habitats,—including, 1. Fishes Proper, 2. Crustacea, 3. Mollusca, 4. Whale Fisheries.

This chapter also contains many suggestions which may advantageously be considered by those immediately concerned with particular branches of the fishing industry—more especially with respect to Ostreiculture.

III. *Fishing Industry*.—Under this head is given a brief sketch of the number of men, boats, and equipment employed in our fishing industry, together with an outline of the principal fishing-grounds, and the estimated yearly value of equipment and fish sales—exclusive of the Whale Fishery.

IV. *Markets*.—Under this head we give an account of the existing market, market laws, the mode of conducting sales, the supervision in matters relating to undersized and unwholesome fish, with special reference to the lack of a proper fish market in Launceston. It also contains a recommendation to the effect that a proper system of record of fish brought to market and sold, either for home consumption or export, be instituted both at Hobart and Launceston.

V. *Protection of our Fisheries*.—Under this head we have at considerable length pointed out the great destruction to the young of our native fish by the operations of the ground seine-net. With respect to this most objectionable and destructive mode of capturing fish, it is strongly recommended for the protection of our important fisheries that, within declared nursery grounds, the use of the ground seine-net should be prohibited absolutely; and that beyond such restricted grounds it should be made imperative that the seines be emptied in the water, and not drawn up upon the beach as at present, causing the needless destruction of myriads of young fry, to the injury of the general fishing industry. It is also recommended that the present restrictions as regards netting in the upper waters of the Derwent be maintained, as it has not only proved most beneficial to the valuable introduced fishes, which have now fairly established themselves in our waters and are becoming very abundant, but also to the estuary fish, which have greatly increased within the protected limits, and where, moreover, the young of all fishes ascend in myriads during summer for food and protection.

The limits of the restricted ground *per se* have also received our careful consideration; and we are of opinion that, in the meantime, it would be advantageous to our general fishing industry that they should not be disturbed.

We also recommend that where fixed or stake nets are used, for capture of fish or otherwise, that they should be restricted, as they are in the neighbouring Colonies, as follows, viz.:—They should be kept clear of weed; should be prohibited from being stretched completely across any creek, river, or inlet; and the minimum size of the mesh should be four inches.

We also recommend that, for the better carrying out of the existing fishery laws, that additional supervision be provided, especially better local supervision over the more important spawning-grounds during the spawning season.

With respect to crayfish, it is recommended that the capture and sale of fish under 10 inches, together with females with ova attached, should be prohibited. It is also recommended in respect of oyster fisheries, that it be made imperative to distribute the “culch” evenly over the beds when dredged, and not thrown down in heaps, as is now the prevailing custom, to the permanent injury of this most important industry.

With respect to the reported injury to the fishing industry of Tasmania by boats from other Colonies, we have shown from enquiries that, although their practice of capturing crayfish by so-called lobster-pots is perhaps objectionable, yet in other respects the only injury done is confined to competition for the Victorian market, wherein our own fishermen and exporters certainly suffer a loss to some extent. It may be a matter requiring consideration whether boats belonging to other Colonies should be allowed to freely compete with the local industry within the Tasmanian waters; but in any case it would be difficult to determine the limits within which they carry on their calling especially as regards trumpeter fishing.

We have also shown that in New South Wales, with the view of restoring some of the more exhausted fishing-grounds, power has been vested in the Governor to close entirely for a period of years particular bays, lakes, and inlets; and we recommend that similar powers be vested in the Governor with respect to this Colony.

We also recommend that, for the better protection of the fisheries of the Colony generally, the general administration, control, and direction of all matters relating to sea and inland fisheries be vested in one Central Board, working under the Governor in Council; and that a skilled Inspector be appointed to carry out the Regulations to be fixed from time to time by the said Board.

VI. *Fishery Laws*.—Under this head is given a brief epitome of the existing laws relating to fishes in Tasmania, grouped under the following heads:—

1. Limits as regards places and times of fishing and close seasons.
2. Limits as regards size, &c. of fish which may be captured.
3. Authorised modes of capture.
4. Instruments, engines, injurious substances, &c. prohibited absolutely.
5. Instruments, &c. prohibited within particular localities.
6. Other provisions.
7. Oyster Fisheries.

It has been observed that there is a great necessity for some more definite provision by law or treaty in the event of protection being considered necessary in respect of the more distant fishing banks around the coasts of the Colony.

VII. *Pisciculture and Acclimatisation*.—Under this head is given a sketch of the history of the successful introduction of the Salmonidæ and other fishes of Great Britain into Tasmanian waters. The valuable character of the migratory salmonoids is commented upon. The frequent depreciatory statements made with respect to them, as being an inferior and destructive fish, is most unfounded, and has been shown to have arisen from the mistaken use of the word “bull trout,” which is a common term in Great Britain applied indifferently in various places to several species of the salmonidæ, and in some cases it is even applied to spent fish of the true *Salmo salar*. The necessity of regarding the acclimatisation of the important members of the salmon family as a matter of wide national importance, and not a mere class or sportsman’s interest, is insisted upon.

It has been shown, in a general way, that it would be a matter for deep regret if the lofty aims of the original promoters of acclimatisation should be narrowed down, and lost sight of, through the inconsiderate action of those whose opinions have been formed without sufficient care.

The further importation of salmon ova is recommended; the great obstacles already overcome, and the present measure of success, being sufficient justification for further effort in this direction.

VIII. *The Development of our Fishing Industry.*—Under this head we discuss the several matters which may lead to the expansion of our local fishing industry. Among these, considering the great wealth in our waters,—consisting of shoals of sprats, anchovies, and periodical schools of kingfish, &c., which during certain seasons may be caught in numbers vastly exceeding the local demand,—it is contemplated whether there might not be here sufficient inducement for the establishment of a preserving or curing industry, if properly managed. It has been shown that, owing to the absence of establishment or enterprise of this kind, that the local fishermen confine themselves to particular fish and to particular modes of capture; whereas, if inducement were offered to them to extend their supply in a new direction, or even according to existing modes, a very great expansion of the important industry would immediately follow.

With respect to ostreiculture, it might be of much advantage if greater security were given to good cultivators in the working of particular beds. Where a single proprietor, or a company, has an exclusive right to a particularly defined ground over a sufficiently extended period, it is to his or their interest to work it in the most approved manner. The industry, in our opinion, can only improve in this way. General licences to fish for oysters should be prohibited as a rule.

Accessibility to important fishing-grounds during stormy weather, beyond Cape Raoul, has also received attention. It may be a matter for consideration whether boat-trams across East Bay and Eagle Hawk Necks may not be constructed, not merely for the better supply of the market, but for the safety of boats and the preservation of the lives of a hardy and industrious section of our community.

The possibility of preserving our export fish in prime condition on arrival in the markets of the neighbouring Colonies has also been discussed. It is suggested that it might be advantageous if the Intercolonial trading steamers were to fit up refrigerator chambers in their vessels between Hobart and Melbourne. If this could be done the advantage to our local fishing industry would, indeed, be very great.

We also state that the contemplated representation of this Colony in the International Fisheries Exhibition to be held in London in 1883 may lead to many important improvements in the modes of capture and processes of preservation, and even in the utilisation of valuable marine products now unknown or unsought.

In conclusion, it is gratifying to us to acknowledge the cordial manner in which our numerous correspondents throughout the Colony have responded to our enquiry circulars, in supplying information, and otherwise assisting us in the prosecution of our labours.

We have specially to offer our thanks to the Honorable William Macleay, of New South Wales, whose experience and kind advice in such matters have been of so much service to us.

We only hope that our own labours which are now brought to a close may be of some service in promoting the welfare of the fishing industry of this Colony.

Given under our hands and seals at Hobart, in Tasmania, this twenty-fifth day of September, 1882.

MATTHEW SEAL, <i>Chairman.</i>	(Seal.)
CURZON ALLPORT.	(Seal.)
ROBT. M. JOHNSTON.	(Seal.)
A. RIDDOCH.	(Seal.)
JOHN SWAN.	(Seal.)
A. G. WEBSTER.	(Seal.)
C. T. BELSTEAD.	(Seal.)
EDWARD D. SWAN.	(Seal.)

PHILIP S. SEAGER, *Secretary.*

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GENERAL AND CRITICAL OBSERVATIONS

ON

THE FISHES OF TASMANIA;

WITH A

CLASSIFIED CATALOGUE OF ALL THE KNOWN SPECIES.

BY

ROBERT M. JOHNSTON, F.L.S.,

FELLOW OF THE ROYAL SOCIETY OF TASMANIA, AND OF THE LINNEAN SOCIETY  
OF NEW SOUTH WALES, &c.

## GENERAL AND CRITICAL OBSERVATIONS ON THE FISHES OF TASMANIA.

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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 *Salmonidae* 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.
Linnæus .....	17 ditto.
Castelnau .....	10 ditto.
Johnston .....	10 ditto.
Various authors (25) ....	57 ditto.

TOTAL ..... 188

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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 .. ..	<i>Ammotretis rostratus.</i>
The Flounder ..	<i>Rhombsolea monopus.</i>
Garfish .....	<i>Hemirhamphus intermedius.</i>
Mullet .....	<i>Agonostoma Forsteri.</i>

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 hecateia.</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 .....	<i>Latris hecateia.</i>
The Rock Gurnet .....	<i>Sebastes percoides.</i>
The Black and Silver Perch	<i>Chilodactylus macropterus.</i>
The Real Bastard Trumpeter	<i>Mendosoma Allporti.</i>

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 .....	<i>Thyrsites atun.</i>
The Kingfish .....	<i>Thyrsites solandri.</i>

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.

\* 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.

### 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.—

	Family.	Genus.	Species.	Common to Australia.	Common to N. Zealand.
1	Percidæ	Lates	colonorum	•	
2	"	Microperca	Tasmanicæ		
3	Triglidae	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	Muraenidæ	Anguilla	australis	•	
14	Petromyzontidæ	Mordacia	mordax	•	
15	"	Gentria	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 1½ 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 Frank-*

*linii*), 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 'honey-suckle,' (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 maræna*, the Freshwater Herring, or Cucumber Fish, although rarely exceeding ¾ 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 by rod and line,—a fly-hook baited with a “gentle” seems to be the mode of capture in greatest favour among sportsmen.

*Retropinna Richardsons*, 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. Richardsons* 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. Cuning*, 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.—

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

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*—Ribbles 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 intro-



duction to our waters of the following well known European fishes:—

The River Perch .....	<i>Perca fluviatilis.</i>
The Common Tench .....	<i>Tinca vulgaris.</i>
The Crucian Carp .....	<i>Carassius vulgaris.</i>
The Golden Carp .....	<i>Carassius auratus.</i>

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 22½ 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 22½ 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.

### BERYCIDE.

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 rasor* .... 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 Tasmanian Pike (*Lanioperca mordax*, Günth.) and 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.

## SQUAMIPINNÆ.

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, smoked, dried, or salted. Many, indeed, consider the smoked Trumpeter equal, if not superior, to the Finnon Haddock of Scotland (*Gadus aeglefinnis*). 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 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,—

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

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

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 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. br. s.	V.	L. lat.
(1)	17:1-37	3-29	17 = 9 8	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.

\* 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.

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 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:—

	<i>C. spectabilis.</i>	<i>C. Allporti.</i>
Height of body in total length—times .....	more than 3 times	2½-2¾
Longest ray of simple pectorals .....	1st	2nd
Head contained in total lengths .....	4½ 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 Bichenor. 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 *Triglidae* has been divided into two,—the Gurnet group, under the name *Scorpenidae*; and the Flathead and Flying Gurnard group, under the name *Cottidae*.

#### 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.

#### SCIENIDÆ.

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 is 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 ½d. 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 Mc'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.

This 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 . . . . . *Naucratus 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 expect 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, ATERINIDÆ.

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 Scamander 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 $\frac{1}{4}$  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—

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 ..... *Trachypterus 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 mane-like 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 those, *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

\* 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.



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 2½ 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 to be again 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 greater 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 of 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 4d. to 9d. 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 Conwayi*, 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 Richardsonsii*, 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 . . . . .	<i>Engraulis encrasicolus</i> , var. <i>Antipodum</i> , L.
The Sprat . . . . .	<i>Chupea sprattus</i> , L.
The Pilchard . . . . .	<i>Chupea sagax</i> , 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:—

<i>Callorhynchus antarcticus</i> ,	
Lacep. ....	The Elephant Fish.
<i>Carcharias glaucus</i> , L. . .	The Blue Shark.
<i>Galeus canis</i> , Rondel. . . .	The Tope, or School Shark.
<i>Zygana malleus</i> , Shaw . .	The Hammer-headed Shark.
<i>Mustelus antarcticus</i> , Günth.	Smooth-head.
<i>Lamna cornubica</i> , Flem. .	Porbeagle or Blue Shark.
<i>Odontaspis Americanus</i> ,	
Mitch. ....	The Grey Nurse.
<i>Alopias vulpes</i> , L. ....	Thrasher.
<i>Notidanus indicus</i> .	
<i>Scyllium maculatum</i> ....	Spotted Sea Snake.
<i>Scyllium laticeps</i> . ....	The Sea Snake.
<i>Parascyllium variolatum</i> ,	
Dum.	
<i>Crossorhinus barbatus</i> , L.	Wobbigong.
<i>Heterodontus Phillipii</i> ,	
Lacep. ....	Port Jackson or Bull-head Shark.
<i>Acanthias vulgaris</i> , Risso.	Spotted Spiny Dog.
<i>Acanthias Blainvillii</i> , I. .	Spiny Dog.
<i>Rhina squatina</i> , L. . . . .	The Angel Shark.
<i>Pristiophorus cirratus</i> ,	
Latham . . . . .	Saw-fish.
<i>Pristiophorus nudipinnis</i> ,	
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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- 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 I. *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 SOME OF THE PRINCIPAL TERMS, SYMBOLS, AND ABBREVIATIONS USED IN THE FOLLOWING CLASSIFIED CATALOGUE.

## 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 *jugal*; 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 *bifurcate*; 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 CIRRHETIDE—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. LOPHOBANCHII. 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.)

## 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. 166. Without barbels. 70. (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; first D. feeble, elevated; all rays of P. branched. SCLENIDÆ—IX.
- " 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. PERCIDÆ. 70.  
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.

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

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.
38. 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. HAPLOCHTONIDÆ—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. MURÆNIDÆ—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. SCOMBROSOCIDÆ—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—XLIII. (Type, Elephant Fish, *Callorhyncus 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. TRYGONIDÆ—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. GYMNOBONTES—XLII.

## CLASSIFIED CATALOGUE OF TASMANIAN FISHES.

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 *Trumpeter* (*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. GLYPHTAUCHEN 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. *PENTAROGHE MARMORATA*, Cuv. et Val. (A.) *The Soldier*.  
B. 7. D. 12-18:10. 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 4½ to 5½ 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 *Nomeidae* and *Cyttidae* 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, 8½ inches; length of snout, 4 inches; length of pectoral fin, 5½ inches; length of anal fin, 5½ inches (not reaching to vent as in Dr. Günther's figure; greatest depth, 9 inches; least depth, 1 inch; breadth of eye, ¾ inch; distance of extremity of maxillary from snout, 4 inches; distance of 1st ray of posterior dorsal from snout, 20¼ 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 McCoy (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*.

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.

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 Shippack*.

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. laevis* 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. ATHERINICHTHYS 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 BOTHRYCOSMUS, 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,—the Blue-head being preferred to all the others.
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			7½	1¾	4-3
(2)	7	12 : 26	3-18	17			6½	1½	4-0
(3)	7	12 : 26	3-18	17			5½	1¾	4-4
(4)	7	12 : 28	3-18	17			10¾	2½	4-7
(5)	7	12 : 26	3-18	17			8	1¾	4-9
(6)	7	13 : 26	3-18	17			8½	1¾	4-3
(7)	7	11 : 27	3-17	17			5¾	1½	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 4½ times in total length, and greatest depth 4½ 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, 2½ inches; length of snout, ¼ inch; length of barbel, ¾ inch; breadth interorbital space, ¾ inch; longest ventral ray, 1½ inches; longest anterior dorsal ray, 1 inch (3rd and 4th); longest posterior dorsal ray, ¾ inch; longest anal ray, ¾ inch; greatest depth of body, 2¾ inches; least at caudal peduncle, ¾ inch; snout to termination of first dorsal, 9½ inches; snout to termination of anal, 9½ inches; snout to first ray of anterior dorsal, 2¾ 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. *PIERASFER HOMEI*, Rich.  
 B. 7. Vertical fins continuous, very low.  
 Günth Cat., IV., p. 382. Macl. Cat., 774. Alp. 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. Alp. 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. Alp. 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. Alp. 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. Alp. 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 MARINA*, 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. Alp. 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 extinc-  
 tion 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, 1½ 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. Alp. 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, *White-*  
*bait*. 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 some-  
 what obtuse, as in *S. trutta*, although in all other respects  
 many individuals agree more closely with its noble con-  
 gener, *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 speak-  
 ing, *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, 1½ to 1¾; 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; parr  
 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. (I.) *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, 9½ in.; body, 8½ in.; head, 2½ in.; snout, ¾ 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. Macl. 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, 4½ 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 vertebrae and ribs. Specimen 2½ 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.  
(*Antarcticus*.)

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, Bruny 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. *CLUPA 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 NYCTHEMERUS*, 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. *ZYGENA 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 LATIGERS*, 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. *PARASCYLLIUM 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. *Wobbegong*.

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. TRYGONORHINA FASCIATA, Mull and Henle. *The Fiddler*. 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 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. MYLIOBATIS 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).

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 .....	3½ "
Head .....	1½ "
Greatest depth .....	1½ "
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.

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REV. J. E. TENISON WOODS, F.L.S., &c. :  
Fish and Fisheries of New South Wales. Sydney, 1882. (213 pp.)

# FISHERIES COMMISSION.

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## APPENDICES.

- A. Rules, Fish Market.
- B. Return Fishing Boats and Crews.
- C. Return of Fish exported.
- D. Fish Sales, Hobart Market.
- E. Decennial Return—Whaling Industry.
- F. Return showing Revenue from Sale of Ova and Fishing Licences.
- G. Return—Distribution of Ova and Fry from Salmon Ponds, River Plenty.
- H. Return of Streams containing Salmonoids.
- I. Letter as to protection of the River Derwent, and suggestions thereon.
- J. Letter of the Honorable William Macleay, Sydney.
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1. E. Stutterd, Table Cape.	15. William Taylor, Spring Bay.
2. W. H. Oldaker, Burnie.	16. Joseph J. M'Clusky, ditto.
3. William Chapman, Torquay.	17. James Watkins, ditto.
4. Thos. Barnard, River Tamar.	18. John Evenden, Port Arthur.
5. Richard F. Irvine, ditto.	19. E. A. Walpole, Franklin.
6. James Richardson, George Town.	20. Henry J. Daldy, Gordon.
7. A. K. Chapman, Bridport.	21. William Young, Ralph's Bay.
8. W. L. Boyes, George's Bay.	22. C. Purdy, Macquarie Harbour.
9. Henry Dawson, ditto.	23. Caleb J. L. Smith, Deloraine.
10. — Cooper, Seymour.	24. Henry Martin, Exton.
11. Frank M. Gill, Swansea.	25. Gooch Fowell, Westbury.
12. Edward O. Cotton, ditto.	26. Wm. Hogg, Longford.
13. H. Harvey, Bicheno.	27. Thos. B. Blyth, Ross.
14. J. Lyne, Glamorgan.	28. N. P. Allison, Bothwell.

EXTRACTS FROM MINUTES OF PROCEEDINGS.

TUESDAY, 21ST FEBRUARY, 1882.

*Members present.*—The Honorable Charles Hamilton Bromby, John Swan, Esq., Matthew Seal, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq., Alexander George Webster, Esq.

On the motion of Mr. Swan, it was resolved—That the Hon. C. H. Bromby do take the Chair at this meeting. The Commission was read.

On the motion of Mr. Johnston, it was resolved—That Mr. Matthew Seal be Chairman of the Commission.

On the motion of Mr. Swan, it was resolved—That Mr. Philip Samuel Seager be recommended to the Government for appointment as Secretary to the Commission.

Mr. Johnston submitted suggestions as to evidence, circulars, and other matters relating to the work of the Commission.

TUESDAY, 28TH FEBRUARY, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Alexander George Webster, Esq., Curzon Allport, Esq., Alexander Riddoch, Esq., Robert Mackenzie Johnston, Esq.

The Minutes of the last meeting were read and confirmed.

A letter was read from the Colonial Secretary approving the appointment of Mr. Seager as Secretary.

Mr. Johnston submitted a List of the Fishes of Tasmania.

On the motion of Mr. Johnston, it was resolved—That in order to meet expenses in connection with witnesses and other incidental expenses, it is desirable that a sum of One hundred Pounds be placed at the disposal of the Commission.

TUESDAY, 14TH MARCH, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Alexander George Webster, Esq., Robert Mackenzie Johnston, Esq., The Honorable Charles Hamilton Bromby, Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

A letter was read from the Colonial Secretary that £100 would be placed on a Supplementary Estimate to meet the expenses of the Commission.

Mr. Johnston submitted draft circular, with tabulated form, which was approved, and the Secretary instructed to have same printed, and distributed among persons distant from Hobart.

It was resolved—That Messrs. Charles Torrens Belstead and Edward Daniel Swan be nominated to the Government for appointment as Members of the Commission.

Mr. William Mason, City Inspector, examined.

TUESDAY, 21ST MARCH, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Alexander George Webster, Esq., Alexander Riddoch, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq., John Swan, Esq., The Honorable Charles Hamilton Bromby.

The Minutes of the last meeting were read and confirmed.

Mr. Joseph Barnett examined.

TUESDAY, 28TH MARCH, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Curzon Allport, Esq., John Swan, Esq., Alexander Riddoch, Esq., Robert Mackenzie Johnston, Esq., Alexander George Webster, Esq.

The Minutes of the last meeting were read and confirmed.

Mr. R. M. Johnston's List of Tasmanian Fishes was ordered to be printed.

Mr. Joseph Barnett's examination was continued.

TUESDAY, 4TH APRIL, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Curzon Allport, Esq., John Swan, Esq., Alexander George Webster, Esq., Robert Mackenzie Johnston, Esq., The Honorable Charles Hamilton Bromby.

The Minutes of the last meeting were read and confirmed.

Mr. Joseph Barnett's examination was continued.

WEDNESDAY, 12TH APRIL, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Curzon Allport, Esq., John Swan, Esq., Alexander George Webster, Esq., Alexander Riddoch, Esq., Robert Mackenzie Johnston, Esq.

The Minutes of the last meeting were read and confirmed.

Replies to Circulars were received from Messrs. S. H. Grueber, Fingal; J. Richardson, George Town; J. C. Lord, Oatlands; H. Dawson, St. Helen's; T. B. Blyth, Ross; W. Gibson, jun., Perth; W. Hogg, Longford; H. Martin, Exton.

Mr. Joseph Barnett's examination was continued.

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MONDAY, 17<sup>TH</sup> APRIL, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Curzon Allport, Esq., John Swan, Esq., Robert Mackenzie Johnston, Esq., The Honorable Charles Hamilton Bromby.

The Minutes of the last meeting were read and confirmed.

Mr. Barnett's examination was continued.

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TUESDAY, 25<sup>TH</sup> APRIL, 1882.

*Members present.*—Alexander George Webster, Esq. (in the Chair), Curzon Allport, Esq., Robert Mackenzie Johnston, Esq., Alexander Riddoch, Esq., The Honorable Charles Hamilton Bromby.

The Minutes of the last meeting were read and confirmed.

Replies to Circulars were received from Messrs. J. T. Ritchie, Deloraine; W. L. Boyes, St. Helen's; J. Lyne, Swansea; Caleb J. L. Smith, Deloraine; J. Evenden, Port Arthur.

The examination of Mr. Joseph Barnett was concluded.

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TUESDAY, 2<sup>ND</sup> MAY, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Alexander George Webster, Esq., Edward Daniel Swan, Esq., Charles Torrens Belstead, Esq., Curzon Allport, Esq., Robert Mackenzie Johnston, Esq.

The Minutes of the last meeting were read and confirmed.

A letter was read from the Colonial Secretary notifying the appointment of Messrs. Charles Torrens Belstead and Edward Daniel Swan as Members of the Commission.

Replies to Circulars were received from Messrs. G. Fowell, Westbury; C. J. Mackenzie, Burnie; J. W. Norton Smith and R. A. Murray, Emu Bay.

Mr. Robert Smith, fisherman, examined.

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WEDNESDAY, 10<sup>TH</sup> MAY, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Alexander George Webster, Esq., Edward Daniel Swan, Esq., Charles Torrens Belstead, Esq., Robert Mackenzie Johnston, Esq., John Swan, Esq., Robert Cartwright Read, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

Mr. Robert Smith's examination was concluded.

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FRIDAY, 12<sup>TH</sup> MAY, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Robert Mackenzie Johnston, Esq., Alexander Riddoch, Esq., Charles Torrens Belstead, Esq., Curzon Allport, Esq., John Swan, Esq., Alexander George Webster, Esq., Edward Daniel Swan, Esq.

The Minutes of the last meeting were read and confirmed.

Replies to Circulars were received from Messrs. Anderson, Circular Head; and Purdy, Macquarie Harbour.

Mr. Thomas Hadley, fisherman, was examined.

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THURSDAY, 18<sup>TH</sup> MAY, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Robert Mackenzie Johnston, Esq., Edward Daniel Swan, Esq., Alexander George Webster, Esq., Charles Torrens Belstead, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

Reply to Circular was received from Mr. W. H. Oldaker, Emu Bay.

Mr. William Ikin examined.

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MONDAY, 22<sup>ND</sup> MAY, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Edward Daniel Swan, Esq., Robert Mackenzie Johnston, Esq., Alexander George Webster, Esq., Charles Torrens Belstead, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

Mr. Francis Rush, fisherman, examined.

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WEDNESDAY, 31<sup>ST</sup> MAY, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Robert Mackenzie Johnston, Esq., John Swan, Esq., Alexander George Webster, Esq., Robert Cartwright Read, Esq., Curzon Allport, Esq., Edward Daniel Swan, Esq.

The Minutes of the last meeting were read and confirmed.

Replies to Circulars were received from Messrs. N. P. Allison, Bothwell; E. O. Cotton, Swansea; and — Hawkins, South Bruni.

Mr. Andrew Charles Kirk examined.

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THURSDAY, 1ST JUNE, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Robert Mackenzie Johnston, Esq., Edward Daniel Swan, Esq., Alexander Riddoch, Esq., Charles Torrens Belstead, Esq., Alexander George Webster, Esq., Curzon Allport, Esq., John Swan, Esq.

The Minutes of the last meeting were read and confirmed.

Messrs. William Saville and James Morris examined.

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MONDAY, 5TH JUNE, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Edward Daniel Swan, Esq., Charles Torrens Belstead, Esq., John Swan, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

Mr. Francis Rush, fisherman, further examined.

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MONDAY, 12TH JUNE, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Edward Daniel Swan, Esq., Charles Torrens Belstead, Esq., John Swan, Esq., Curzon Allport, Esq., Robert Mackenzie Johnston, Esq.

The Minutes of the last meeting were read and confirmed.

Replies to Circulars were received from Messrs. Walpole, Franklin; H. Harvey, Bicheno; and — Cooper, Seymour.

Mr. John Brown examined.

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WEDNESDAY, 14TH JUNE, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Charles Torrens Belstead, Esq., Alexander George Webster, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

Mr. John Brown further examined.

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THURSDAY, 15TH JUNE, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Alexander George Webster, Esq., Alexander Riddoch, Esq., Curzon Allport, Esq., Charles Torrens Belstead, Esq., Robert Mackenzie Johnston, Esq.

The Minutes of the last meeting were read and confirmed.

Mr. William Henry Martin, fisherman, examined.

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WEDNESDAY, 21ST JUNE, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Alexander Riddoch, Esq., Robert Mackenzie Johnston, Esq., Alexander George Webster, Esq., Charles Torrens Belstead, Esq., John Swan, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

Replies to Circulars were received from Messrs. R. F. Irvine, Launceston; Thomas Davis, South Bruni; Thomas Barnard, Windermere; N. Poole, Deloraine.

On the motion of Mr. Webster, it was resolved—That application be made to the Government for an extension of two months' time in which to bring up the Report of the Commission.

On the motion of Mr. Johnston, it was resolved—That the £100 placed at the disposal of the Commission by the Government be drawn from the Treasury and deposited in the Commercial Bank to an Account "Royal Commission Fisheries," to be drawn upon by cheques signed by the Chairman and one other Commissioner.

Mr. William Henry Martin, fisherman, further examined.

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FRIDAY, 23RD JUNE, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Alexander George Webster, Esq., Alexander Riddoch, Esq., Charles Torrens Belstead, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

Mr. John Swan examined.

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WEDNESDAY, 28TH JUNE, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Robert Mackenzie Johnston, Esq., Alexander Riddoch, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

Messrs. William Green and George Peacock examined.

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THURSDAY, 6TH JULY, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Alexander George Webster, Esq., Alexander Riddoch, Esq., Robert Mackenzie Johnston, Esq.

The Minutes of the last meeting were read and confirmed.

Reply to Circular was received from Mr. William Chapman, Torquay.

Mr. John Swan further examined.

MONDAY, 10TH JULY, 1882. *Launceston.*

*Members present.*—Matthew Seal, Esq. (Chairman), Alexander George Webster, Esq., John Swan, Esq., Robert Mackenzie Johnston, Esq., Hardwicke Weedon, Esq., Richard Francis Irvine, Esq.

The Minutes of the last meeting were read and confirmed.

Replies to Circulars were received from Messrs. F. M. Gill, Swansea; and W. East, Leven.

Messrs. Henry Milner, E. L. Ditcham, and William Harrison examined.

TUESDAY, 11TH JULY, 1882. *Launceston.*

*Members present.*—Matthew Seal, Esq. (Chairman), Alexander George Webster, Esq., John Swan, Esq., Robert Mackenzie Johnston, Esq., Hardwicke Weedon, Esq., Richard Francis Irvine, Esq.

The Minutes of the last meeting were read and confirmed.

Messrs. Hugh Fraser, R. F. Irvine, and C. W. Rocher examined.

THURSDAY, 27TH JULY, 1882. *Bridgewater, 9 A.M.*

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Alexander George Webster, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq., Alexander Riddoch, Esq.

The Minutes of the last meeting were read and confirmed.

Messrs. J. H. Dickenson, W. H. Thomson, and John Cooley examined.

THURSDAY, 27TH JULY, 1882. *Salmon Ponds, 2 P.M.*

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq., Alexander George Webster, Esq., Alexander Riddoch, Esq.

The Minutes of the last meeting were read and confirmed.

Mr. John Stannard examined.

THURSDAY, 27TH JULY, 1882. *New Norfolk, 7 P.M.*

*Members present.*—Matthew Seal, Esq. (Chairman), Alexander George Webster, Esq., Robert Mackenzie Johnston, Esq., John Swan, Esq., Curzon Allport, Esq., Alexander Riddoch, Esq.

The Minutes of the last meeting were read and confirmed.

Mr. John Stannard further examined.

Messrs. James Lumsden, Octavius Blockey, and William Wise examined.

THURSDAY, 3RD AUGUST, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), Alexander George Webster, Esq., John Swan, Esq., Curzon Allport, Esq., Alexander Riddoch, Esq., Charles Torrens Belstead, Esq.

The Minutes of the last meeting were read and confirmed.

Replies to Circulars were received from Messrs. H. J. Daldy, Three Hut Point; and W. Young, Droughty Point.

Mr. William Whitehouse, fisherman, examined.

WEDNESDAY, 9TH AUGUST, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Alexander George Webster, Esq., Alexander Riddoch, Esq., Robert Mackenzie Johnston, Esq., Charles Torrens Belstead, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

Replies to Circulars were received from Messrs. A. K. Chapman, Bridport; and William Taylor, Joseph J M'Cluskey, and James Watkins, Spring Bay.

It was resolved that the Chairman and Mr. Johnston be a Sub-Committee to examine Circulars, &c. for publication in Report.

Discussion took place as to the heads of the Report; and the drafting of chapters was allotted as follows:—

I. Introduction to Report .....	Mr. Johnston.
II. Our Fishes—	
1. Fishes Proper	} .....
2. Crustaceæ	
3. Mollusca	
4. Whale Fisheries.....	Mr. Webster.
III. Fishing Industry .....	Mr. Johnston.
IV. Markets .....	} .....
V. Protection of our Fisheries	
VI. Fishery Laws .....	Mr. J. Swan.
VII. Pisciculture and Acclimatisation.....	Mr. Allport.
VIII. Development of our Fishing Industry generally .....	Chairman and Mr. Allport.
IX. Recapitulation.....	Mr. Belstead.
	Mr. Johnston.

FRIDAY, 11TH AUGUST, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Alexander George Webster, Esq., Robert Mackenzie Johnston, Esq., Charles Torrens Belstead, Esq., Curzon Allport, Esq., Alexander Riddoch, Esq.

The Minutes of the last meeting were read and confirmed.

Mr. Curzon Allport examined.



TUESDAY, 15TH AUGUST, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Alexander George Webster, Esq., Charles Torrens Belstead, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

Letters were received and read as to the Conservancy of the River Derwent, in which suggestions were made with reference thereto.

The Draft Introduction to Report was submitted, and was read and adopted.

WEDNESDAY, 16TH AUGUST, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Alexander George Webster, Esq., Charles Torrens Belstead, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq., Alexander Riddoch, Esq.

The Minutes of the last meeting were read and confirmed.

Reply to Circular was received from Mr. E. Stutterd, Burnie.

Messrs. Charles Purdy and Henry Lloyd were examined.

THURSDAY, 24TH AUGUST, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Curzon Allport, Esq., Alexander George Webster, Esq., Alexander Riddoch, Esq., Robert Mackenzie Johnston, Esq.

The Minutes of the last meeting were read and confirmed.

Mr. Allan McCall examined.

THURSDAY, 31ST AUGUST, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Alexander George Webster, Esq., Alexander Riddoch, Esq., Robert Mackenzie Johnston, Esq., Charles Torrens Belstead, Esq.

The Minutes of the last meeting were read and confirmed.

The chapters of the Report, "Fishes," and "Acclimatisation and Pisciculture," were read, and, after discussion and modification, were adopted.

MONDAY, 11TH SEPTEMBER, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Alexander George Webster, Esq., Curzon Allport Esq., Charles Torrens Belstead, Esq., Robert Mackenzie Johnston, Esq.

The Minutes of the last meeting were read and confirmed.

The chapter of the Report, "Protection," was read, and, after considerable discussion, its adoption was postponed.

The chapter of the Report, "Whale Fishery," was read and adopted.

TUESDAY, 12TH SEPTEMBER, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Robert Mackenzie Johnston, Esq., Charles Torrens Belstead, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

The chapter of the Report, "Protection," was further considered, and, after alteration and addition, was adopted.

The chapter of the Report, "Development of General Fishing Industry," was read, and its consideration postponed.

MONDAY, 18TH SEPTEMBER, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Alexander George Webster, Esq., Alexander Riddoch, Esq., Charles Torrens Belstead, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

The chapter of the Report, "Markets," was read and adopted.

The chapter, "Development of General Fishing Industry," was considered and adopted.

The Chairman and Mr. Johnston were appointed a Committee for the purpose of revising the various Chapters of the Report for final adoption.

FRIDAY, 22ND SEPTEMBER, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Alexander George Webster, Esq., Alexander Riddoch, Esq., Charles Torrens Belstead, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq.

The Minutes of the last meeting were read and confirmed.

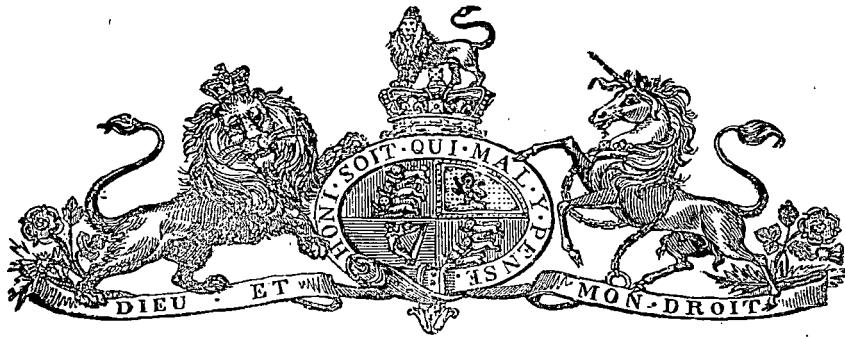
The chapters of the Report on "Crustaceæ," "Mollusca," "Fishing Industry," and "Fishery Laws" were read and adopted.

MONDAY, 25TH SEPTEMBER, 1882.

*Members present.*—Matthew Seal, Esq. (Chairman), John Swan, Esq., Edward Daniel Swan, Esq., Charles Torrens Belstead, Esq., Alexander Riddoch, Esq., Robert Mackenzie Johnston, Esq., Curzon Allport, Esq., Alexander George Webster, Esq.

The Minutes of the last meeting were read and confirmed.

The Report was finally read, adopted, and signed by the Members present.



## FISHERIES COMMISSION.

### MINUTES OF EVIDENCE.

TUESDAY, 14TH MARCH, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, Curzon Allport, Esq., R. M. Johnston, Esq., Alexander G. Webster, Esq., the Hon. C. H. Bromby.

MR. WILLIAM MASON, *City Inspector*, examined.

1. *By Chairman*.—My name is William Mason.
2. I am City Inspector.
3. My duties in connection with the Fish Market are to see the Regulations carried out, and no unwholesome fish sold.
4. I produce the Rules of the Fish Market. (Appendix A.)
5. I go to the Fish Market at 6 in summer and 7 in winter, according to the Rules.
6. I leave as soon as the market is over, sometimes half-past 6, sometimes 7, according to the number of fish in the Market.
7. The Fish Market is let on lease to Joseph Barnett for one year.
8. It is let annually.
9. Joseph Barnett is Clerk of the New Market.
10. It is the duty of the Clerk of the Market to see the Rules obeyed.
11. (Rule 1. read.) This Rule is not carried out as to perishable fish, such as seine fish, not sold in the Market they being afterwards sold at the Wood Wharf. This is not a common occurrence.
12. I keep no record of fish brought to Market under Rule 1.
13. The Clerk of the Market keeps an account of fish sold on behalf of fishermen, for which he has a per-centage from them.
14. There is no official record kept.
15. All fish brought to market are inspected by me.
16. I do not inspect fish kept in the boats and not exposed for sale.
17. *By Mr. Johnston*.—The laws could thus be evaded.
18. *By Chairman*.—The only means to be adopted to enforce Rule 1 would be by summoning offenders.
19. *By Mr. Johnston*.—No such case has occurred.
20. I don't think that Rule 1 is evaded.
21. *By Chairman*.—I know the laws relating to flounders sold less than 9 inches, and English salmon 20 inches.
22. No oysters are brought to the Fish Market for sale.
23. I can't say whose duty it is to prevent the sale of undersized fish out of the Market. I consider it my duty to prevent their sale in the market.
24. Oysters are not exposed for sale in the Market. There are no Colonial oysters coming up.
25. *By Mr. Johnston*.—I would not consider fish bought by contract as coming within Rule 1.
26. *By Chairman*.—I never see any oysters come to market.
27. Rule 1 in respect of oysters has not been carried out.
28. I do not know, but it is possible, that undersized salmon are frequently offered for sale in Hobart.
29. If Rule 1 were literally obeyed this could not be.

30. *By Mr. Johnston.*—Crayfish are all sold at the Market.
31. The Rules apply to crayfish.
32. *By Chairman.*—I have had occasion to condemn fish as unwholesome. They are destroyed by the Market authorities.
33. During 1881 a very small quantity was condemned.
34. There is dreadful waste on account of the sale of crayfish. There is no prohibitory size.
35. *By Mr. Johnston.*—Fishermen can sell them of any size, and large quantities of undersized crayfish are at times brought for sale.
36. I have often seen them exposed with the young attached.
37. *By Mr. Allport.*—I do not enter the boats, and I only inspect fish after landing if offered for sale.
38. After the market is over, it is possible for fishermen to sell their fish from the boats. As a fact they do so.
39. Having paid the Market dues, they consider they have a right to sell.
40. They pay per boat, irrespective of catch of fish.
41. *By Mr. Johnston.*—Selling fish out of a boat is not in compliance with Rule 1.
42. The Fish Market is the enclosure as now fenced.
43. Some vessels could not come to the Market, as they are too large.
44. Fish, such as barracouta and kingfish, have been sold outside without being brought into the Market, but all small fish are brought into the Market.
45. I have only power to inspect fish offered for sale in the Market or adjacent thereto.
46. I have no power to enter the boats.
47. *By Mr. Bromby.*—Supposing a sale of fish from one boat to another, you would not see the fish? Such a thing might happen, but I do not think it does. I never heard of such an instance.
48. When fish are sold from the boats the fish are brought into the market or adjacent to the Market.
49. *By Mr. Allport.*—Fish for export are shipped direct from the boats.
50. *By Mr. Johnston.*—They are not for sale in Hobart.
51. *By Chairman.*—I could not say what quantity of fish go through the Market.
52. *By Mr. Johnston.*—My not having power to enter the boats might be the means of unwholesome fish being sold.
53. I have not thought of any rules that might be laid down for preservation of fish, except what I have said as to crayfish.
54. There is a rule as to flounders, which might be evaded by the boats not landing the fish.
55. If some one were appointed to inspect the boats this might be avoided.
56. *By Mr. Allport.*—I have nothing to do with inspection of nets, or any matters outside the market.
57. I think it would be objectionable to license the men instead of the boats.
58. *By Mr. Johnston.*—I do not think the boats are licensed specifically as fishing boats. I can see no advantage in thus licensing them.
59. Most of the boats are regularly employed in fishing. Some are let, and others belong to the men themselves.
60. At certain seasons some of the boats are employed in bringing wood and fruit to town.
61. *By Chairman.*—I cannot at the present time suggest any improvement in the Regulations, but will think the matter over.

## TUESDAY, 21ST MARCH, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, Alexander G. Webster, Esq., A. Riddoch, Esq., *M.H.A.*, R. M. Johnston, Esq., Curzon Allport, Esq., John Swan, Esq., the Hon. C. H. Bromby.

MR. JOSEPH BARNETT, *Clerk of the New Market, examined.*

62. *By Chairman.*—My name is Joseph Barnett; I am lessee of the Fish Market, and have been so for the last two years and three months.
63. I am Clerk of the New Market, and as such manage the Fish Market.
64. I am sworn as a Constable.
65. I open the Market at 6 A.M. from October to 1st April, and at 7 A.M. from April to October. The Market is closed each day at sundown.
66. Fish are brought to the Market in boats, and handed up in baskets.
67. They are sold by auction by the fishermen; each man is his own auctioneer.
68. I am clerk to two-thirds of the men, and book their sales. The sales for the others are booked by Mr. Turner; none book for themselves.

69. No record is kept by me as Clerk of the Market of the number and description of fish sold.
70. All fish brought for sale are exposed to view in the Market.
71. If prices are not good in the market fish are not brought out of the boats; such fish are alive.
72. Mullet and other fish are sometimes sold at the wharf, but they are all seen by me.
73. *By Mr. J. Swan.*—Nearly all the boats are well-boats.
74. *By Chairman.*—I have condemned fish as unwholesome. I don't think any were condemned last year.
75. I have been oystering and seineing since 1846 to within the last ten years, and have been continually dealing in fish since.
76. I know the laws relating to oysters, but not as to flounders or salmon, but I believe the limit as to size of these fish is marked on the flags in the market; we frequently measure such fish to see if they are undersized.
77. I would prevent the sale of them if brought to market. I did prevent the sale of some flounders last week.
78. *By Mr. J. Swan.*—I ordered them to be put back in the water: they were alive. I took no further steps.
79. *By Mr. Johnston.*—I know of only two kinds of flounders, viz., sole and flounder; there may be a third, got on a sandy bottom.
80. I have seen soles of various sizes; they are not now one-half the size they were formerly.
81. The full sized sole (*Annotretis rostratus*) is now only about ten inches.
82. The length of a flounder, (*Rhombsolea monopus*) in body, is about the same size as a sole.
83. The flounder, from sandy bottom, (*Rhombsolea tapirina*) is a narrower fish, but as long as other flounders.
84. I would prevent the sale of flounders in their close season.
85. I know the close season of oysters, but not of salmon.
86. I have not known undersized salmon and flounders sold in the market. I can't say whether they have been sold in Hobart.
87. I do not inspect the boats to see if unwholesome or undersized fish are kept out of sight.
88. I have no power to enter the boats.
89. *By Mr. J. Swan.*—I have never read the Act as to flounders; I have heard of such an Act but have never seen it.
90. *By Chairman.*—I believe fish are sold in Hobart which have not passed through the market.
91. The market is supposed to be open all day. They might be brought there after the market is opened and I would not see them. If a boat arrives after the market is over, they sell the fish but pay the market fees. They seldom sell all their freight.
92. I consider the market sale over in about an hour and a half, when I leave, and do not return that day.
93. *By Mr. J. Swan.*—A sort of retail business goes on all day at the boats.
94. *By Chairman.*—These fish are not inspected.
95. The fish usually sold at the market are bastard trumpeter, real trumpeter, mullet, salmon, crayfish, perch, flathead, carp, rockcod, conger eels, ling, flounders, soles, gurnet—these are brought in all the year round. Garfish, April to October; barracouta, November to August; silver-fish or trevallie, midwinter; snottgall, March to May; king-fish, December to October; bream, October to February or March; black bream, same; horse mackerel, January to April; red perch in winter; whiting in summer; sand mullet, do not know the season.
96. I know the real bastard trumpeter (*Mendosoma Allporti*).
97. *By Mr. J. Swan.*—I have not known 100 black bream (*Girella tricuspidata*) brought to Hobart in my experience.
98. *By Mr. Webster.*—I have seen them in millions at Twofold Bay,—not on the Tasmanian coast.
99. *By Mr. J. Swan.*—I cannot give any information as to English mackerel (*Scomber Australasicus*). I remember about 8 years ago when they came up the Derwent in shoals in the summer.
100. *By Mr. Johnston.*—I have seen sprats (*Clupea sprattus*) come up the Derwent in 1845; no great shoal since then. I have not heard of shoals being seen round the coast since then. Fishermen have seen shoals of small fish, but have taken no notice of what they were.
101. I have not seen the anchovy (*Engraulis antarcticus*) come up here.
102. I have seen and got whitebait (*Retropinna Richardsoni*)—generally in summer—not in large quantities; they are not brought to market.
103. None of these small fish are brought to market.
104. *By Chairman.*—The principal localities for trumpeter lie between Macquarie Harbour and Seymour, round the Southern coast; I have never caught them in Bass's Straits.
105. Crayfish (*Palinurus Lalandii*) are caught all round the island. I have not fished them all round the island, but have caught them from Recherche to Cape Portland.
106. Mullet (*Agonostoma Fosteri*) are caught all round the island.

107. Garfish (*Hemirhamphus intermedius*) pretty well distributed; have caught them up as far as Swanport and as low as Recherche.

108. Perch (*Chilodactylus macropterus*) all round the island. I have caught them off the islands in the Straits, off Kent's Group. I have got them at Eddystone Point.

109. Bastard trumpeter (*Latris Forsteri*) all round the island. In winter they are caught in deeper water than in summer. I have got them with graballs in 18 fathoms on the coast above Bream Creek.

110. *By Mr. J. Swan.*—It is not usual for Hobart fishermen to set their graballs in deep water.

111. *By Chairman.*—Barracouta (*Thyrssites atun*) between Whale's Head and Port Arthur. This is the principal fishing ground for this market.

112. Kingfish (*Thyrssites solandri*) between Fortescue and Recherche.

113. Carp (*Chilodactylus spectabilis*), the same as bastard trumpeter.

114. Trevallie (*Caranx Georgianus*), or silver fish, caught in seines between Recherche and Norfolk Bay, and on East Coast.

115. *By Mr. J. Swan.*—I know the magpie perch (*Chilodactylus gibbosus*); it comes into market occasionally.

116. *By Chairman.*—Mackerel (*Trachurus trachurus*), Recherche and round the East Coast.

117. Flounders, flathead, and rockcod (*Rhombsolea*, *Platycephalus*, *Pseudophycis*,) all round the island.

118. Bream (*Chrysophrys Australis*), (silver or Brown's River),—I have caught them between Southport and Bay of Fires on East Coast.

119. Black bream, Southport and where there are fresh water rivers. I do not know if they are caught on the East Coast.

120. Eels (*Anguilla Australis*; *Conger vulgaris*,) all round the island.

121. Red perch (*Anthias rasor*) caught in the locality of trumpeter.

122. Whiting (*Sillago ciliata*) along the East Coast and in the Derwent.

123. Sand-mullet (*Mugil dobula*?) at Southport.

124. Crabs all round the island.

125. I do not know how many boats are engaged in fishing. I have eight of my own. I can supply you with that information.

126. The principal fishing-grounds are from Macquarie Harbour to Maurouard Island, off George's Bay.

127. I cannot state the usual prices of fish sold in the market; they vary. Each kind of fish are sold in the market in separate lots.

128. I could give a return of fish sold in the market, their quantity and value, but it would take some time to prepare.

129. There are two or three fish shops in Hobart.

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## TUESDAY, 28TH MARCH, 1882.

*Present*—Matthew Seal, Esq., (*Chairman*), Curzon Allport, Esq., John Swan, Esq., A. Riddoch, Esq., M.H.A., A. G. Webster, Esq., R. M. Johnston, Esq.

### MR. JOSEPH BARNETT'S examination continued.

130. *By Chairman.*—I export fish. I will furnish a return of the number and value of fish exported by me.

131. The fish for Hobart market are usually captured by net and line.

132. Among the most experienced fishermen I name Frank and Thomas Rush, George Maine, William Veal, James Gower, John Bolton, and Robert Smith.

133. I do not know the spawning season of any Tasmanian fishes.

134. The supply of fish is not so large now as formerly. I cannot account for the decrease. The fish used to come in in heavy shoals; they do not come in so now.

135. *By Mr. Allport.*—All the fish have fallen off.

136. White-bellied trumpeter (*Latris Forsteri*) at Wedge Bay have fallen off. I cannot account for it. The only reason I can suggest is, that it has been overfished.

137. They are migratory, and not to be had in winter.

138. I have known them to be got in March in boat loads, and after April none to be had. They would not then be got before the following spring.

139. They have steadily decreased each year.

140. *By Mr. Riddoch.*—I think this is caused by overfishing.

141. *By Mr. Allport.*—The fishing-grounds for them are reef grounds.

142. I think they leave these grounds for deep water.
143. I think in the winter they go north.
144. *By Mr. J. Swan.*—The fishermen divide the common bastard into two kinds—white fish and red.
145. I never knew of white fish being heard of far away from land.
146. I have known men fishing for real trumpeter but have caught bastards—not white fish—3 or 4 miles off land; off the Pillar an odd one.
147. Red fish are caught on the same grounds as the white.
148. I never saw a red fish fat.
149. I never saw a white fish lean.
150. I think from their shape and form they are two separate fish.
151. I do not think the condition would account for the difference in shape; the head of the white fish is small, and that of the red fish long.
152. I never saw roe or milt in a bastard trumpeter.
153. I do not know where they spawn.
154. *By Mr. Allport.*—I do not think they come to shallow water to spawn.
155. We get younger fish in shallow water.
156. *By Mr. J. Swan.*—The smallest sized bastard trumpeter is 3 or 4 inches in length.
157. I have seen them often caught in seines,—as many as a bushel at a draw.
158. Their appearance at the smallest stage is blueish on back, white on belly, streak between the blue and white marks.
159. I have never seen the white fish small.
160. *By Mr. Allport.*—The reason the fish go north is on account of temperature.
161. They have forsaken all known grounds in quantity.
162. I know no way by which they may be preserved.
163. On the reefs where they are caught there are not strong currents. If a great current is running the nets could not be set.
164. The bastard trumpeter are all taken by nets.
165. *By Mr. J. Swan.*—The use of graballs has been general for about 2 or 3 years.
166. Since their use the fishermen have fished places not fished previously.
167. Notwithstanding the greater number of men fishing, and the new grounds worked, there are fewer white-bellied bastards brought in, but not fewer red bastard trumpeter brought to market.
168. It was in the summer, from November to March, that I have seen the small bastards brought in.
169. They are also called “paper fish.”
170. *By Chairman.*—The graball nets are made on a  $2\frac{1}{2}$  in. and  $2\frac{1}{2}$  in. gauge; this would be  $4\frac{1}{2}$  and 5 inches on the stretch. They run as long as 30 fathoms: at one time they were 16 fathoms, average depth 5 to 6 feet.
171. The same sized mesh is used all the year.
172. It would be better to fix the size of fish to be sold rather than the mesh of nets.
173. *By Mr. J. Swan.*—There would be no difficulty in converting these graballs into seines.
174. *By Chairman.*—The usual mesh for seines is 1 in. in the wings and shoulders: on the bunt about  $\frac{3}{4}$  in. in summer, and very little over  $\frac{1}{2}$  in. in winter: the length is about 60 fathoms, and depth from 6 feet in wings to 18 ft. in bunt; all straight,—none used with a purse.
175. *By Mr. Allport.*—I think a system which would compel the nets to be emptied in water and not drawn on to the shore would be desirable; this would give the small fry a chance of escape.
176. *By Mr. J. Swan.*—In fishing the rivers on sandy beaches there has been great destruction of small fish, such as small flounders, paper-fish, &c.; which we always left on the beach. I have known us leave bushels of small rock-cod on the beach at Sandy Bay and other places.
177. *By Mr. Allport.*—Set nets should not be allowed to enclose rivers or creeks so as to bar the passage of fish.
178. I have never heard or known of a purse-net being used in our waters.
179. I have known of a trawl net; it was used in Adventure Bay, South Arm, and, I think, in Wedge Bay. The result was not good.
180. The ground tried was not suitable.
181. I have not known drift nets used, nor any net for taking shoals of fish off the coast.
182. *By Mr. J. Swan.*—The seine and graball, or set net, are the only nets used here.
183. *By Chairman.*—These are used around the East Coast.
184. The use of seine nets causes the destruction of spawn and young fish; a  $1\frac{1}{2}$  inch gauge would prevent this.
185. I have heard of dynamite being used for the capture of fish, but not by professional fishermen. This should be prevented by law.
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TUESDAY, 4TH APRIL, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, Curzon Allport, Esq., John Swan, Esq., A. G. Webster, Esq., R. M. Johnston, Esq., the Hon. C. H. Bromby.

MR. JOSEPH BARNETT'S *examination continued.*

186. *By Chairman.*—I hand in a Return of the number of Fishing Boats classified, their crews, &c. (Appendix B.)

187. *By Mr. Johnston.*—Referring to my answer 152—I never saw a roe or milt in the white or silver bastard trumpeter (*Latris Forsteri*?)

188. I have noticed that a white mass of fat appears near the vent. Although I have opened many fish I have never seen roe or milt imbedded in the fatty mass.

189. As the milt or roe invariably is either wholly or partially covered by the white fatty mass, may not this account for your opinion that the fish is barren? (Specimen of roe produced.) I have never seen anything like the specimen produced in the white bastard at this time of the year. The knife generally splits the fat.

190. I have never seen any fatty mass in the red bastard.

191. I do not find the red and white bastards in equal numbers on the same grounds.

192. The red favors a weedy bottom near shore, white bastards are caught on a reefy shore.

193. Referring to answer 164—The bastards do not readily take bait, with the exception of an odd one now and then taken on a trumpeter ground.

194. I have seen paper-fish caught, mostly in Ralph's Bay; the white bastard has not been seen in this locality, nor within a mile or two of it. The small fish are caught in shoal water. I do not think the spawning ground was near the spot where these small fry were destroyed.

195. *By Chairman.*—I know the real trumpeter (*Latris hecateia*); they are usually caught by hook and line,—sometimes with nets. The bait used is crayfish, until the fish come round, then shark or some other hard substance.

196. Some persons are of opinion that the big trumpeter are not the same species as the small trumpeter. The small trumpeter are caught in shallow water; the larger are taken in water from 10 to 50 fathoms.

197. The big fish are found with spawn fully developed in August and September; they shed their spawn at the end of September. I do not know where they spawn.

198. *By Mr. Johnston.*—I know a fish named the western trumpeter; it is an olive-colored fish.

199. They are caught in from 7 to 15 fathoms water off the land. They have a different appearance to the black trumpeter. I have never seen mature spawn in them. They are a shallow water fish; I have never known them caught more than half a mile from land.

200. I do not know their food.

201. The real trumpeter I have caught 3 or 4 miles off land; the greatest depth 30 to 50 fathoms.

202. I do not know their food.

203. The black trumpeter is found in shallow water, the large fish generally on a coral bottom.

204. The bottom is rock upon which the small fish are found. The western trumpeter is found on the east and west, but on different kinds of bottom from the large yellowish trumpeter.

205. We call the black trumpeter school fish.

206. The fishermen test the bottom with heavy sinkers and grease, and upon indications of coral bottom they drop their lines for trumpeter. Such coral reefs are found at various depths, from 10 to 50 fathoms.

207. *By Mr. J. Swan.*—The boats which take real trumpeter are—all the first-class; some of the second—most of them; none of the third class.

208. I have known the *Dagmar*, *Alice Maud*, and the *Rachel Thompson* employed in fishing for other colonies. I do not consider them Tasmanian smacks.

209. They fish for trumpeter and cray-fish.

210. There is no duty on Tasmanian fish in Melbourne market—only market dues.

211. These boats pay no licence fee; I think they should.

212. I consider that our fisheries are materially damaged by the operations of these vessels; we used to send 7 or 8 boats up to Seymour which do not go there now.

213. *By Mr. Webster.*—I do not think there are fewer trumpeter caught on the coast, but fewer come to this market.

214. *By Mr. Bromby.*—The Victorian boats come within two or three miles of shore on to the fishing grounds, the nearest ground being within about half a mile off shore.

215. *By Mr. Webster.*—Fishing for real trumpeter is carried on all the year round in different localities.

216. *By Mr. Johnston.*—I know three different kinds of perch: the black perch (common fish) (*Chilodactylus macropterus*), the sand or silver perch (*C. macropterus*), and the deep water perch (?). I also know the magpie perch (*Chilodactylus gibbosus*), and the red perch (*Anthias rasor*).

217. I think the black and silver perch are different fish; they are got on different grounds.

218. The skin of the red perch (*Anthias rasor*) is reddish; there is a small black spot behind the pectoral fin.

219. The deep water perch is very large, with big eyes, caught in deep water. A great many used to be brought to market. I do not know why they are not now brought to market. They are caught on the trumpeter ground, but are scarce.

220. I know of no other kind of perch on these coasts.

221. *By Mr Webster.*—The fishermen do not care to carry deep water perch in their wells, as they prick the other fish; they keep them, however, if they catch them.

222. *By Mr. Johnston.*—The ground upon which the trumpeter is caught is not favourable for deep water perch.

223. *By Mr. J. Swan.*—The silver perch has no internal fat like the black; it has a larger head, and is caught in shallow water on sandy bottom.

224. *By Mr. Johnston.*—The black perch is invariably fat. Some fishermen prefer it to a real trumpeter.

225. I find roe and milt in the big deep-water perch, and also in the black perch; the roe is mature in August, September, and October.

226. The carp (*Chilodactylus spectabilis*) is caught on the same grounds as the red bastard. I know of only one form. It is caught with graballs. The number brought to town is not numerous.

227. The real bastard (*Mendosoma Alporti*) is captured with graballs, and runs in schools. I have known them caught at the Schoutens and at Bicheno in large numbers. They are only good when full of roe.

228. *By Mr. J. Swan.*—I myself have never known them but when full of spawn. They were never called "buglers" here.

229. *By Mr. Johnston.*—Rock gurnet (*Sebastes percoides*) are frequently brought to market, and are caught while fishing for trumpeter; they are one of the indications of a trumpeter ground.

230. I have seen some of a darker color; we know them by the same name.

231. I know two or three species of flathead (*Platycephalus*); they are known as the red, the rock, and the common, caught on sandy bottoms.

232. The common (*Platycephalus bassensis*) are brought in greatest number to market, because they are most abundant.

233. It is an important fish in the market, from its quality and also from its great abundance.

234. *By Mr. J. Swan.*—I have seen the pike (*Lanioperca mordax*) in the market occasionally.

235. *By Chairman.*—The flathead are usually caught with rod and line.

236. The trumpeter are brought to market in well-boats. They feed when in the wells.

237. *By Mr. J. Swan.*—I have known them kept in wells for two months; they feed upon boiled crayfish.

238. The bastard trumpeter will live in wells, but will not take food. I know no other fish which will feed like real trumpeter.

239. *By Mr. Johnston.*—I know the trevally but not the mackerel trevally (*Neptonemus dobula*).

240. The fishermen fish for the snotgall but not for the trevally. There is the mackerel snotgall, and the snotgall (*Neptonemus brama*). I have caught them with the seine in shoals in Twofold Bay.

241. These have not of late years been brought to this market. I have known them fish for them but not to get them.

242. The size of the largest mackerel trevally is about a foot in length; the largest snotgall, 2 feet to 2 feet 6 inches,—they would weigh from 12 to 14 lbs.

243. The mackerel trevally is the better fish for food.

244. The season is March and April.

245. I know the English mackerel (*Scomber australasicus*). The fishermen do not bring them to market here.

246. I think they fish for them properly; they catch them with a net. They are school fish.

247. I have never known them to come in here, except one year. I think they would take the hook.

248. *By Chairman.*—I do not think they appear on our coasts every year. Horse mackerel do (*Trachurus trachurus*).

249. *By Mr. Johnston.*—I know only one kind of whiting (*Sillago ciliata*).

250. I have not seen one with black spots along the middle of the body.

251. The whiting are very valuable market fish. I have caught them in November, December, and January, in seines. They have been abundant, but not recently.

252. I cannot account for their decrease, except that they do not fish on the same grounds now.

253. I have caught them on the other side of Ralph's Bay Neck. I do not think they are there now, because none come to market, although that ground has been fished since.

254. The heaviest whiting is about a  $\frac{1}{2}$  of a lb.



WEDNESDAY, 12TH APRIL, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, Curzon Allport, Esq., John Swan, Esq., A. G. Webster, Esq., Alex. Riddoch, Esq., *M.H.A.*, R. M. Johnston, Esq.

MR. JOSEPH BARNETT'S *examination continued.*

255. *By Chairman.*—I hand in a Return showing Quantities and Values of Fish exported by me from 1872 to 1881, inclusively. (Appendix C.)

256. The reason I assign for the falling off in crayfish is the number of small fish taken, and those taken with spawn.

257. I do not know where the barracouta (*Thyrsites atun*) spawn. The young fish are taken in the bays.

258. Barracouta are brought to market in large quantities; about one half of them are exported.

259. They are caught with a jig.

260. There is a ready sale for these fish. The average price is 3s. per dozen; this is the standard price.

261. *By Mr. Webster.*—The average weight of each fish is from 9 to 10 lbs.

262. *By Mr. Johnston.*—The barracouta prey on the small fry, sometimes a small lobster, anchovy, sprats, &c. I never saw a young salmon in one, but I have seen a large mullet a foot or fifteen inches long. As a rule, I do not think they prey on larger fish than I have named.

263. I have given up practical fishing 10 or 12 years.

264. *By Chairman.*—I know the king-fish (*Thyrsites solandri*); they used to come in in large quantities.

265. I do not think they come in large numbers on this coast now. I do not think they have been on the coast for two or three years. It used to be thought that they followed the mackerel.

266. *By Mr. Webster.*—They used to be looked for in schools every year, but not since they have been taken with a hook and line.

267. *By Mr. J. Swan.*—It is 20 years since it was discovered that they would take a bait.

268. *By Mr. Johnston.*—The line used has a hook (without a barb) with chain and swivel, and is used in 12 fathoms of water, a fathom off the bottom; but later in the night and on dark nights they come closer to the surface. This is the only method of capture now employed.

269. *By Chairman.*—They and the barracouta appear in large schools.

270. *By Mr. Johnston.*—They appear regularly as to time of year.

271. *By Chairman.*—The king-fish are exported in large quantities when in the market; the price, 5s. per dozen.

272. *By Mr. J. Swan.*—The king-fish were last plentiful about four years ago.

273. *By Mr. Webster.*—They average from 12 to 14 lbs., and often reach 20 lbs. in weight.

274. *By Mr. J. Swan.*—When last plentiful there was a duty in Victoria on dried and smoked fish of 1d. a lb., and on salt fish, 4s. per cwt.

275. *By Mr. Johnston.*—I think the barracouta, from their voracity and swiftness, would be destructive to salmon.

276. I have opened large numbers of them and have only found small fry in them.

277. *By Chairman.*—King-fish are considered to be of very good quality.

278. *By Mr. Johnston.*—The height of the fishing season, April and May.

279. *By Mr. Allport.*—They are in the best condition, March to June. At that time I find spawn in them.

280. *By Mr. Johnston.*—I have never seen the young of king-fish.

281. *By Mr. Allport.*—I have seen them in shallow water, but that is long ago and in the spawning season.

282. *By Mr. J. Swan.*—Eagle Hawk Neck was a great place for them; they used to run ashore there in large quantities on moonlight nights, at the end of April, in the spawning season.

283. *By Mr. Johnston.*—They were supposed to go ashore whilst in pursuit of mackerel.

284. *By Mr. J. Swan.*—The places where they have come ashore have been where there was a narrow neck of land with the sea beyond.

285. *By Mr. Webster.*—At these necks the beaches are low and flat, and the water shallow.

286. *By Chairman.*—The horse-mackerel (*Trachurus trachurus*) used to be taken in larger numbers than they are now.

287. They are caught by hook, but principally by seine. They are a good marketable fish when brought in in small quantities.

288. They are not exported.

289. The young are seen in the bays in large numbers in the autumn.

290. *By Mr. Allport.*—They are an oily fish, and usually come in large shoals.

291. I have not known them tried for with other nets than seines. They have been caught in graballs.

292. *By Mr. Swan.*—They are not specially fished for, as in bodies they break the nets and are not of much marketable value.

293. *By Mr. Allport.*—With the proper appliances they would not be valuable enough to fish for. There would be no market for them.

294. They would be valuable if there was a market for them.

295. *By Mr. Johnston.*—I do not know where they deposit their spawn.

296. *By Chairman.*—I know the John Dorey (*Cyttus Australis*); it is not plentiful here. I have seen dozens this week,—that is more than I have seen for years.

297. *By Mr. Johnston.*—They are usually caught by net.

298. I do not know their season; they are now here.

299. I have seen odd specimens, but not in schools.

300. *By Chairman.*—I have seen silver fish (*Caranx georgianus*) caught in quantities, very small in size. I call these the trevally. The same fish grow to a large size. I have caught them from 10 to 12 lbs. in Twofold Bay.

301. I have never taken them in spawn, and do not know where they spawn.

302. *By Mr. Johnston.*—They are valuable food fish. I have known the small ones, 4 to 5 inches long, sold at 4s. to 5s. a bushel, on account of their abundance. The large fish would fetch 2s. 6d. each in the market.

303. The mature fish is better flavoured than the small one.

304. They are caught by graball and seine, but will take the hook.

305. They have been caught in large quantities at South Arm, the larger fish in deeper water.

306. The season is in the autumn, when the small fish are caught in numbers.

307. *By Chairman.*—I do not know the yellow-tail (*Seriola lalandii*) or the skip-jack (*Temnodon saltator*).

308. The fishing grounds for the common mullet (*Agonostoma Forsteri*) are Pipe-clay Lagoon, Prince of Wales Bay; in autumn and winter, Pipe-clay Lagoon and at Carlton.

309. They are always taken by the seine, and in large quantities.

310. They are a good marketable fish.

311. I do not know where they spawn.

312. *By Mr. Johnston.*—I have seen their roe; I do not know when it is mature.

313. *By Mr. Allport.*—The fish is rather a dry one.

314. *By Mr. Swan.*—Of late years there have not been large numbers of mullet brought to market.

315. *By Mr. Allport.*—There is not the demand for them that there used to be. It pays the fishermen better to fish for other fish.

316. *By Mr. Swan.*—I think there are plenty of them. They sell in the market at 3s. to 4s. a basket, containing a little over half a bushel, weight about 25 lbs. I have known them to be 10s. per bushel.

317. *By Chairman.*—I know the sand mullet (*Mugil cephalotus*?) I have known a few caught during the last twelve months,—taken at Southport in the seine. They are a good fish and bring a good price.

318. *By Mr. Johnston.*—There is a market for them if they could be had.

319. *By Chairman.*—The parrot fish (*Labrichthys*) is not a marketable fish here.

320. *By Mr. Johnston.*—I think the blue head is the best.

321. *By Mr. Allport.*—They are good food, but coarse.

322. *By Chairman.*—The stranger (*Odax Richardsonii*) is a good eating fish, and is generally caught at the mouths of rivers. It is a fish the shape of a pike.

323. *By Mr. Allport.*—They are not numerous. The largest I have seen was about 8 or 9 inches long.

324. *By Chairman.*—The rock cod (*Pseudophysis barbatus*) is a good marketable fish; there is the bank cod and the deep-water cod, which I think are different fish.

325. *By Mr. Johnston.*—They are caught all the year. There is a season for the deep-water cod—May to September. The difference between them is that the deep-water cod is lighter colored than the other.

326. *By Mr. Allport.*—They run up to 8 or 9 lbs. in weight.

327. *By Chairman.*—They are caught principally by hook.

328. There is a good demand for them; they sell from 6s. to 7s. a dozen, about  $\frac{1}{2}$ d. a lb.

329. *By Mr. Johnston.*—They are not cured or preserved in any way. They are a good fish for preserving, but there is a market for all that are brought in.

330. The young come up in May in large numbers.

331. *By Chairman.*—They are not exported, and I do not think they would be of value for export. I have exported a few, but there was no demand for them.

332. The ling (*Genypterus blacodes*) are sometimes brought to market, an odd one now and then. They are very good fish.

333. *By Mr. Allport.*—I have seen them from 10 to 15 lbs. in weight.
334. *By Mr. Swan.*—The ordinary size is 7 to 8 lbs. I have caught them as small as a lb. in seines.
335. *By Mr. Allport.*—They are principally caught by hook in 7 or 8 fathoms, on a rocky bottom.
336. I have not seen the young of them.
337. I have not known them in the other colonies.
338. Their value in the market is 4d. a lb.
339. I have not known them to be preserved, but have sent them to Victoria; they would not bring more than conger eels.
340. I know of no distinction as to fishing grounds for sole (*Annotretes rostratus*) and flounder (*Rhombsolea monopus*). I have caught soles only at a small beach below Brown's River.
341. The best fish of the two for the market is the flounder.
342. I have not known them caught off shore, nor do I know of any shallow banks where they have been or might be caught.
343. The supply of flounders has decreased owing to over-fishing.
344. I do not know their spawning season. The largest are caught in the summer.
345. They are fished for all the year round. They are a non-migratory fish.
346. The principal supply comes from the East Coast; that is, east of the River Derwent.
347. I cannot suggest any way by which these fish can be preserved, except by stopping the catching of small fish.
348. The present law is carried out as far as I know, but it has not had the effect of increasing the supply.
349. I have heard of fish being destroyed recently by dynamite, used by the crew of the *Dagmar*, on the East Coast. I heard that bushels of fish were destroyed at Bicheno.
350. *By Chairman.*—Flounders will carry in a well-boat.
351. They fish for them at Southport. I know of no ground below Recherche.
352. *By Mr. Allport.*—I have never heard of a turbot being caught in these waters.

MONDAY, 17TH APRIL, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, Curzon Allport, Esq., John Swan, Esq., R. M. Johnston, Esq., the Hon. C. H. Bromby.

MR. JOSEPH BARNETT'S *examination continued.*

353. *By Chairman.*—The season for gar-fish (*Hemirhamphus intermedius*) is April to October.
354. The method of capture—by seine, on the flats and beaches.
355. They are brought to market in quantities, but are not so numerous now as formerly.
356. There is a good market for all brought in; they bring from 4d. to 9d. a dozen.
357. *By Mr. Johnston.*—I only know of one kind.
358. *By Mr. Allport.*—They have decreased in size. This may be accounted for by the small meshed net used in their capture.
359. *By Mr. Johnston.*—I do not know where they spawn; we get very young ones in the seines late in the season about Long Bay.
360. The net usually employed has a mesh of about  $\frac{1}{4}$  inch from knot to knot.
361. *By Chairman.*—The anchovy (*Engraulis encrasicolus*) is never brought to market. The fishermen have no proper appliances for its capture.
362. They are sometimes seen in large quantities in Storm Bay.
363. *By Mr. Allport.*—They have not of late years come up the Derwent. I saw them many years ago in the bay near the Royal Society's Gardens.
364. They would be valuable if brought to market.
365. *By Chairman.*—I know the sprat (*Clupea sprattus*) and the pilchard (*Clupea sagax*). The latter is found more abundantly near Victoria.
366. *By Mr. Johnston.*—Fishermen see shoals of sprats about autumn in Storm Bay.
367. They have no means at present of capturing these fish.
368. *By Chairman.*—Conger-eels (*Conger vulgaris*) are often taken by hook and line.
369. They are a marketable fish. Their size varies from 7 lb. to 50 lb. They bring a very low price.
370. They are caught all the year round.
371. I think there is only one form of conger eel.
372. *By Mr. Johnston.*—I know of three kinds of leather-jacket (*Monocanthus*), but they have no distinctive common name here.

373. Some are good fish for the table, if skinned.
374. The big one with blue and yellow streak I think the best ; it has greenish fins.
375. These fish are not saleable in the market.
376. *By Mr. J. Swan.*—I have seen a lot caught on the same ground, some with blue heads and some whose heads were getting blue. I have never seen a small one with a blue head or a large one without a blue head.
377. *By Chairman.*—I know the skate (*Raja Lemprieri*). It is not brought to market in any quantity. It is not a marketable fish.
378. It is a good food fish, but it is not saleable here.
379. *By Mr. Johnston.*—The stingaree (*Urolophus cruciatus*) is not fit for food.
380. I know the sand eel (*Gonorrhynchus Greyi*). I have seen a few brought to market in winter.
381. I do not know where they were caught.
382. I do not know of any of the dog-fish or sharks which are used as food in Tasmania. The flesh of the dog-fish and smaller sharks is frequently used for bait.
383. *By Chairman.*—Oysters are not sold through the market, nor are they brought to the market.
384. *By Mr Johnston.*—The oysters are kept close to the market, but are not taken into it, because they are perishable if landed. They are stored in the water in bags.
385. *By Chairman.*—The market dues are paid.
386. *By Mr. Johnston.*—The rules of the market are carried out as far as practicable. In some particulars they require amendment, especially as regards the limits of the market.
387. *By Chairman.*—I am acquainted with the oyster regulations.
388. The first regulation as to unsaleable oysters wants alteration. The size fixed is too small,—2 inches in the smallest diameter would be a maiden oyster.
389. *By Mr. Johnston.*—The market is principally supplied from Spring Bay ; a few come from Cole Bay near Swanport.
390. They have been falling off in number every year. During last year under 30,000 were brought in ; these were principally from Spring Bay.
391. In former years they were brought from Southport, Port Esperance, Spring Bay, Cloudy Bay, Recherche, Carlton (a great quantity for two years).
392. We do not receive oysters from any of these places now, with the exception of Spring Bay. I cannot account for the failure. Enough oysters were left in the beds to reproduce the stock.
393. In the Narrows at Southport I have got oysters which have reached maturity in two years.
394. There are no saw mills at Spring Bay or Recherche, but in Southport and Port Esperance there are saw mills.
395. *By Mr. J. Swan.*—I think that sawdust close to the beds would be injurious, but not at Southport or Esperance, on account of the distance of the beds from the mills and the great body of water there.
396. *By Mr. Johnston.*—At Little and Great Swanport, Spring Bay, Carlton, Recherche, and Cloudy Bay there used to be plenty of oysters, but there are none now, and no saw-mills have been erected at these places.
397. *By Mr. J. Swan.*—I do not remember any regular oyster beds at Norfolk Bay.
398. Oysters have been got there of a large size during the last two years, but not in any quantity.
399. From Southport at its best time in one year there have been taken about 6912 bags. In three weeks another and myself have got 340 bags. Now none are brought to market, although sufficient were left to restock the beds.
400. The oysters used to cling to the rocks at high water mark at Southport. I have seen the rocks covered with them, and the next year I have seen the shells empty ; this was between low and high water mark.
401. I have seen the oysters on the rocks at the mouth of Prosser's River, but they were the same as those got on the beds in the bay.
402. The greatest quantity obtained in one year from Cloudy Bay was 4668 bags.
403. I have exported 500 bags of oysters to Victoria in one shipment—usually 500 in each bag.
404. When oysters were plentiful there were 6 or 7 boats at Southport employed in collecting them, and they were brought up to town periodically by crafts.
405. The Spring Bay beds at one time failed completely. I cannot account for it.
406. I do not think the dredging for the Victorian market did it any good. The Victorian fishermen took away the small and uneatable oysters for the purpose of establishing beds in Victoria.
407. The bed took 4 or 5 years to replenish.
408. In still water the oyster takes longer to come to maturity than where there is a current.
409. *By Mr. Allport.*—The oysters are found on the coast as far as George's Bay. I have heard of them in the Straits.
410. No steps that I know of have been taken to discover new beds ; there are no people who make it their business to do so.

411. *By Mr. Johnston.*—When I was fishing for oysters we always put back the young. Others that I knew of were equally careful. I have known fishermen to injure the oysters; because of their abundance at the time they took no care.

412. *By Mr. J. Swan.*—I never knew any quantity to be got in the Derwent.

413. I have known attempts made to establish fresh beds there, but without good result. I have not known any successful attempt in any other part of the Colony.

414. I think the Derwent a suitable river, but I don't think the oysters of this Colony will stand shifting.

415. *By Mr. Allport.*—I think that is the reason why the attempts so frequently made have failed hitherto.

416. *By Mr. J. Swan.*—I have known them to be shifted from one bed to another in Spring Bay, and they have died.

417. *By Mr. Johnston.*—In the new beds the oysters were scattered with a shovel, and not placed in heaps. In two years afterwards they were found dead.

418. The nature of the bottom was a sandy grit with only a few weeds, 2 fathoms of water, the ebb and flow about 4 feet, in the mouth of Spring Bay. The same conditions as in the old bed.

419. *By Mr. J. Swan.*—I have tried to increase an existing bed. I have taken from the banks at Southport the small oysters and thrown them into the channel, where there was a current, and 12 months afterwards I have taken them to market. These were moved about 200 yards.

420. *By Mr. Allport.*—If oysters were put into a strong current instead of into still water I cannot say whether they would succeed or not.

421. *By Chairman.*—The average depth of water on the oyster beds is from 1 to 3 fathoms. I do not know at what depth they are taken elsewhere.

422. We have dredged in 6 or 7 fathoms with our appliances, but we could not use them in deeper water.

423. The Melbourne smacks dredged off Spring Bay while under sail in about 20 fathoms, but they got no oysters there.

424. I have heard that oysters were at one time as scarce as they are now.

425. *By Mr. J. Swan.*—I have seen oysters and mussels at the same place, and have known the oysters to be destroyed by the mussels. This took place at Carlton.

426. *By Mr. Allport.*—I do not remember when the mussels were destroyed in one year in the Derwent. I remember that they died off completely at one time.

427. Mussels are now as plentiful as ever they were in the Derwent.

428. When the mussels disappeared it would appear that the oysters returned.

429. *By Chairman.*—At Spring Bay I have known grass to grow all over the beds, and still we got the oysters, but then they would be of poor quality; these when brought to town and taken to East Bay Neck would fatten and become fit for market.

430. *By Mr. J. Swan.*—Once the oysters are shifted they cease to breed, but I have found that they will live for a time and fatten.

TUESDAY, 25TH APRIL, 1882.

*Present*—A. G. Webster, Esq., (in the Chair), Curzon Allport, Esq., R. M. Johnston, Esq., A. Riddoch, Esq., M.H.A., the Hon. C. H. Bromby.

MR. JOSEPH BARNETT'S examination continued.

431. *By Chairman.*—When oyster fishing was at its best, about 15 to 20 years ago, the following is the estimated take of one year from the various places mentioned; viz.—Southport, 6912 bags; Cloudy Bay, 4668 bags; Port Esperance, 5780 bags; Spring Bay, 16,870 bags; Swanport, 10,470 bags. Total, 44,700 bags—500 oysters to each bag.

432. Crayfish (*Palinurus Edwardsii*) are caught nearly all round the island.

433. There is a season, but it varies. In the Derwent and D'Entrecasteaux Channel they stop running from end of September, and in other places not before December.

434. It would be well to make a close season from December to February, both months inclusive.

435. The crayfish brought in during these months are soft and not fit for food.

436. *By Mr. Johnston.*—Between Crayfish Point and Adventure Bay the crayfish cease to run much earlier than elsewhere—generally from September to December.

437. In localities extending southwards beyond these limits, they cease to run from December to February.

438. *By Chairman.*—Crayfish are brought in in great quantities with young attached from May to December.

439. The fish with young attached I would recommend should not be allowed to be caught or sold in the market. The female is easily distinguishable from the male by the last pair of legs on the body having double claws.

440. I have seen a second kind of crayfish, of a greenish color, and shell smoother on the tail than the other. They don't run very large in size.

441. *By Mr. Johnston.*—The average weight of a mature crayfish is from 6 to 7 lbs. We get them of that weight from the East Coast.

442. *By Chairman.*—The quantity of crayfish brought to market by the Tasmanian boats is about 200 a day for local consumption.

443. The average number exported is about 150 score a month, for about eight months in the year, to Victoria principally.

444. The value of the fish, wholesale, is about four shillings a dozen.

445. In addition to what I have stated already, I send about 30 dozen a week to Launceston.

446. I would suggest that no fish under 10 inches in length should be allowed to be brought to market.

447. The fish are captured by the ordinary hoop-and-bag net.

448. Fish-pots are now used for their capture on the East Coast by the Victorian boats.

449. I think these pots are very objectionable, because squids frequent places where they are put down, and kill the crayfish by the inky matter they eject.

450. *By Mr. Johnston.*—I have myself observed the fact that the inky substance kills the crayfish almost instantaneously.

451. *By Chairman.*—The pots also destroy a number of immature fish.

452. They are made with a flat bottom and rounded top, like a lobster pot. I do not know the size in use.

453. *By Mr. Allport.*—I think it is to be attributed to the use of these pots that King's Island and other parts of the coast are now denuded of crayfish.

454. I know of no record being kept of fish captured by Victorian vessels.

455. I believe no duty is paid on the fish in Victoria.

456. There is no means of ascertaining how many fish they take away.

457. The crayfish deteriorate in quality by being kept in the vessels, but not when conveyed quickly in crates by steamers.

458. The Warnambool fish are the same as ours. I know of no distinction between them.

459. I do not know of any fish here which is identical with the English lobster.

460. I saw some small crustaceans resembling the lobster taken from a barracouta.

461. I do not know any place where such crustaceans are actually caught.

462. I would suggest that no soft-shelled crayfish should be allowed to be brought to market; this would be better than a close season. I would recommend this in addition to preventing the sale of female fish with young attached; the capture of fish under 10 inches in length from head to tail when spread out; and preventing the use of the lobster pots.

463. The northern fish are larger than the southern, but I know of no other difference. By northern I mean north of D'Entrecasteaux Channel, not the northern coasts of the Colony.

464. There has been a great falling off in the supply. I have known a place called the Friars, where hundreds of scores a week have been caught, and now none are to be had; this is attributable to the causes already stated and to over fishing.

465. *By Mr. Johnston.*—I think there are plenty of young in these places if time were given them to reproduce the stock.

466. We have two kinds of crabs brought to market, called the king crab (*Pseudocarcinus gigas*), and common red crab (?).

467. They are caught in the same localities as crayfish.

468. The king crab attains a weight of from 15 to 20 lbs.; the small red crab under half a pound.

469. There is not much in the latter for food except the claws. The king crab is prized for food, but few are brought to market.

470. *By Mr. Allport.*—I have not heard of turtle in these waters.

471. There are no fish-curing establishments in the island, except those for smoking trumpeter and barracouta.

472. Mr. Peacock tried to start an industry in Hobart for preservation of trumpeter, barracouta, king-fish, mullet, salmon, and crayfish, by tinning. It was abandoned on account of some of them proving bad through defect in the process for curing.

473. I should think there is a profitable market for cured fish if the industry were started upon a proper basis.

474. There are no fishing depôts that I am aware of on the Tasmanian coast.

475. The quantities taken from the ordinary sources of supply of fish are now at times much greater than the demand, and consequently it would be advantageous for fish-curing establishments to be created.

476. During the last 20 years fish have very much increased in numbers in the upper waters of the Derwent. I attribute this to the river having been closed, especially against seine fishing.

477. Parties who go out in boats now get good line fishing.

478. *By Mr. Johnston.*—In the interests of permanent fisheries I think it would be of great advantage if a portion of estuaries were reserved as breeding-grounds.

479. *By Mr. Allport.*—I also think it would be well to have the power to temporarily close any fishing-grounds which have been overfished.

480. *By Chairman.*—If my recommendations are carried into effect I am of opinion that the existing machinery for the carrying out of the laws in respect of fisheries would be insufficient.

481. I see no objection to the imposition of a licence fee on fishing boats to raise a revenue for the purpose of providing the necessary machinery for the preservation of fisheries.

482. *By Mr. Johnston.*—I do not think a licence on nets would be preferable, because it would not be practicable. If it could be carried out I think it would be a very good thing.

483. *By Chairman.*—Fish hawkers in Hobart number from 45 to 50.

484. I hand in a statement showing fish booked by me as sold in the market for local consumption during 1881. (Appendix D.)

## TUESDAY, 2ND MAY, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, Curzon Allport, Esq., A. G. Webster, Esq., R. M. Johnston, Esq., E. D. Swan, Esq., C. T. Belstead, Esq.

### MR. ROBERT SMITH, *Fisherman, examined.*

485. *By Chairman.*—My name is Robert Smith; I am a fisherman.

486. I have been fishing out of this port for 18 years, having previously fished as a boy in France.

487. I fish now at Wedge Bay and about Cape Raoul with graball nets and hand line. I have fished on the East Coast as far as Maria Island, and on the West Coast as far as Port Davey.

488. The mesh of my nets is  $2\frac{1}{2}$  inches from knot to knot, the length about 27 fathoms, and depth about 9 feet.

489. I capture several kinds of fish—real trumpeter, bastard trumpeter, perch, rock-cod, &c., but I fish principally for bastard trumpeter.

490. I fish in water of from 1 to 15 fathoms.

491. I have caught real trumpeter from Port Davey, on the West, round to Maria Island, on the East Coast.

492. The school fish are to be got all the year round.

493. The large deep sea trumpeter are caught from January to April, inclusive, in water of a depth of from 25 to 70 fathoms.

494. I have caught the large fish full of spawn in deep water, and I have observed the milt running from them in May and June. I do not know where they spawn.

495. *By Mr. Johnston.*—I have seen very small trumpeter in deep water.

496. *By Mr. Belstead.*—The bottom is coral. We try the bottom with sinkers and grease before we fish.

497. *By Mr. Johnston.*—The large trumpeter are all taken with hook and line, the small fish with hook and line and in nets.

498. *By Mr. Belstead.*—I have never seen very large fish caught in shallow water.

499. *By Mr. Johnston.*—I have caught trumpeter of all sizes when fishing in deep water, but it is not usual to catch school fish in deep water.

500. I have never seen mature milt or roe in the school fish.

501. *By Chairman.*—The best fish for the table is the school fish, and they bring a better price in the market than the larger trumpeter.

502. *By Mr. Belstead.*—I do not think that fishing is as good now as formerly—neither with net or line.

503. *By Mr. Allport.*—This is owing to overfishing in certain places. Fish are getting scarcer every year; I have to go further afield now to get them.

504. There were places round the East Coast where trumpeter were formerly very abundant, and now we can scarcely get any fish. I have not gone there recently in consequence.

505. *By Mr. Johnston.*—Although personally I do not fish round the coast beyond the places I have stated during the last 5 years, I have good information as regards the state of fishing in different localities.

506. *By Chairman.*—The local requirements for real trumpeter are so limited, that if there are two or three boats in with the same sort of fish the market is overstocked, and we get little money for the fish.

507. It does not pay so well to fish now for the large trumpeter as for the school fish.

508. Several Victorian vessels fish round the coast.

509. The market price of a trumpeter for export is about 5s. each, for fish sometimes 30 to 40 lbs. in weight.

510. *By Mr. Johnston.*—The heaviest trumpeter I ever caught weighed about 60 lbs. I sold it for 9s. I have not heard of any heavier than that.

511. *By Mr. Allport.*—I have caught them about  $1\frac{1}{2}$  miles off Tasman Island, on reefs. As far as I have fished on these reefs fish have been caught,—the depth from 60 to 70 fathoms.

512. I have not fished for trumpeter outside the reefs.

513. I prospected for a new ground between Cape Raoul and Port Arthur, but without success.

514. I think there is trumpeter bottom all the way from Tasman's Island to the Hippolytes, with intervals of sand.

515. There are miles of ground not tried on the coast.

516. The weather and tide are the greatest difficulties to contend against when line fishing for large trumpeter.

517. There is an advantage in a light boat over a heavy boat, because the light boat will hold its ground without parting its cable; the heavy boat cannot hold on at such depths in the heavy tideway.

518. The current on the trumpeter ground is sometimes equal to 5 or 6 knots.

519. The sinkers are 10 lbs. in weight, with deep-water line generally of 80 fathoms; the line is white hemp,  $\frac{1}{2}$  inch circumference.

520. There are no tenders for carrying away the fish of the Hobart boats; each boat brings its own catch to market.

521. *By Chairman.*—I know the red bastard and white bastard. I do not think they are the same fish.

522. The red are caught all the year everywhere; the white do not come in until March, and go out in April.

523. *By Mr. Johnston.*—I have never seen mature roe or milt in the red bastard.

524. The large fish are fat in winter.

525. I have never seen mature roe or milt in the white bastard. I have never taken that notice of it.

526. I have seen a white mass of fat in them, but have not examined it particularly.

527. I have seen white fat in the large red bastard, but not in the smaller ones.

528. I have seen the fat red bastard all the year round.

529. I have never seen small white-bellied bastards.

530. *By Mr. Allport.*—The white-bellied is a deep water fish; they are always fat when they come in.

531. They appear on what we call white-bellied reefs every year; the reefs are more in the estuaries than real trumpeter reefs.

532. *By Mr. Johnston.*—The bottom is grassy or weedy, and deep water.

533. The red bastard are generally caught in shallower water.

534. The difference in depth does not affect the color of the red bastard.

535. I have seen small fry of the bastard; they were red, like the parent fish, and from 3 to 4 inches long.

536. The bottom, I think, affects the color and condition of the fish.

537. *By Mr. Allport.*—When I spoke of weed and grass, they mean the same thing.

538. *By Chairman.*—Both real trumpeter and bastards carry well in the boats.

539. They are not as plentiful as they used to be, owing to overfishing.

540. *By Mr. Allport.*—I do not know of any natural enemies to the small fry of the bastard trumpeter. I have never seen the young bastard taken from the inside of any other fish.

541. *By Mr. Johnston.*—I have never heard young fish termed paper-fish; I have never heard the term applied to young bastard trumpeter.

542. *By Chairman.*—The usual mode of capturing common silver perch is by hook and line.

543. They are caught in water at the edge of kelp—the bottom mixed sand and weed.

544. *By Mr. Johnston.*—I only know of two kinds of perch, the silver and the black.

545. I also know the magpie perch, but it is rarely caught; we get one occasionally in the nets.

546. *By Chairman.*—Perch are caught all the year round; they are very plentiful.

547. *By Mr. Belstead.*—I do not know where they spawn.

548. *By Chairman.*—They are not a very marketable fish—there is no great demand for them.

549. They will not live long in the wells; they prick each other with their fins and become disfigured thereby.

550. *By Mr. Allport.*—Perch is a fish which will cure or preserve well.

551. *By Mr. Johnston.*—Carp are got in the nets—they are seldom hooked. They sell well in the market.

552. They are a strong fish, and will live a long time in the well.

553. They are not, however, caught in great numbers.

554. I know the real bastard trumpeter (*Mendosoma*). They are not very plentiful.

555. They are caught in nets with the common bastard.

556. They fetch a better price in the market than the common bastard.

557. I have seen schools of them near Fortescue, but could not get them.



558. It may be possible that we have not the proper appliances for their capture.
559. *By Chairman.*—Bream are caught in seines. I have not caught any.
560. I have caught plenty of rock-cod.
561. I do not know their season,—they are caught all the year round. They are not taken in deep water.
562. *By Mr. Johnston.*—I only know of one kind.
563. *By Chairman.*—There is a good demand for them. They are caught principally with hook and line.
564. I used to catch king-fish about 5 years ago. They used to be so abundant that they were used for manure.
565. The season is from after Christmas to June.
566. Localities of capture—Recherche to Fortescue, and further up the coast.
567. *By Mr. Johnston.*—I have only seen one kind of king-fish.
568. *By Chairman.*—They used to come in in large numbers, but not during the last four or five years.
569. It was supposed that they came after the mackerel.
570. We generally fish for them with barracouta, but they will take mackerel bait best.
571. When they are on the coast they could be taken in enormous quantities.
572. *By Mr. Johnston.*—There is always roe in them all the time they are in. It is not usual to get a spent fish.
573. *By Chairman.*—There is a better demand for these fish than for any other fish brought to market.
574. They only appear on this coast at certain periods; I cannot account for this irregularity. During the last four years I cannot tell where they have gone to.
575. *By Mr. Johnston.*—There are no means of signalling the presence on the coast of schools of mackerel (*Scomber Australasicus*).
576. We see miles of them breaching on the surface of the water.
577. I refer to the horse mackerel (*Trachurus trachurus*).
578. *By Chairman.*—I do not think king-fish could be taken in drift nets; they would break any net.
579. *By Mr. Allport.*—The schools of mackerel could be caught in nets. There would be no difficulty in procuring the nets.
580. *By Chairman.*—I have caught as many as 50 dozen king-fish between sunset and 9 o'clock, and could have taken ten times as many if I had had room for them in the boat.

### WEDNESDAY, 10TH MAY, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, A. G. Webster, Esq., E. D. Swan, Esq., C. T. Belstead, Esq., R. M. Johnston, Esq., John Swan, Esq., R. C. Read, Esq., Curzon Allport, Esq.

#### MR. ROBERT SMITH'S examination continued.

581. *By Mr. Johnston.*—Among the market fish whose young are to be seen in the upper waters of the Derwent in large numbers I know of the rod cod and perch, although I have not fished for these to any large extent.
582. I do not know of the young of the bastard so coming up. I do not know much of the young which come up because I do not use the seine net.
583. I believe that seines destroy large numbers of young fish which in that state would not be useful for the market.
584. The destruction of the young perch and bastard would injure to some extent my kind of fishing.
585. If by poaching, or otherwise, young fish were destroyed to a great extent, this might partly account for particular market fish becoming scarcer every year.
586. It would not be much advantage to the market the gain of a haul of fish in the upper waters, when it is accompanied to a large extent by the destruction of young fry.
587. The kinds of surface fish which run in large shoals, and do but barely enter the Derwent, are the sprat, horse mackerel, the native salmon, barracouta, big snotgall, mackerel trevally, mullet.
588. I have not seen any of the herring family other than the pilchard and sprat.
589. I know the Bastard John Dorey. They go in the graballs. I got 5 or 6 last trip. They are scarce.
590. We have not the proper means here to capture such fish,—I mean the smaller fish.
591. *By Mr. J. Swan.*—I have only caught a few dozen Bastard John Dorey in the course of my fishing.

592. *By Mr. Johnston.*—I do not know whether we have the proper means here of capturing the John Dorey.

593. I have seen more John Dorey than I have caught.

594. *By Mr. J. Swan.*—From my experience of the number of the John Dorey, and their value in the market, I do not think them of much commercial consequence.

595. *By Mr. Johnston.*—I do not know anything of their quality.

596. *By Mr. Belstead.*—I did not fish much at home in France; I was only a boy then.

597. I do not know how they fish for the John Dorey at home.

598. *By Mr. J. Swan.*—The snotgall are often seen on the surface, but are caught on the bottom.

599. I have occasionally caught barracouta when fishing for trumpeter, and frequently when fishing for king-fish.

600. *By Chairman.*—The small fish could be got in quantities if there were the proper appliances for their capture.

601. I am in the habit of taking crayfish.

602. There is no season for them; hard fish are caught all the year.

603. The crayfish cast their shell every year, but at different times in different places.

604. They are usually taken by hoop-net; no lobster pots are used here.

605. *By Mr. Belstead.*—We get crayfish in spawn all the year according to locality.

606. I think the crayfish should be protected by stopping the capture of the female fish.

607. *By Mr. E. D. Swan.*—We generally get more male than female fish.

608. *By Mr. Belstead.*—I catch crabs when crayfishing, a dozen or two now and then.

609. *By Chairman.*—Crayfish are brought to market of various weights.

610. *By Mr. Belstead.*—We sell them by the score, which are sometimes 40, according to size, two or more small being counted as one.

611. *By Chairman.*—I don't get them so plentifully as formerly owing to overfishing.

612. I think it would be quite right to prevent the capture of small crayfish; I think the size mentioned by Mr. Barnett—10 inches—small enough.

613. It is not usual to bring the soft fish to town.

614. I don't think it would be of any use to close portions of the coast at different times.

615. *By Mr. Belstead.*—We always get them as close home as possible.

616. *By Mr. J. Swan.*—We get crayfish anywhere, but not so plentifully now as formerly.

617. *By Chairman.*—I think that lobster pots are injurious to crayfish, because all are taken, large and small.

618. I don't think that squids would do crayfish any injury.

619. *By Mr. Belstead.*—Crayfish are sent to Melbourne in winter: that is the market we look to to get rid of our crayfish. A good load here swamps the market.

620. *By Mr. Allport.*—Soft-shelled fish ought not to be allowed to be brought to market.

621. *By Chairman.*—I have seen the pike, but have not caught any. They are not a regular market fish.

622. I catch flatheads,—they sell very well in the market. They are caught all the year.

623. I do not know when they spawn.

624. I know the rock-gurnet; they are generally caught in deep water.

625. They are plentiful in places on the East Coast,—generally on trumpeter ground.

626. They are good marketable fish, and sell well.

627. I have never seen the whiting.

628. I have never seen the yellow-tail.

629. I catch ling occasionally, mostly in shallow water.

630. It is a valuable market fish here; a good sized ling will fetch 5s.

631. *By Mr. Allport.*—They are generally caught in the kelp.

632. *By Chairman.*—I catch eels; they generally go to Melbourne market at this time of the year.

633. *By Mr. Johnston.*—I only know one kind of conger eel,—some are slate-coloured, others black.

634. *By Chairman.*—When fishing we are much troubled by sharks; the sharp-toothed sharks are the worst.

635. They are very plentiful in autumn.

636. *By Mr. J. Swan.*—There were five boats out last week shark-catching in Storm Bay and about the mouth of the Derwent. They save the fins, take out the liver for the oil, and sell the carcasses for manure.

637. It is a profitable occupation,—pays very well.

638. The fins go to Melbourne.

639. The sharks go about in large schools.

640. *By Mr. Read.*—I have never caught fresh water eels in salt water. I saw one caught in the fishermen's dock here recently.

641. *By Chairman.*—I have caught half a dozen English salmon in one winter, at Wedge Bay, from 15 to 23 inches in length.

642. *By Mr. Allport.*—They were taken in the graball.

643. The large fish was in good condition.

644. *By Mr. J. Swan.*—The fish were meshed, not rolled up in the net.

645. *By Chairman.*—I saw one jumping in Wedge Bay about six weeks ago much larger than any of those I caught. I should say it was at least 7 lbs.

646. I have never seen one in a barracouta.

647. I saw English salmon in England 4 years ago, and I think those I caught were, from their appearance and color, the same as those I saw in England, although they were of smaller size.

648. *By Mr. Allport.*—It was about winter time, a little later than this, that I caught them,—not in the summer.

649. *By Chairman.*—I should like fishermen to be bound down to use certain meshed nets  $2\frac{1}{4}$  inches from knot to knot.

650. I think there ought to be a licence paid, and that there should be some rules to go by.

651. Supposing a law was passed to protect fish, a man would have to be appointed to see it carried out.

652. Plenty of fish are now sold after the usual market time in the morning.

653. *By Mr. Allport.*—I would license the men, not the boats. I would not object to the boats being licensed.

654. I have never tried fishing with trawl nets or drift nets.

#### FRIDAY, 12TH MAY, 1882.

*Present*—Matthew Seal, Esq., (*Chairman*), R. M. Johnston, Esq., A. Riddoch, Esq., C. T. Belstead, Esq., Curzon Allport, Esq., John Swan, Esq., A. G. Webster, Esq., E. D. Swan, Esq.

#### MR. THOMAS HADLEY, *Fisherman, examined.*

655. *By Chairman.*—My name is Thomas Hadley; I am a fisherman, and have been fishing out of Hobart for 30 years.

656. I was fishing in England before coming to Tasmania—fresh-water fishing in the Thames.

657. I generally fish here as low as Southport and Recherche.

658. *By Mr. Belstead.*—I have fished further afield.

659. *By Chairman.*—I now fish principally for crayfish.

660. I use the ordinary hoop net, not lobster pots.

661. I do not know anything of the use of lobster pots.

662. Crayfish are in their best condition in the winter months.

663. Female fish shed their spawn at the latter end of winter. At this time of year the spawn are just forming.

664. Crayfish cast their shells at different times in different places.

665. They cast their shells in the summer months.

666. *By Mr. Johnston.*—We get the latest hard-shelled fish at Black Jack, the Channel, and the Actæons.

667. I have not observed any difference in time of casting shell between the old and young crayfish.

668. *By Chairman.*—The females cast their shells first, usually about this time.

669. I sometimes bring a few soft-shelled fish to market.

670. *By Mr. J. Swan.*—I think both male and female shed their shells every year.

671. When the barnacle is on the fish it is a sign that it is in condition and fit to eat.

672. We judge by the barnacle that the fish is in good order.

673. It takes a month or two before the shell is barnacled.

674. In some places the shells are not barnacled at all, but when the shells are hard the fish are in good order; the bottom in such places is weedy.

675. I think when a fish has a hard shell it is always in good order.

676. I have not noticed that the fish are out of condition immediately after spawning.

677. Some fishermen cannot tell the male from the female except by the spawn.

678. *By Mr. Johnston.*—I know the female fish by the double toe on the claw nearest the tail.

679. *By Chairman.*—I could not say what quantity I take in a year.

680. *By Mr. Belstead.*—I do not crayfish all the year.

681. They are not very regular, but they begin to run about this time of year.
682. Crayfish are getting scarcer every year.
683. *By Chairman.*—This is owing to overfishing; they are worked out, like the trumpeter, in many places.
684. I know of no remedy for this.
685. It is the custom of fishermen to bring only marketable fish up; they throw overboard the smaller fish.
686. I do not think that a fish under 10 inches long should be brought to market.
687. The price of crayfish for Melbourne market is 5s. per score.
688. *By Mr. Webster.*—If the fish are small two are counted for one.
689. *By Mr. J. Swan.*—The smallest sized crayfish I have seen could be put in a match box, about 1½ inches long. I have only seen one or two, which were caught by myself. I caught them in Bull Bay, on the crayfish ground; they were soft-shelled.
690. The smallest size that will run and get into the nets are from 3 to 4 inches long, doubled up; they are hard-shelled.
691. *By Mr. Johnston.*—I do not know how large the young are just before being detached from the mother.
692. *By Chairman.*—My take of fish varies from 8 to 12 score a trip.
693. A trip sometimes takes 8 days.
694. *By Mr. Johnston.*—I do not know how many men fish for crayfish in the season.
695. *By Chairman.*—I have never caught large crabs. I have seen them caught at Tasman's Island.
696. I did at one time fish for trumpeter at Tasman's, the Pillar, Hippolites, and about there, principally on the East Coast.
697. I do not know the depth, but it might be 50 or 60 fathoms.
698. School-fish in shallow water, more in shore; not caught in deep water.
699. *By Mr. Johnston.*—We get one like school-fish,—half grown trumpeter,—in deep water.
700. *By Chairman.*—The distance from shore is 1 mile and upwards on reef ground, with bold water all round.
701. When out crayfishing, I have caught bastard trumpeter, rock cod, flathead, small trumpeter.
702. *By Mr. Webster.*—I only fish by myself, and do not go far away.
703. *By Mr. J. Swan.*—I graball about the Derwent.
704. *By Chairman.*—I have seen trumpeter with roe in them in the winter. I do not know where they spawn.
705. *By Mr. J. Swan.*—I have only caught one English salmon, down against the Passage.
706. I have not seen many.
707. The weight of the one I caught was about 4 lbs.
708. *By Mr. Johnston.*—I have fished for perch.
709. The one produced is the sand perch.
710. The perch is black on rocky ground and silvery on sandy ground.
711. The specimen produced I would say was caught on sandy ground.
712. They are caught in the nets sometimes when fishing for bastards.
713. *By Mr. Webster.*—We catch them with the hook.
714. *By Mr. J. Swan.*—Most which come to market are caught with the hook.
715. I believe the color depends on the bottom.
716. Rock cod differ according to the bottom,—they are light coloured on the sand, and dark on the rocky bottom.
717. We cannot catch as many off Tasman Island as we did, nor as big.
718. There are not so many perch, nor are they so large now brought to market.
719. Adventure Bay, which used to be a splendid perch ground, is now worked out.
720. *By Mr. Johnston.*—The black perch is the best fish for the market.
721. *By Chairman.*—I catch red carp in the graball.
722. I have never caught one with the hook.
723. My graball is 22 fathoms long, 6 feet deep; mesh, 2 inches from knot to knot.
724. I catch bastard trumpeter.
725. The white fish come in in summer. I do not get many, because I only fish in the river.
726. I don't think it would be a good thing to license fishermen.
727. I cannot offer any suggestions.
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WEDNESDAY, 17TH MAY, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, R. M. Johnston, Esq., E. D. Swan, Esq., A. G. Webster, Esq., Curzon Allport, Esq., C. T. Belstead, Esq.

MR. WILLIAM IKIN, *examined*.

728. *By Chairman*.—My name is William Ikin; I am an owner of fishing boats, and have been connected with fishing since my youth.

729. I have been in the habit of both seine and graball fishing in the River Derwent, but not during the last 12 years.

730. The seines were from 40 to 45 fathoms long, 12 feet in the bunt, 7 feet in the wings; mesh, 1 inch from knot to knot;  $\frac{3}{4}$  inch mesh in the bunt for about 10 fathoms; straight net, no purse.

731. For garfish the seine in the bunt would be about  $\frac{1}{2}$  inch for about 10 fathoms.

732. In using the garfish net other kinds of fish would be taken.

733. In Victoria the legal mesh in the wings is 1 inch from knot to knot, in the shoulders,  $\frac{3}{4}$  inch, in the bunt,  $\frac{1}{2}$  inch.

734. In former days a trawl net was used here, but without success.

735. The graball used by me was 15 to 20 fathoms long, 6 feet deep, 2 inch mesh from knot to knot.

736. *By Mr. Webster*.—I know of no other net in use here except the seine and graball.

737. The fish which I have caught in largest numbers were mullet, native salmon, flounders, and garfish.

738. Between 30 and 40 years ago flounders were very scarce indeed; they then appeared in great numbers and were sold as low as 9d. a dozen.

739. I have known 50 dozen taken at a haul at Brown's River beach.

740. I think the king-fish used to destroy a great number of young flounders. I have got as many as 8 or 9 from the inside of a king-fish.

741. *By Mr. Johnston*.—I have no experience outside the Derwent.

742. *By Chairman*.—The king-fish were very plentiful when flounders became scarce.

743. Cart loads of king-fish used to be got up the river on the beaches years ago.

744. When the king-fish disappeared the flounders appeared in great numbers.

745. *By Mr. Johnston*.—The king-fish appeared to be associated with the mackerel, because when the one fish disappeared the other also disappeared.

746. I know the young and old of the common fish in the Derwent.

747. Among the young fry which come into the Derwent are the mullet and native salmon, anchovy or pretty fish, mackerel, and sprat.

748. I never saw but two native salmon with roe in them; they were taken at Brown's River beach, and were fish of about 9 lbs. each.

749. I know the paper-fish; they are something like the bastard trumpeter, only they are thin and silvery.

750. They used to come up in great numbers in former years.

751. Most of them were taken in the seine in Ralph's Bay.

752. I think the barracouta one of the chief enemies of the sprat; the porpoise and the native salmon are also very destructive to the young fry; also the gannet, cormorant, and penguin.

\*753. I know of some men who have carelessly drawn seines on shore and destroyed young fish in large quantities, but I have always emptied my seines in the water; this is the proper method.

754. I would object to the seines being drawn on the shore.

755. I have never seen ova except in the fish.

756. I suppose that all our estuary fish spawn higher up than where fishing is carried on.

757. The bream ascends the river and spawns in the brackish water creeks.

758. I suppose that mullet and native salmon go up the river to spawn.

759. *By Mr. Webster*.—In regard to native salmon, I heard years ago of a lot being caught full of spawn in Adventure Bay.

760. *By Mr. Johnston*.—The small fry are found up the river in greatest abundance.

761. The flounders I think spawn in the bays. We do not get the large flounders up the river.

762. I do not think the perch spawn up the river.

763. The white-bellied trumpeter do not come up the river at all.

764. I have never observed the red bastard with milt or roe.

765. I think neither the red or white bastard spawn in the upper reaches of the river, although the young are seen there.

766. A year ago rock-cod were plentiful; this year they are not so abundant.

767. I did not notice whether they were full of roe.

768. I do not know where they spawn.

\* The witness afterwards desired to amend this statement as follows:—"Large quantities" to read "small quantities;" the remainder of Answer 753 to be struck out.

769. The rock-cod which came up in great abundance last year were principally mature fish.
770. The large fish and small fish are generally found in separate shoals.
771. I have caught at one time 13 or 14 native salmon which must have weighed 13 or 14 lbs. each, but this was a rare occurrence; I got them in a seine in deep water.
772. In the spring of the year when native salmon were caught they were generally wounded. These were solitary fish.
773. I attribute their isolation from the school to their being wounded.
774. I have never noticed any special disease in the fish here at any time.
775. *By Chairman.*—I don't think the mullet are as plentiful now as formerly.
776. *By Mr. Webster.*—There are only 3 or 4 seine boats out now; there used to be 8 or 9.
777. *By Mr. Belstead.*—I have no idea why the fish have become scarce.
778. The scarcity of native salmon I attribute to graballs.
779. I consider a standing net does more harm than one drawn.
780. *By Mr. Johnston.*—I think a fixed net at the mouth of a river would do a great deal of harm, in preventing the ascent of spawning fish and otherwise doing injury to them.
781. *By Chairman.*—I think the red bastard and white bastard are the same fish. I notice more white fish about the end of summer.
782. Our native fish principally spawn in summer.
783. *By Mr. Johnston.*—I have never seen the roe in the white bastard; I have not opened many of them.
784. The silver-fish, or trevally, I have seen in the Derwent in great abundance about 14 or 15 years ago; in South Arm, especially, they were so abundant that the nets could not be hauled.
785. The mackerel-trevally used to come up in the same way.
786. *By Chairman.*—I think the law as to flounders has been carried out.
787. I think it has had a good effect in preventing the small fish being brought to market.
788. *By Mr. Johnston.*—I have heard of the black bream being caught in the mouth of North West Bay River. The only bream which ascends the Derwent is the silver bream, which goes up as high as the Falls at New Norfolk.
789. *By Mr. Belstead.*—I have not caught many of the English salmon. I have heard of more being taken down the river than elsewhere.
790. *By Chairman.*—I have not had any experience in taking shrimps in the Derwent.
791. If proper appliances were used I believe the anchovy could be taken in numbers. I have seen them in great numbers in Barnes' Bay, generally in the summer. I have also seen them in the Derwent at Limekiln Bay and other places.
792. I have been in the habit of catching crayfish by the ordinary hoop net.
793. I never used a lobster pot; I do not know anything of them.
794. The crayfish net has no fixed mesh.
795. I think that no crayfish under 10 inches should be brought to market.
796. The female is usually smaller than the male.
797. In some places all taken would be females. I think that no female with spawn should be brought to market.
798. When crayfishing the soft fish come into the nets.
799. I don't think that any crustacean or shell fish is wholesome food in the height of summer, whether crayfish, oyster, or mussel.
800. *By Mr. Webster.*—I think that no crayfish should be brought to market in December and January, and that for the better preservation of the fish themselves, this should be a close season.
801. *By Chairman.*—Crayfish cast their shells earlier down the river than they do up the river.
802. We used not to ship crayfish to Melbourne after November on account of their shells being soft and they would not live.
803. I think there is a great decrease in the number of crayfish owing to overfishing and taking the small fish.
804. I have known 4 or 5 score small ones sold for 1s. 6d. or 1s.
805. In summer time I believe our small fry are all up the river beyond Bridgewater, and that the boundary for closing the river should be altered according to the season.
806. I think licensing fishermen would be a good thing.
807. *By Mr. Webster.*—If regulations were made to govern fisheries, some one would have to be appointed to see that they were carried out.
808. I would, in the interest of the fisheries, suggest the following limits for closing the Derwent:—As low as Austin's Ferry, during December, January, and February; Risdon, during March, April, May, September, October, and November; Battery Point, June, July, and August.
809. *By Chairman.*—With regard to closing the river for long periods in respect of oysters, I am of opinion that it is a mistake, as, if not disturbed at intervals by dredging or other artificial means, the shell fish are choked by mud and sediment.
810. The close season for oysters should only be for an interval each season.

MONDAY, 22ND MAY, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, E. D. Swan, Esq., C. T. Belstead, Esq., A. G. Webster, Esq., Curzon Allport, Esq., R. M. Johnston, Esq.

MR. FRANCIS RUSH, *Fisherman, examined.*

811. *By Chairman*—My name is Francis Rush; I am a fisherman, and have been fishing out of Hobart 16 or 17 years.

812. I fish from Port Davey on the West to Seymour on the East Coast.

813. I usually fish with line and graball.

814. My graball is  $2\frac{1}{4}$  to  $2\frac{1}{2}$  inches gauge from knot to knot, length 20 to 25 fathoms, depth about 9 feet.

815. I have never heard of trawl nets or drift nets being used here.

816. In the summer I use the nets principally because the fish are then more in shore.

817. I suppose the fish come in shore to spawn.

818. I fish with graball at from 1 to 6 fathoms, but occasionally set them in deeper water.

819. With hand-line I fish in water of from 15 to 43 fathoms.

820. I always fish with hand-line on coral reefs; the water round the reefs is much deeper than on them.

821. The farthest distance from shore where I have fished on a reef was 5 or 6 miles off Seymour.

822. I believe that the reefs are more plentiful if they were looked for. The live coral reefs are the best for fishing.

823. On the reefs I catch the large trumpeter and perch.

824. The bait used is shark or crayfish.

825. The coral reef trumpeter swim in large schools.

826. The trumpeter spawn in June, July, and August; the spawn are shed in July.

827. They spawn in deep water on the reefs.

828. *By Mr. Webster*.—In former years large trumpeter were caught in shallow water on the inner reefs inside the kelp, but not now on account of overfishing.

829. *By Chairman*.—I think that trumpeter under 8 inches long should not be caught or brought to market.

830. *By Mr. Johnston*.—When they are not big trumpeter we call them school fish. I have never seen mature ova in fish under 15 lbs.

831. *By Mr. Webster*.—As a rule, trumpeter fishing is not so profitable as other fishing.

832. *By Chairman*.—Perch are not so plentiful as formerly; they are like every other fish, getting scarce.

833. *By Mr. Allport*.—I think the decrease is owing to young fish being taken.

834. *By Mr. Johnston*.—I know the silver perch and the black perch; the latter are caught on the reefs.

835. I know the difference chiefly from color and condition.

836. There is no difference in the development of roe in the black and white perch.

837. The only young perch that I know is the one that comes in the shallows in shoals.

838. *By Chairman*.—Perch do not carry in the well-boats; they prick each other.

839. I see the roe in deep-water perch from about April to August.

840. I think the very small perch taken in the nets should not be brought to market.

841. Perch are in best condition when in full roe, from May to August.

842. I catch carp in the graballs. There is no particular season for them.

843. *By Mr. E. D. Swan*.—They are a scarce fish.

844. *By Mr. Johnston*.—They are odd fish, taken with bastard trumpeter.

845. *By Chairman*.—They are a good fish, but are not thought so here; I think them equal to trumpeter.

846. *By Mr. Johnston*.—I have caught carp as small as 4 inches.

847. I have no idea where they spawn, except it is in shore amongst the kelp.

848. *By Chairman*.—Bastard trumpeter are taken in the graballs.

849. The white fish come in from February to latter part of March.

850. I believe the white and red bastards are different fish.

851. *By Mr. Johnston*.—The white have a much finer scale than the red.

852. They are caught in bottom from 5 to 6 fathoms.

853. When in the young stage it is difficult to pick out a silver from a red.

854. (Specimen of ovaries produced.) I have opened the fat of a silver bastard. I think I have seen something like this in them—small, but never large. I fancy I have seen the same in the large brown bastards, but have seen more in the silver.

855. The height of season for white fish is February, but you get them in January, February, and March.

856. I think they go on to deep-water reefs after this. I have hooked them there, odd ones occasionally, just as in shallow water. I caught one in about 25 fathoms off Bruni lighthouse, on a trumpeter reef, about August.

857. I think the silver bastards come into shallow water to spawn (5 to 6 fathoms).

858. I have seen fish called paper-fish, very like young bastards.

859. There are more fish destroyed by seines than by other modes of netting.

860. It is very rare to catch a silver bastard trumpeter inside the Iron Pot lighthouse.

861. If a seine net is drawn the fish must be landed to be taken.

862. I never saw a seine emptied from the water. I don't think it practicable to do so. It can only be done by means of a pocket net.

863. I don't think so many young fish are destroyed now as formerly.

864. The boats are now larger and go further afield, and the mesh of nets is also larger; practically, seining is not carried on to such an extent as formerly.

865. The pocket nets are more expensive and difficult to work.

866. If it be shown that the seines are destroying the fisheries, it would be well to think of some way of preventing it. You cannot help destroying some.

867. I think it advisable that the young fish should be thrown back.

868. The destruction of young fish is the cause of scarcity of all fish.

869. If some means were devised, such as improvement of nets, which would secure the marketable fish without destroying largely the young fry, the fishermen would be glad to adopt them in their own interests.

870. I would fix the mesh of nets so that the small fish would escape.

871. *By Chairman.*—I would fix a flounder net at 2 inches from knot to knot. The garfish net causes the destruction, and cannot well be altered.

872. *By Mr. E. D. Swan.*—The decrease in fish has been gradual for years.

873. Seine fishing has also decreased, because the fish are not to be had.

874. *By Chairman.*—I know the real bastard; they are scarce here, and are not thought much of in the market.

875. They are taken in the graball.

876. *By Mr. Johnston.*—They bring about 3s. a dozen in the market.

877. At times I get them in the net in numbers on the East Coast about Wineglass Bay.

878. They won't live in the well for any length of time.

879. I have eaten them myself.

880. The depth of water is from 1 to 6 fathoms.

881. They are generally taken in April and May full of roe.

882. Their habits are somewhat similar to the silver-bellied trumpeter.

883. The roe is larger than the specimen shown (*Latris Fosteri*).

884. I have never seen their young.

885. They are most abundant at places not readily accessible for ordinary fishing.

886. *By Chairman.*—I have fished in Port Arthur; fish are becoming scarce there.

887. About 15 years ago fish were very plentiful there.

888. *By Mr. Belstead.*—That was before it was opened to fishermen.

889. Fish were much more plentiful when it was first opened than they are now.

890. *By Mr. E. D. Swan.*—I have seen a few pike, but not many.

891. *By Chairman.*—I bring flathead to market. They are caught everywhere on sand. The seine nets take the most; they are also taken with the line.

892. I do not know when they spawn.

893. They are not considered a good market fish except when other fish are scarce.

894. *By Mr. Johnston.*—I think they feed on small crabs.

895. *By Chairman.*—The rock gurnet is very plentiful; taken on the trumpeter ground.

896. They are not a good marketable fish.

897. The principal fishing grounds for king-fish are Recherche, Wedge Island, and Adventure Bay.

898. They are taken by hook and line.

899. I have taken them from the surface to 10 fathoms.

900. *By Mr. Belstead.*—I never fish on the bottom for them.

901. *By Chairman.*—They come in large bodies, and follow the horse-mackerel.

902. I have caught 40 dozen in a night, 12 to 14 lbs. each, with two men.

903. My boat is a well-boat, length 37 feet 6 inches, beam 7 feet 8 inches, depth about 3 feet; two men.



904. For king-fish the bait is mackerel or barracouta.  
 905. If there was a market it would pay well to make a specialty of king-fish catching.  
 906. The thickest of the season is May and June.  
 907. When they are plentiful it would pay to look out for them if 5s. a dozen could be got for them.  
 908. *By Mr. Belstead.*—A few came in this morning.  
 909. I have seen the horse-mackerel about lately.  
 910. *By Chairman.*—I get spawn in king-fish; they spawn in shore, I think.  
 911. The king-fish do not come in every year.  
 912. *By Mr. Webster.*—I think that as the boats are always on the look out for them they could not be on the coast without their presence being known.  
 913. *By Mr. Johnston.*—The mackerel come in more or less the same time every year, but king-fish are most abundant when the horse-mackerel are most abundant.  
 914. *By Chairman.*—It is seven years since king-fish were plentiful; they were then sold at 3s. a dozen.  
 915. The price varies according to the quantities brought in.  
 916. Four dozen brought in this morning sold for 18s. 6d. per dozen in the market.  
 917. When they come into the shallow water and get sick I think they have spawned.  
 918. The season for barracouta is from January to June.  
 919. They are taken by jig, and can be taken in any quantity.  
 920. They are taken in any of the bays from below Iron Pot to Adventure Bay for this market, but they are plentiful all round the coast.  
 921. We suppose they come after the sprat, I think anchovies also.  
 922. *By Mr. Webster.*—I don't think there is a market for any quantity. The price varies according to supply. At times there are so many that no price can be got for them.  
 923. *By Chairman.*—3s. a dozen would pay well.  
 924. They could be taken in large quantities if required.  
 925. 24 dozen barracouta weigh about a ton.  
 926. I have seen ova in them. I think they come into the bays to spawn.  
 927. They are sent away to Victoria in large numbers.

### WEDNESDAY, 31st MAY, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, R. M. Johnston, Esq., John Swan, Esq., A. G. Webster, Esq., R. C. Read, Esq., E. D. Swan, Esq., Curzon Allport, Esq.

MR. ANDREW CHARLES KIRK, *examined*.

928. *By Chairman.*—My name is Andrew Charles Kirk; I am a resident of Hobart, and have been rod-fishing for 26 years.  
 929. *By Mr. J. Swan.*—I remember before the River Derwent was closed to protect salmon, that rod-fishing was not nearly so good as it is now.  
 930. I attribute that to the operations of the seine fishermen.  
 931. Between Austin's Ferry and the Harbour rod-fishing was then scarcely worth following, the number of fish obtainable being so small and the size and quality so inferior.  
 932. The mullet taken 20 years ago were never allowed to grow to maturity— $\frac{1}{4}$  to  $\frac{1}{2}$  lb. Now it is no uncommon thing to get 4 to 6 dozen mullet averaging  $\frac{3}{4}$  lb.,—individual fish occasionally reach 1 $\frac{3}{4}$  lbs.  
 933. I attribute the increase of fish to the absence of that constant and indiscriminate netting in the river which had taken place in previous years.  
 934. I think the fishing has steadily improved, but more rapidly during the last 4 years.  
 935. With this improvement the number of anglers has largely increased.  
 936. Before this time on a general holiday you would not see a dozen men rod-fishing, now you can see from 100 to 150 or more.  
 937. Last Easter Monday at Austin's Ferry it was so crowded that many had to go to another point; there were from 40 to 50 rods. There were also a number at Triffitt's, Berriedale, Elwick, Risdon, New Town Bay, and other places. I saw between 60 and 70, and those would only be a portion of the men fishing.  
 938. When the schools of mullet, mackerel, or snotgall come in, large numbers of rods are brought into use. On one occasion lately I counted at the wharf, in one place, 137 rods. On that occasion myself and another got 29 dozen fish.  
 939. The fish taken by the rod anglers are perch, mullet, native salmon, bastard trumpeter, snotgall (two kinds), flathead, rock-cod; mackerel (horse and English) are also caught, as well as flounders and garfish, and occasionally real trumpeter and barracouta.

940. English salmon or trout I have seen taken by ground bait; I have seen several so taken at the Berriedale by men fishing for mullet; I knew one caught to weigh  $8\frac{1}{2}$  lbs.

941. I caught two real trumpeter with rod and line at the mouth of the Dock in November one year, and I knew of 7 or 8 others who caught some within a fortnight of my catch; they were school-fish.

942. The residents of this city who practise fishing as a pastime now number hundreds. They are mostly tradesmen and working men; with them the fish are important and are a welcome addition to their household fare. Their value is a set off against expense of tackle.

943. Besides these there are also a large number of gentlemen (clerks and others) who are constant fishermen.

944. Six men went to the flat-rock at Risdon one day and, with rod and line, caught 18 dozen mullet, besides about 36 dozen other fish. This was two years ago, in March.

945. I think it would be a serious interference with the profitable amusement of a great number if the upper waters of the Derwent were thrown open to the destructive seine nets. I am sure that my opinion on this point is shared by all my fishing acquaintance.

946. *By Chairman.*—I sometimes see the river full of small fry going up, usually about November.

947. *By Mr. Allport.*—They come down again about April.

948. *By Chairman.*—I think the upper waters act as a nursery.

949. *By Mr. Johnston.*—I have seen and caught young bastard trumpeter in large numbers. The upper waters are the nursery ground for such fish.

950. I have also seen the young perch in large numbers in the Derwent.

951. Taking these as types of the sea fish, I think that closing these upper waters is an advantage to deep sea fishing.

952. The seine nets if used in these waters would, in my opinion, injure deep sea fishing.

953. I have seen on Cox's Beach 26 years ago a cartload of young fish lying putrid, left there by the seine fishermen. I consider this a proof of the immense numbers of the fry of these deep sea fish which ascend the upper waters of the Derwent.

954. So far as the upper waters of the Derwent are concerned, I think this ruthless destruction is prevented by the river being closed.

955. Were the river opened, it would be to the benefit of a few individuals at the expense of the many and of the permanent preservation of our fisheries.

956. With regard to mackerel-trevally, those I saw this season were of a description never seen before by me.

957. I think the mullet spawn in Prince of Wales Bay and in the bays and flats up to Bridgewater. I have seen the spawn in the fish mature at Christmas. During the spawning season they are not so good as at midwinter.

958. All large fish prey on mullet. The porpoise comes up in March after a small white fish whose name I do not know.

#### THURSDAY, 1ST JUNE, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, R. M. Johnston, Esq., E. D. Swan, Esq., A. Riddoch, Esq., C. T. Belstead, Esq., A. G. Webster, Esq., Curzon Allport, Esq., John Swan, Esq.

#### MR. WILLIAM SAVILLE *examined*.

959. *By Chairman.*—My name is William Saville; I am a resident of Hobart.

960. I have been in the habit of fishing in the Derwent from Hobart to Bridgewater during the last 28 or 30 years, principally with rod and line.

961. I recollect the river before it was closed against netting; there were not then a quarter the number fishing that there are now.

962. I know between 50 and 60 who go out now; formerly I did not know 20.

963. The fish were not so plentiful formerly as now. There are three times as many caught now; they are more abundant.

964. I attribute this to the absence of the seine fishing.

965. *By Mr. Johnston.*—I have occasionally seen evidences of seining lately—since the death of the late water bailiff.

966. *By Chairman.*—Since the river has been closed I think the fish have improved in size.

967. Before the river was closed I considered 3 or 4 dozen a good take, now I would expect 6 to 10 dozen.

968. There are a greater variety of fish taken now than formerly.

969. *By Mr. Johnston.*—When seines were permitted to be used I have seen great quantities of young fish lying destroyed on the shore. I think they were mullet and native salmon.

970. I know the paper-fish; I have seen some of these destroyed by the seine.
971. I have seen lots of young bastard trumpeter, perch, trevally, flathead, and rock-cod lying on the beaches. I have seen these in numbers. I should say I have frequently seen a quarter of a bushel at a time. I inferred that they were destroyed by seine nets.
972. I fancy the upper waters of the Derwent act as a nursery for the young fish.
973. I think the closing of the Derwent has benefited deep sea fishing.
974. Although I have only seen the number of young fish I have mentioned, I have no doubt that large quantities which I have not seen have been washed away by the tide; as evidence of this I have seen quantities floating in to the shore.
975. I believe I know where the mullet spawn,—I think Prince of Wales Bay. About November I see great quantities of very small mullet in New Town Bay.
976. Some 20 years ago when I fished at the wharf I caught fish as fast as I could pull them in; now, either owing to traffic of steamers, or the gas works, they are not to be caught there in such abundance as further up where they have so much increased.
977. *By Chairman.*—To open the river to netting would be very detrimental to permanent fishing.
978. The number of anglers is greatly increasing year by year.
979. *By Mr. Allport.*—I know of none who make a living by angling with rod and line.
980. I have seen the English salmon caught up to 7 lbs.
981. *By Mr. Belstead.*—I have seen one caught by a bait of flathead.
982. *By Chairman.*—The best fishing-places are the flat-rock and caves at Risdon, Elwick Jetty, Berriedale, Triffitt's, Austin's Ferry, and Bridgewater.
983. *By Mr. Allport.*—You can fish at the flat-rock all the year.
984. *By Mr. Johnston.*—The snotgall I have caught there up to 1½ lbs. in weight.
985. *By Chairman.*—I have seen large shoals of small fry, numbering millions, and the colonial salmon pursuing them.
986. *By Mr. J. Swan.*—It was about 4 months ago that I saw the evidence of seining I have spoken of. I saw the men getting their nets ready and lighting their fire-pots. It was close to New Town Bay.
987. *By Mr. Belstead.*—Within the last 12 months I have seen dead fish, the result of seining, lying on the shore. This was above Government House.

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MR. JAMES MORRIS *examined.*

988. *By Chairman.*—My name is James Morris; I reside in Hobart. I used to reside at Sandy Bay.
989. I used to frequent the beaches in that neighbourhood. I have got 3 or 4 barrow loads at one time of small fish left by seining in front of Derwentwater and the Arches. This was about 7 years ago, before the river was closed; they were all eatable fish.
990. They were small flounders, flathead, bastard trumpeter, perch, trevally; principally small flounders.
991. *By Mr. Belstead.*—I have been in the habit of fishing with rod and line between Hobart and Bridgewater.
992. Since the river was closed I have not seen evidence of seining in the upper waters.
993. I have seen evidence at Sandy Bay since it was closed; this was about 18 months ago.
994. *By Chairman.*—I have fished up the river before it was closed. You could then get few mullet, but now these fish are very plentiful, as well as other kinds of fish.
995. *By Mr. Allport.*—The fishing has increased every year.
996. *By Mr. J. Swan.*—The fishing is now better than it ever was before. The fish are steadily increasing in number.
997. I have been in the habit of fishing a good deal and still do so. Years ago I fished above Risdon.
998. From Bridgewater to the Cattle Jetties on one holiday I counted over 150 all rod-fishing, and all appeared to be doing well. Places were missed where the fishermen could not be seen by me; there were a considerable number in Prince of Wales Bay, Berriedale, New Town Bay, whom I did not see.
999. The class who go fishing are principally tradesmen, &c.; the fish they catch are a consideration to them and would be utilised.
1000. They go out by late train at night, fishing early in the morning, and return by train in time to go to their work.
1001. I reckon that now there are more fish taken by rod and line than there used to be taken by the seines.
1002. The seines used to destroy small fish. I think that the number of useless fish taken by rod and line is inconsiderable; with the nets they destroy more fish than are marketable.
1003. *By Mr. Allport.*—I used a graball off Cornelian Bay last Thursday. I got some mullet of very large size. The graball was a 2-inch mesh from knot to knot.

1004. *By Mr. Johnston.*—The greatest destruction with mullet nets is amongst the bastard trumpeter.
1005. About January is when you get the small bastards; they are not eatable.
1006. I have taken garfish with hook when mullet-fishing. I have never taken them with a net.
1007. *By Mr. J. Swan.*—I think it would be unwise to open the river to seine fishing; it would ruin the fishing both up and down the river.
1008. *By Mr. Johnston.*—I am thoroughly convinced of that.
1009. I have never seen a stationary net in Brown's River, nor heard of one being set there nor in any other similar stream.
1010. The bream are as numerous there now as formerly, but it depends upon the season.
1011. My experience extends over 9 or 10 years.
1012. The watermen's boats are very largely used now, especially on holidays, for fishing in the bays in the Derwent; that is due to the increase of fish in the river.
1013. *By Mr. Webster.*—The watermen lay themselves out for such work, and keep tackle.
1014. *By Chairman.*—For the benefit of permanent fisheries I would suggest that the mesh of graballs should be fixed at  $1\frac{1}{2}$  inches from knot to knot—that should be the minimum. I do not refer to the nets used for garfish. The mullet nets now used are very destructive to small bastard trumpeter.
1015. *By Mr. J. Swan.*—Such a net would stop all the mullet worth catching.

MONDAY, 5TH JUNE, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, E. D. Swan, Esq., C. T. Belstead, Esq., John Swan, Esq., R. M. Johnston, Esq., Curzon Allport, Esq.

MR. FRANCIS RUSH, *Fisherman*, further examined.

1016. *By Chairman.*—I sometimes catch trevally,—chiefly at the Hippolites and back of the Pillar. They used to be plentiful at Wedge Island.
1017. I have never seen them higher up the coast than the Hippolites.
1018. They are, as a rule, caught about July and August.
1019. They are taken by hook and line.
1020. They are at times taken in large quantities.
1021. I have caught them from 1 lb. to 12 or 14 lbs.—the large ones about 2 feet 6 inches long.
1022. They are a good marketable fish, and are exported.
1023. *By Mr. Johnston.*—I have never seen a snotgall with black patches on the side.
1024. *By Chairman.*—I have seen ova in the large snotgalls in the latter part of July and August—all on the inshore reefs.
1025. *By Mr. Johnston.*—We get them in deep water, from 1 fathom to 6, at the Hippolites. If caught in the kelp, about 2 fathoms. I have got them in water from 10 to 12 fathoms.
1026. We do not as a rule get them at the bottom.
1027. *By Mr. J. Swan.*—The professional fishermen fish for them without a sinker.
1028. *By Chairman.*—I have never seen a mackerel-snotgall.
1029. *By Mr. J. Swan.*—The trevally are sold from 8s. to 12s. a dozen—12 to 14 lb. fish.
1030. They are not equal to trumpeter or carp; they are thought more of in Victoria. They are a good marketable fish. They are about half the value of king-fish.
1031. Their present value for export is about  $1\frac{1}{2}d.$  a lb.
1032. Good trumpeter would be worth 1s. a lb.
1033. King-fish are worth at the present time 1s. 6d. each, weighing from 8 to 12 lbs.
1034. I have taken, some years ago, from 20 to 30 dozen in one day.
1035. *By Chairman.*—It would be a great advantage to fishermen if a freezing chamber were provided on the Melbourne steamers; there would be a large demand in Melbourne for the fish if they could be taken there fresh.
1036. *By Mr. Johnston.*—It would render us more independent of the local market.
1037. *By Mr. E. D. Swan.*—There would be a good supply at times if there was a demand.
1038. *By Mr. J. Swan.*—The local market is glutted when several boats are in at one time with fish.
1039. The snotgall come in every year.
1040. They feed on the "brit."\*
1041. When the "brit" is about fish are abundant; all fish are attracted by it.
1042. When opening the fish I find "brit" in all of them.
1043. I consider "brit" one of the most important articles of food for fish.

\* A small crustacean.

1044. *By Mr. Johnston.*—Barracouta are in best condition when sprats are most abundant; that is, about the present time (June).

1045. When trevally are breaching they are then feeding on brit.

1046. Before rain fish generally breach and come to the surface.

1047. *By Mr. J. Swan.*—I have seen what we call prawns on this coast; I have seen them this season thick in Port Arthur. Last February two years ago they were numerous in the Derwent.

1048. Rock-cod were unusually abundant when they were in the river.

1049. When we speak of feed we usually refer to sprats—this is the local name, and applies to the shoals of small fish.

1050. *By Mr. Johnston.*—I never saw one 6 inches long; as a rule, they are about 4 inches long.

1051. *By Mr. J. Swan.*—This is what I consider the regular feed for barracouta.

1052. As a rule, you do not find the barracouta with the mackerel.

1053. *By Mr. Johnston.*—The sprats might be taken in abundance; they can always be depended on to appear from August to November, being then most abundant about Recherche,—but they are chiefly found in Storm Bay.

1054. *By Chairman.*—I do not know the anchovy.

1055. I have never taken mullet out of a barracouta; I have taken a small sea salmon out of one.

1056. *By Mr. Johnston.*—The barracouta prey upon horse-mackerel.

1057. *By Mr. J. Swan.*—I have never seen mullet in shoals on the surface of the water.

1058. *By Mr. Johnston.*—You would require a floating or a pocket-net to take the sprats in any quantity.

1059. It would be useless to take them unless there were curing establishments for them.

1060. I think this would be a good centre for such an establishment.

1061. *By Chairman.*—The horse-mackerel are sometimes taken in the seine, but are usually taken in a small-meshed graball.

1062. They come in in large quantities at the beginning of winter, and remain until the latter part of August.

1063. They do not come in regularly; they have not been very plentiful this last year or two.

1064. They are a good marketable fish—equal to perch.

1065. If there were appliances for their preservation they could be taken in immense quantities.

1066. I have found mature spawn in them in July and August.

1067. *By Mr. Johnston.*—As to migratory fish, they generally appear first about Port Davey; the movement is from the south west, approaching a north-easterly direction.

1068. *By Chairuan.*—I know the English mackerel; I saw them here a few years ago.

1069. *By Mr. Johnston.*—They rarely appear here. I recollect them on the coast about 6 years ago; all about Storm Bay, working amongst the horse-mackerel.

1070. They were apparently after the brit.

1071. There would be a good market for them if they could be got.

1072. *By Mr. Allport.*—You generally find porpoises amongst the mackerel.

1073. *By Chairman.*—I have caught Bastard John Dorey. They are of no marketable value. You get them at odd times in the graball.

1074. *By Mr. Johnston.*—They are not known as market fish.

1075. *By Chairman.*—I have seen the yellow-tail; they are rarely caught here.

1076. Parrot-fish are good eating, but are not thought so. They sometimes sell in the market.

1077. *By Mr. Johnston.*—They are at times taken in quantities, both blue-heads and others of a darker description. The darkest ones are considered the best.

1078. I have seen the dark ones from  $\frac{1}{2}$  to 2 lbs.; I have seen blue-heads much larger. The blue-head is a much coarser fish.

1079. *By Chairman.*—Rock-cod are principally taken by hook and line.

1080. They are taken anywhere on weedy bottom.

1081. They are a good marketable fish; they are caught from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  lbs. in weight,—what we call the Cape-cod.

1082. *By Mr. Johnston.*—The prevailing colour of the Cape-cod is tawny brown on back, creamy white belly.

1083. They change colour according to the nature of the bottom.

1084. *By Chairman.*—Rock-cod can be taken in large numbers. They are not exported.

1085. *By Mr. Johnston.*—There is a cod called the bull kelp-cod, darker than the other, smaller scales, with flatter head.

1086. *By Chairman.*—Rock-cod spawn in shallow water in June, July, and August.

1087. *By Mr. Allport.*—They were very numerous here 2 or 3 years ago.

1088. *By Mr. Johnston.*—Rock-cod will smoke and cure well. I have smoked and cured them.

1089. Fish are smoked here by sawdust of any description. I use cedar sawdust.
1090. Pine sawdust (I mean ordinary pine used here) takes away the flavour of the fish.
1091. If care were taken as to the sawdust used I think the fish would be much more prized.
1092. *By Chairman.*—I have caught ling,—one occasionally.
1093. *By Mr. E. D. Swan.*—They always sell well.
1094. They reach up to 10 lbs. in weight.
1095. They are taken with hook and line on weedy bottom, about 3 fathoms.
1096. I have never seen ova in them.
1097. Their value in the market is 2s. to 3s. each, for fish weighing 7 lbs.
1098. I catch eels.
1099. A couple of dozen a night is a good take.
1100. They are a good fish for exportation and are thought much of in Victoria.
1101. They are taken with hook, and weigh from 4 lbs. to 20 lbs.
1102. I catch skate sometimes ; they are not thought much of.
1103. I catch crayfish with ordinary hoop net.
1104. There is a particular season for them, June to October.
1105. From latter end of May to August they are in best condition.
1106. They cast their shells at different times in different places, as a rule. 50 miles either way on the coast covers the difference ; there is generally a month's difference between the East and West.
1107. *By Mr. Johnston.*—They disappear for two months, February and March. No hard-shells fished then.
1108. At this time of year male fish are hard-shelled, and female generally soft. The males will then eat the females.
1109. *By Chairman.*—The female fish have shed their ova now ; they spawn in May. This month female fish are very scarce ; they have gone in to shed their shells.
1110. You will not find any females till latter part of next month.
1111. The average weight of full grown male crayfish is 4 lbs. ; the big fish weigh 7 lbs.
1112. *By Mr. E. D. Swan.*—They run much smaller now than they used to ; they are much scarcer.
1113. *By Mr. Belstead.*—This arises from overfishing and catching the female fish.
1114. *By Chairman.*—There average value is 5s. to 6s. a score ; I have got 9s. to 10s. a score.
1115. A 4 lb. fish is called a count fish.
1116. There have been lobster-pots used on the coast ; I do not think them injurious to the fish,—they do not kill them.
1117. *By Mr. E. D. Swan.*—They are not used by our fishermen.
1118. *By Chairman.*—I would not allow a female fish in spawn to be brought to market.
1119. I think that a fish of 10 inches, spread out, would be quite small enough to bring to market.
1120. They are caught all round the coast.
1121. *By Mr. Johnston.*—There is no other injurious practice that I know of which I think it desirable to remove.
1122. *By Chairman.*—The female fish has double claws on the two legs nearest the tail.
1123. *By Mr. Johnston.*—I have never heard of dynamite being used for the capture of fish, and do not think it has been so used.
1124. *By Chairman.*—I can't say that licensing fishermen would do any good.
1125. *By Mr. Belstead.*—I would suggest that a tramway should be constructed at East Bay Neck for the use of fishermen ; I suggest that spot on account of its being specially favourable for landing in stormy weather. All the fish have now to be brought round Cape Pillar, and during the winter months in the struggle to get round the boats have to return to shelter, and the cargo of fish dies and is lost to the fisherman and the market. The efforts to round the Pillar are often at the risk of the fisherman's boat and lives of the crew.
1126. The important fishing-grounds lie from Maria Island to Cape Pillar. That is beyond the dangerous point.
1127. The distance of the tramway would be about 1200 yards from deep water to deep water.
1128. There used to be a tramway at East Bay Neck belonging to private persons, but it has been destroyed.
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MONDAY, 12TH JUNE, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, E. D. Swan, Esq., C. T. Belstead, Esq., John Swan, Esq., Curzon Allport, Esq., R. M. Johnston, Esq.

MR. JOHN BROWN, *Surveyor, examined.*

1129. *By Chairman.*—My name is John Brown. I am a Surveyor, residing in Launceston.
1130. My knowledge of Tasmanian fish, &c. extends over the northern part of the island.
1131. The most important of our indigenous freshwater fish, in my opinion, is the black-fish (*Gadopsis marmoratus*).
1132. As far as my own knowledge extends, there are black-fish in all the northern rivers from the Ringarooma to the Montagu, with the exception of the Tomahawk, the Gawler, and the Rubicon.
1133. *By Mr. J. Swan.*—These are the only three rivers that have not the black-fish.
1134. *By Mr. Johnston.*—I have heard, and I believe it to be correct, that they exist in all the rivers emptying into Bass's Straits, onwards till you reach the Montagu.
1135. They are fairly numerous in all these streams.
1136. The amount of silt coming down from the mines is killing the fish ova in the Ringarooma and other rivers.
1137. Black-fish are highly esteemed as food by prospectors and others.
1138. I have known two men catch 1 cwt. in a night.
1139. Black-fish are caught principally as an article of food.
1140. They grow to a greater size in the Ringarooma than in any other river east of the Tamar.
1141. They are taken from 1 lb. to 10 lbs.,—the average weight 3 to 4 lbs.
1142. I saw 10 fish each over 2 ft. 6 in. in length; they were the result of one night's fishing.
1143. The largest number myself and party have caught were 100,—their average weight  $\frac{1}{2}$  lb. They were taken by a party of four in the South Esk, where black-fish were introduced from St. Patrick's River.
1144. They are to be caught all day,—but night is the best time to catch them, as they bite more readily then.
1145. They are taken by rod and line, the bait used being the large white grub found in the wattle or honeysuckle tree.
1146. A peculiarity about black-fish is, that I could never distinguish the male from the female. I have never seen anything but roe in them, and I have opened hundreds. This is a fact noticed by numerous fishermen.
1147. This applies to all the rivers in which I have seen them.
1148. They are a slimy fish like the eel.
1149. A good take of black-fish can always be depended upon.
1150. To settlers they are of great value as an article of food when other food cannot be obtained.
1151. They can be taken at any time all the year round.
1152. They are sometimes sent from Ringarooma to Launceston by coasting steamers in small quantities, and they are sold at the tin mines to miners by professional fishermen at about 6d. a lb.
1153. I know nothing of their habits of spawning; they always have spawn in them.
1154. *By Mr. E. D. Swan.*—They have been introduced into other rivers by means of live fish.
1155. *By Mr. Johnston.*—They were introduced with very great success into the South Esk from St. Patrick's River by Mr. East, of Perth, and Mr. Harrison, of Launceston. Thirty miles of that river are now successfully stocked.
1156. *By Mr. Allport.*—I have seen black-fish as small as 2½ inches.
1157. *By Chairman.*—Black-fish are also taken in brackish water.
1158. *By Mr. E. D. Swan.*—They have succeeded in every river in which they have been placed.
1159. *By Mr. J. Swan.*—They have been introduced into the Meander.
1160. *By Mr. Allport.*—As to their food—I have found in them shrimps, native trout, and insects.
1161. I think they would take any bait—I believe they would take a mouse.
1162. They are like a rock ling in appearance.
1163. *By Chairman.*—With regard to the alteration in the color of fish it arises, in my opinion, from their being in a clearer and brighter water. This is the case with those put into the South Esk and Meander.
1164. *By Mr. Johnston.*—They partake of the color of the bottom on which they feed.
1165. *By Mr. Allport.*—Over 40 miles of the South Esk has been stocked since they were introduced there 15 years ago; that is, that they have ascended the river.
1166. *By Chairman.*—I know the herring (*Prototroctes maræna*); they are found in all northern rivers, from the East Coast at Swansea, round the North Coast, and on the West as far as the Pieman, (in which river they are very plentiful), excepting the Rubicon.

1167. *By Mr. Johnston.*—I was camped on the Rubicon for 6 months and never saw one rise, and I never heard of anyone catching one there.

1168. I think the cause of their not being there is, that the head waters of the river flow over a limestone country.

1169. *By Mr. J. Swan.*—The lobster is found in the Rubicon.

1170. *By Mr. Johnston.*—The largest herring I ever saw was from the Forth; it weighed nearly 11lb. and was 14 inches long.

1171. *By Chairman.*—The Forth was celebrated for its large fish.

1172. The Mersey, however, is the most prolific river on the North Coast.

1173. *By Mr. Johnston.*—The largest take of herring that I know of was by the late Mr. Thomas Giblin, who caught 46 dozen within 36 hours.

1174. They are not so abundant now as they were, but the fish appear to be increasing again.

1175. Their disappearance was due to some epidemic. The fish were seen in thousands floating down the Mersey, about the same time that they disappeared in all the other rivers of Tasmania. The fins, gill-covers, and eyes were covered with a fungus.

1176. *By Mr. Allport.*—This took place on all the northern rivers at the same time.

1177. The fish all seemed to disappear in one year. The fungus was not observed in any other year.

1178. *By Chairman.*—An old fisherman told me that he used to catch herring in the depth of winter in deep water at the Cataract Gorge, near Launceston.

1179. *By Mr. Allport.*—I find a difficulty in recognising the difference between the small herring and the smelt (*Retropinna Richardsoni*).

1180. Both of them I have seen caught in the shrimping nets in summer time in the lower waters of the Tamar.

1181. By the lower waters I mean the brackish water 20 miles below the confluence of the North and South Esk Rivers.

1182. I have seen small herring, but never less than 3 inches, in the upper waters.

1183. I have noticed their food—a white moth, a beetle, grasshopper, or anything of that kind which might fall into the water.

1184. *By Chairman.*—The freshwater lobster (*Astacopsis Franklinii*) exists in rivers emptying into Bass's Straits, but not in those emptying on East and West Coasts of the Colony so far as I know.

1185. *By Mr. Johnston.*—I know them to be most abundant in the Ringarooma and other large streams,—the largest size weighing between 8 and 10 lbs. They were larger than the largest crayfish.

1186. I have seen them 2 feet across when the nippers were stretched.

1187. *By Chairman.*—They are not to be found in the North or South Esk.

1188. *By Mr. Johnston.*—They are not to be had in large quantities.

1189. *By Chairman.*—They are caught all the year, but they are in their prime in February.

1190. I have counted 250 perfect shaped young lobsters attached to a female; this was in winter.

1191. *By Mr. Allport.*—They are not found in any river which does not possess the unio (*Unio moretonicus*), but they are found in all the rivers in which the unio is.

1192. *By Mr. Johnston.*—I believe they spawn in winter, but I am not certain.

1193. I do not know when they cast their shell.

1194. They are sometimes caught with a hook, but I snare them when I want them.

1195. *By Chairman.*—They go up to the heads of streams, and are found of large size in the shallowest water.

1196. I have never seen them in brackish water.

1197. The silt from the mines is driving these and all other fish away.

1198. *By Mr. Johnston.*—The late Mr. Thomas Giblin about 20 years ago brought 20 lobster down and liberated them in the Derwent.

1199. As far as I know they have never been seen since.

1200. *By Chairman.*—Freshwater eels are in all northern rivers in quantities.

1201. *By Mr. Johnston.*—I have heard of their growing to an enormous size at Ringarooma, up to 33 lbs.; I saw the skin of one this weight. I saw one at Lake River which had been chopped in three places by a water-wheel; it weighed 29 lbs., and was 20 inches in girth.

1202. They are esteemed as food, the smaller ones being most prized.

1203. They come down the rivers in spring to spawn.

1204. They are an important food fish in country districts where there is no regular fish supply.

1205. Freshwater perch (*Microperca Tasmanica*) are found in the North and South Esk. They are largest in the upper waters at Longford.

1206. I do not think them good for food.

1207. The largest I have seen was about 3 inches long.

1208. There were two sizes, the other being 1 inch, or less.

1209. I do not know where they spawn.



1210. I don't think this fish has been introduced.

1211. Some local pools have been stocked from the South Esk.

1212. The other freshwater fish that I know in the northern rivers are—the brindle trout (*Galaxias truttaceus*, var.), found in all head waters; the spotted trout (*Galaxias truttaceus*), found in all streams; the jolly-tail (*Galaxias attenuatus*), found in every river, entering brackish water; the lamprey (*Mordacia mordax*: *Geotria Allporti*), ordinary and pouch.

1213. These are all the freshwater fish I know of.

1214. *By Chairman*.—Freshwater flathead (*Aphritis urvillii*), are unknown in the northern rivers.

### WEDNESDAY, 14TH JUNE, 1882.

*Present*—Matthew Seal, Esq., (*Chairman*), C. T. Belstead, Esq., A. G. Webster, Esq., R. M. Johnston, Esq., Curzon Allport, Esq.

MR. JOHN BROWN *further examined*.

1215. *By Chairman*.—The herring were at one time in Brown's River, and I know them to exist in the Huon and its tributaries, the Esperance, Kermandie, and the Derwent and its tributaries.

1216. *By Mr. Johnston*.—I do not think the pollution arising from sheep-washing caused the disease in the herring. In the rivers least subject to sheep-washing the epidemic was as great as elsewhere.

1217. The waters of rivers are polluted by the washing therein of limed skins to a large extent, which must be very injurious to the fish. This occurs in a dozen places on the South Esk, in the North Esk, Break-o'-Day, and St. Paul's.

1218. I should think suitable places could be constructed for the washing without polluting the South Esk River.

1219. The pollution of the water near Longford is causing the destruction of the English trout; fine fish are found dead on the banks.

1220. *By Mr. Belstead*.—Sawdust being thrown from the saw-mills on the banks into the Piper was supposed to have driven the herring away. This was thought to be the case in the Mountain River also.

1221. *By Chairman*.—Sawing has been discontinued on the Piper, and the herring are now re-appearing there.

1222. *By Mr. Johnston*.—Fixed netting is practised at the mouths of some rivers where the bream come in—the Piper for instance.

1223. *By Chairman*.—I think the law relating to protected fish is carried out in the north as to the close season.

1224. I do not know of gratings being fixed to artificial channels leading from trout rivers, such as mill-races or irrigation drains.

1225. *By Mr. Johnston*.—I do not think that the law as to imported fish is carried out in its entirety—for instance, trout are shot.

1226. *By Mr. Belstead*.—I think that a lot of fish are taken by persons not holding fishing licences.

1227. *By Mr. Webster*.—There is no systematic supervision to see that the laws relating to fish are carried out.

1228. *By Mr. Belstead*.—The cormorants are frightfully destructive to fish.

1229. They are found on the rivers far inland.

1230. I do not know whether they are increasing or diminishing in number.

1231. There are regular rookeries of them on some rivers.

1232. *By Mr. Johnston*.—Another natural enemy of fish is the beaver rat; it exists in all the rivers, but is not abundant. I have always imagined the platypus to be destructive of the ova of fish. They are abundant in all the rivers.

1233. One of the first places where English trout were introduced was the St. Patrick's River, near Launceston, where they became abundant; but now fishermen who used to go there 3 or 4 times in the season have discontinued doing so, because they say the fish are not there. The St. Patrick is one of the big tributaries of the North Esk.

1234. It is about 1400 feet above the sea level.

1235. They seem to be fairly numerous in the North Esk.

1236. They are more widely spread than they were, and keep on moving up stream.

1237. I do not know of any actual decrease in any stream other than the one I have mentioned.

1238. I think upon the whole, therefore, that the fish are increasing.

1239. *By Chairman*.—In the summer time the English fish are taken in the Tamar as low as George Town, and are as big as a mullet.

1240. The protection afforded in the Derwent against netting is hardly applicable to the Tamar, because of the abundance of mud-flats in that river on which the fish can spawn, and where by the natural features of the river seining cannot be practised.

1241. *By Mr. Johnston.*—A good deal of amateur fishing is practised in the Tamar when the fish ascend the river, from November till the first heavy summer rains about March.

1242. A large quantity of native salmon trout and mullet are taken by rod and line, principally young fish 3 inches long to  $1\frac{1}{2}$  lbs. in weight.

1243. A party of 3 or 4 might take 20 dozen, average weight, 4 ozs.; but occasionally a dozen good fish may be caught in a day.

1244. They have not been numerous this year because the shrimps did not come up. I think they follow the shrimps.

1245. This is the first year that shrimps have not been plentiful in the Tamar since I have known Launceston, viz., 15 years.

1246. There is a regular shrimp fishery near Launceston, employing 20 men during the season.

1247. A good many bushels are taken in each trip, *i.e.*, during two tides.

1248. Their value in the market averages 8d. a quart during the season.

1249. There is a considerable demand for them locally.

1250. In a good season more are exported than are consumed.

1251. I have no doubt but that this industry could be enlarged.

1252. The fishermen first look for them in the Tamar, at Swan Point, about December, and they are then followed up. I believe they spawn up the North Esk.

1253. The nets are set principally at ebb tide.

1254. *By Chairman.*—The net used is an open purse net.

1255. They are set on the mud bottom at half ebb tide.

1256. Hand nets are never used.

1257. *By Mr. Johnston.*—The net is 6 feet in diameter, length 10 feet.

1258. Where the current is strong they catch them with the boat stationary.

1259. There is no fish market in Launceston.

1260. *By Chairman.*—There are hundreds of flounders exposed for sale there under 9 inches in length.

1261. *By Mr. Johnston.*—Fish are hawked about for sale, and there are one or two fish shops.

1262. There is no special officer set apart to see that the law is carried out; but informations are laid sometimes by constables.

1263. Launceston is supplied with fish principally from Hobart.

1264. The fish supply from George Town consists of flounders, trumpeter (red bastard), gurnet, flathead, gar-fish, mullet, salmon trout, and rock-cod,—these are the principal.

1265. Port Sorell is a great fishing-ground, one of the best.

1266. *By Chairman.*—Well-boats are not used at Launceston; the fishermen there have not the proper means to bring the fish alive to market.

1267. Flounders are at a certain season unfit for food—November to February. Their sale should, I think, be prohibited during these months.

1268. *By Mr. Webster.*—I think it desirable that, for the protection of fish and fisheries generally, a Fisheries Department should be established, with a competent Inspector; I think it the very best thing that could be done.

THURSDAY, 15TH JUNE, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, A. G. Webster, Esq., A. Riddoch, Esq., R. M. Johnston, Esq., C. T. Belstead, Esq., Curzon Allport, Esq.

MR. WILLIAM HENRY MARTIN, *Fisherman, examined.*

1269. *By Chairman.*—My name is William Henry Martin. I am a fisherman.

1270. I have been fishing out of Hobart between 17 and 18 years.

1271. My experience is limited to Tasmania.

1272. I fish deep-sea fishing with an ordinary open well-boat, its dimensions being 7 ft. 5 in. beam, 33 ft. 6 in. long, 2 ft. 7 in. deep.

1273. *By Mr. Belstead.*—That is about the average size of the best open boat used here.

1274. *By Chairman.*—I fish from Maria Island, on the East Coast, to Whale Head, on the South.

1275. I use the graball net, hook and line, and crayfish nets.

1276. My graball measures from 30 to 40 fathoms long, 8 to 9 ft. deep,  $2\frac{1}{4}$  in. mesh from knot to knot.

1277. We use a variety of lines in fishing; in deep water we use about 120 fathoms,—this would be the outside length,—about  $\frac{3}{8}$  in. in circumference.

1278. We usually fish in deep water of from 40 to 45 fathoms.
1279. The graball nets are set in water of from 6 ft. to 12 fathoms. They are generally set in the kelp.
1280. When deep-sea fishing we generally try for coral or black pebble bottom.
1281. *By Mr. Johnston.*—The black gravel is a sort of ironstone or slate.
1282. *By Chairman.*—On coral bottom I fish for real trumpeter,—the large fish.
1283. They run in weight from 5 to 40 lbs.
1284. The bait used is principally crayfish.
1285. *By Mr. Johnston.*—The hook used is No. 4.
1286. *By Chairman.*—I often see roe and milt in the real trumpeter, about July; it is according to where they are caught.
1287. I think they are later at Seymour than at Tasman's.
1288. *By Mr. Allport.*—They get late northwards.
1289. They shed their ova in October or November.
1290. I believe they shed the ova on the reefs where we catch them.
1291. There is deep water between the reefs and the shore.
1292. *By Mr. Johnston.*—The reefs generally take up a position corresponding to the leading directions of the principal rock formation of the shore.
1293. *By Chairman.*—Off Tasman's the reefs are  $3\frac{1}{2}$  miles from shore.
1294. I have caught trumpeter 16 miles from the main land, off the reef Pedra Blanca; and I believe there are reefs not now fished if they were looked for.
1295. The water there is shallow, about 25 fathoms.
1296. That spot is seldom fished on account of its distance and its exposure to the full swell of the ocean.
1297. *By Mr. Johnston.*—Other points like that might be discovered off the land if searched for.
1298. We are guided by the natural trend of the rocks on shore when we are searching for reefs.
1299. On the reef off Pedra Blanca I caught rock-gurnet, rock-cod, very small white silver perch, real trumpeter (very large, and a good take), school trumpeter, sharks, &c.
1300. *By Chairman.*—I think there is a falling off in the take of real trumpeter on the known grounds.
1301. I attribute that to so many being caught.
1302. I think it possible that the fish may get shy and make off. The fish bite very fast and may get pricked and thus scared.
1303. *By Mr. Johnston.*—In 80 fathoms the bite is as distinct as in shallower water. The trumpeter bite is a heavy solid sustained bite, repeated 2 or 3 times.
1304. *By Chairman.*—Big trumpeter are most plentiful in May and June; they are then taken anywhere on known grounds.
1305. *By Mr. Allport.*—I sometimes take spent fish on the same grounds, about November or December, but they are not plentiful, and very poor.
1306. The spent fish I should think would take about 3 months to pick up again.
1307. I never got a roe fish and a spent fish on the same bank.
1308. *By Mr. Johnston.*—I think they spawn where they feed.
1309. *By Mr. Allport.*—I don't think the spent fish go elsewhere to pick up again.
1310. *By Mr. Johnston.*—I have caught a small trumpeter corresponding in colour, &c. to the large trumpeter, 1 ft. to  $1\frac{1}{2}$  ft. long, and 1 lb. weight.
1311. I have never caught school fish on the same banks.
1312. *By Chairman.*—We know the school fish by the small head and thin under lip.
1313. The large fish has the lower jaw protruding.
1314. *By Mr. Johnston.*—I have never found ova in the school fish; and have always found these fish more in shore.
1315. The same general colour prevails in the school fish, and the large fish also have a prevailing colour.
1316. I think the bottom affects the colour. In a few hours the colour is affected.
1317. We take real trumpeter quite dark, and in a short time they will change colour, according to the bottom of the well of the boat.
1318. I don't think the school fish are half-grown trumpeter; I think them a different variety to the large ones.
1319. I think the school fish leave our coast to spawn.
1320. *By Mr. Allport.*—The school fish maintain their own characteristics as they grow in size.
1321. We call the deep water school fish white-bellied. I think this another variety. I never saw them spawn.
1322. The small real trumpeter have a thicker lip than the larger fish of the inshore school variety.

1323. *By Chairman.*—Trumpeter live and feed well in the well of the boat.
1324. *By Mr. Johnston.*—There are three kinds of real trumpeter,—the white-bellied, which grow up to 30 lbs., the school fish, and the larger one, called “old man trumpeter.”
1325. *By Mr. Allport.*—I don’t think the white-bellied one of 19 lbs. would ever become an old man fish.
1326. The head is quite different; the one has a blunt square head (old man), the other a pointed, the white-bellied (school fish).
1327. *By Chairman.*—The trumpeter is a good marketable fish; there is not a demand in Hobart for all taken,—they have to be sent away.
1328. The price we get for them for export used to be from £2 to £4 per dozen, averaging 15 to 40 lbs. in weight.
1329. *By Mr. Belstead.*—The price would depend upon the quantity in the market.
1330. *By Mr. Johnston.*—The price which most prevails is £2 10s. a dozen for export. I have known them bring £6 a dozen.
1331. *By Chairman.*—If there were freezing chambers in the steamers we could depend upon getting better prices, as fish could then be delivered in good condition in the other Colonies.
1332. I know the bastard trumpeter. The nets are set for them about the edges of kelp, or on inshore coral reefs; water in depth from 6 ft. to 12 fathoms.
1333. There are two kinds of bastard, the red and the white-bellied.
1334. I think the white-bellied fish migrate, but not the other.
1335. They are taken all round the coast where I fish, wherever there is suitable ground.
1336. The best time of year for white fish is latter end of February to end of March.
1337. At that time they are always in good condition.
1338. *By Mr. Allport.*—Outside those months odd white fish are taken, and always in good condition.
1339. The smallest white one I have caught was about 2 to 2½ lbs.
1340. They are taken earlier on the East than on the West Coast.
1341. *By Mr. Johnston.*—We get odd ones from January to March. March is the height of the season.
1342. *By Chairman.*—I think they go into deeper water to spawn.
1343. I never find spawn in the white fish.
1344. *By Mr. Johnston.*—I have often looked for spawn in them.
1345. I have heard that the spawn is in the fat, but I have never seen it there, and I have opened many a hundred dozen.
1346. *By Chairman.*—I never catch a bastard on a hook in deep water; I catch odd ones in shallow water.
1347. *By Mr. Johnston.*—They might be in deep water and we not know it.
1348. *By Chairman.*—They do not carry so well in the boats as the real trumpeter.
1349. There is a great falling off in the take of the white fish. I think that is due to over fishing.
1350. We catch very small bastards sometimes,—about 3 inches long.
1351. I think the red and white are distinct fish.
1352. *By Mr. Johnston.*—I have never seen the young of the white fish.
1353. The prevailing size of the red is not so large as the white; only odd full sized red are got amongst the white.
1354. *By Chairman.*—The white fish are a good market fish,—in rank next to the real trumpeter.
1355. *By Mr. Johnston.*—The red ones taken amongst the white are then in good condition, and better eating than at other times.
1356. I have noticed the roe in the red bastard in June.
1357. I have taken them with spawn in them at Black Jack.
1358. The ovaries very small, darkish red in colour,—a little fat on them.
1359. It is only recently I have noticed this—2 years ago.
1360. I noticed it at the time in every one I split.
1361. I split some yesterday from Cloudy Bay with roe in them. They were fish about a foot long.
1362. I have seen them both with milt and roe.
1363. At this time of year and a little later they spawn in 2 to 2½ fathoms in the two places I have named.
1364. Stony bottom, with long black grassy weed—a rough, weedy bottom.
1365. *By Mr. Allport.*—The roe of the red which I saw in June looked ready for starting.
1366. They were in better condition than they would be before that time.
1367. I don’t think they improve towards spawning,—the feed being better in summer the fish are then in best condition.

1368. I think the bastard trumpeter lives on suction.

1369. *By Chairman*.—The red fish may be taken amongst the white occasionally, but they are taken generally in shallower water.

1370. *By Mr. Allport*.—The red bastard are poorest about August; they are spent fish.

1371. *By Chairman*.—Perch are generally taken with the trumpeter,—the big deep-water perch with the old man trumpeter, and the black with the school trumpeter.

1372. They are plentiful from October to latter end of December.

1373. The perch are falling off in quantity; this applies to both black and dark.

1374. Perch are very generally distributed.

1375. I find roe in them, but I don't remember the month.

1376. Magpie perch are occasionally taken, but are not considered a market fish.

1377. Perch are usually taken by hook and line—same bait as trumpeter.

1378. *By Mr. Johnston*.—There is a perch we call the red perch taken on the trumpeter ground all the year.

1379. In some places they are abundant.

1380. The reason why they are not brought to market is, that they will not live well in the boat, and are not esteemed in the market.

1381. *By Chairman*.—Carp are not taken in quantities,—an odd one occasionally taken in bull kelp in the graball.

1382. It is a very fair market fish.

### WEDNESDAY, 21ST JUNE, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, A. Riddoch, Esq., R. M. Johnston, Esq., A. G. Webster, Esq., C. T. Belstead, Esq., John Swan, Esq., Curzon Allport, Esq.

MR. WILLIAM HENRY MARTIN, *Fisherman, further examined.*

1383. *By Chairman*.—I know two kinds of flathead,—one called the deep-water flathead.

1384. *By Mr. Johnston*.—There is no special name for that one; if talking to another fisherman of it I would call it the big deep-water flathead.

1385. It is darker in color and rounder than the other, and with much stronger and longer teeth.

1386. It is coarser than the inshore one.

1387. Very few are now brought to market—they are not to be had.

1388. They used to be caught all the year, like the inshore one.

1389. The inshore flathead are good food.

1390. In winter a few boats take them.

1391. They are taken then to supply the wants of the market when other fish are scarce.

1392. Their price is from about 4d. to 8d. a dozen, and they are used for local consumption.

1393. All are caught on the bottom by hook and line.

1394. I have noticed spawn in them, but do not remember the month in which I saw it.

1395. I think they are ravenous fish, and would be dangerous where other fish spawn.

1396. *By Chairman*.—I have caught gurnet on trumpeter grounds.

1397. They are not caught in any quantity.

1398. They are seldom brought to market, and are not thought by the fishermen to be worth saving.

1399. *By Mr. Johnston*.—They are not in favour in the market.

1400. The red gurnet is more in favour in the market; it has scales on the head and is darker in colour than the other.

1401. We could catch a good many more than we do if we wanted them.

1402. They are taken at Tasman's in 30 to 40 fathoms of water.

1403. I do not know their spawning season.

1404. They live on similar food to the real trumpeter.

1405. They would sell at about the same price as small perch.

1406. *By Chairman*.—Whiting I never see or catch.

1407. *By Mr. Johnston*.—I never caught any in deep water; I am principally a deep-sea fisherman.

1408. *By Chairman*.—I catch king-fish, and have caught them from Maria Island to Whale Head.

1409. They strike the coast on the south west and travel to the eastward.

1410. I have no idea how far they travel up the coast.

1411. They generally appear about March, but we sometimes see a few in December.

1412. They remain until the latter end of July.
1413. They follow the horse-mackerel.
1414. I think the horse-mackerel follow the smaller mackerel.
1415. The king-fish are a surface fish, taken in 8 fathoms,—on bright nights in 10 or 12 fathoms.
1416. A good catch would be 45 dozen, taken between 6 P.M. and 11 P.M.,—two men fishing.
1417. I think they come on the coast every year, but are not always inshore.
1418. The indication of their presence is the appearance of the horse-mackerel.
1419. Last year we caught 25 dozen one night, but it is 5 or 6 years since they were plentiful.
1420. *By Mr. Johnston.*—They do not stay so long some years as they do in others.
1421. I think we have thinned them down a great deal.
1422. When the horse-mackerel are very abundant, the king-fish are also abundant.
1423. The mackerel disappear and then the king-fish also disappear.
1424. When the main body of the mackerel disappear, the main body of the king-fish appear to follow them.
1425. *By Chairman.*—As a rule they are in good condition when taken.
1426. They have ova in them at the end of the season.
1427. I do not think they spawn on the coast.
1428. *By Mr. J. Swan.*—When we see them full-roed we expect them to leave directly.
1429. I have noticed them swimming on the surface of the water, sick.
1430. I think this must have been caused by breaching, and in following fish; when they once leave the water they cannot get down again.
1431. Something inside of them bursts; they are then very much distended.
1432. No physical cause for this occurs to me.
1433. I have noticed the ling come to the surface in the same way in cold southerly weather, get upon the surface, and appear unable to go down again.
1434. *By Mr. Johnston.*—I have seen this with a few barracouta, but I think that was owing to some accident to the fish.
1435. I don't think any surface fish have the same habits as this.
1436. *By Mr. J. Swan.*—When on the king-fish ground, great numbers of sharks are prevalent.
1437. I do not think they feed on the king-fish, but on the mackerel.
1438. Sometimes, on odd occasions, the sharks will seize the hooked king-fish.
1439. I have on the king-fish ground taken a shark warm-blooded. I know from my own observation that it is so. He had spout-holes, and a smoother skin than the ordinary shark,—cutting-teeth something like the blue shark.
1440. *By Mr. Johnston.*—It had two dorsal fins; I did not notice whether it had an anal fin.
1441. King-fish when plentiful bring about 3s. a dozen in the market.
1442. *By Mr. Webster.*—The lowest we got lately was 6s. a dozen.
1443. *By Chairman.*—Sometimes as high as £1 per dozen has been got for them.
1444. *By Mr. Johnston.*—The heaviest king-fish I have caught was about 9 lbs.; this was when the fish was split and cleaned.
1445. *By Chairman.*—It would pay to catch them at 3s. a dozen when plentiful, if there was a demand for them for preserving purposes.
1446. *By Mr. Johnston.*—I never knew a second kind of king-fish.
1447. The smallest I have seen was 15 inches long.
1448. I don't think the fry come on the coast, and from this I do not think the king-fish spawn on this coast.
1449. The demand in Hobart is very small, and we take them principally for export. Melbourne is the chief market.
1450. *By Mr. J. Swan.*—The principal natural food of the king-fish is mackerel.
1451. I have never seen brit in them, but I have seen pieces of salmon.
1452. *By Mr. Johnston.*—At the same time as the king-fish are feeding on mackerel the latter feed on brit.
1453. The mackerel and mackerel fry work together.
1454. The mackerel fry will feed on brit.
1455. *By Chairman.*—The season for barracouta is the latter end of January till about the end of June.
1456. *By Mr. Johnston.*—Odd fish are caught later.
1457. *By Chairman.*—I think they come as the king-fish do.
1458. They set inshore every year, and can always be taken in large quantities during the season.
1459. *By Mr. Webster.*—I think they are on the coast all the year, but will not rise to the surface in cold weather.

1460. They are taken with a hand-jig.
1461. A good take of barracouta, with two men fishing, would be from 40 to 60 dozen.
1462. We have not to go more than 20 miles from town for them—all about Storm Bay.
1463. *By Mr. Johnston.*—They might be taken on similar ground elsewhere on the South Coast.
1464. I have fished in Bass' Straits. The barracouta are abundant there, but much smaller in size. Their season would commence there in November.
1465. They take brit and sprats as food.
1466. The conditions of weather governs the number to be taken.
1467. Sprats are always abundant during the barracouta season.
1468. *By Chairman.*—The average price for barracouta is about 3s. a dozen.
1469. They could be taken in large quantities if there were a demand for them.
1470. *By Mr. Webster.*—The average weight, 5 to 6 lbs., split fish.
1471. *By Chairman.*—They are chiefly split and sent to Melbourne.
1472. They are taken sometimes full of mature roe.
1473. I have caught them very small—as small as a gar-fish.
1474. I think they spawn on this coast.
1475. *By Mr. Johnston.*—Barracouta do not attack large fish—only the brit and sprats.
1476. *By Chairman.*—Snotgall are taken at the Friars and Hippolites.
1477. They are taken on the surface, and can be got in quantities.
1478. They are most plentiful from April to June, in shallow water in the kelp.
1479. *By Mr. Johnston.*—They are about the coast all the year.
1480. The young ascend the river Derwent and other estuaries in large numbers.
1481. The upper waters of estuaries are nursery grounds for these, and also for young mackerel, perch, bastard trumpeter, or paper-fish, and such like.
1482. They enter Ralph's Bay and other bays in large numbers.
1483. If seines were largely used in such places they would certainly destroy great numbers of young fish.
1484. I think if large numbers of young bastards were destroyed the sea-fishing would be injured.
1485. I think, in the interests of the middle grounds fisheries, these nursery grounds should not be disturbed.
1486. The silver bastard would be middle ground fish, the deep trumpeter deep-sea ground fish.
1487. The boats for these grounds would be of three classes,—small inshore, medium middle ground, and large deep sea.
1488. *By Mr. J. Swan.*—I think the present kind of boat quite safe.
1489. Within the last five years only two boats have been lost, with four men.
1490. Since I have been fishing five boats have been lost and the fishermen drowned—10 men.
1491. I don't think it would be of service to have the boats decked.
1492. *By Mr. Belstead.*—I think the loss of boats might be the result of bad handling by the crew.
1493. *By Mr. Johnston.*—There are five types of boats used for fishing out of this port.
1494. *By Mr. J. Swan.*—I have seen the English mackerel.
1495. *By Mr. Johnston.*—The same enemies follow these which follow the horse-mackerel.
1496. I don't think they feed so much upon brit.
1497. I think the horse-mackerel feed solely upon brit.
1498. *By Chairman.*—Very few horse-mackerel are brought to market.
1499. John Dorey are frequently taken in the graball.
1500. They are plentiful, but are hard to catch—they will not mesh well, nor will they bite.
1501. They are not a good market fish, but are about the same value as the bastard trumpeter.
1502. Silver-perch are occasionally caught in the kelp in the graball.
1503. Rock-cod are taken all the year. The latter end of September to the beginning of December is the best time for them.
1504. They are then full of spawn.
1505. I think they come into the shallow water to spawn.
1506. 5 to 6 lbs. is the largest taken.
1507. I don't think they would cure well.
1508. I catch very few ling. They are a good market fish and fetch a fair price.
1509. *By Mr. Webster.*—I have picked more up than I have caught,—they were blown fish.
1510. *By Chairman.*—I know a fish which we call the sprat; it looks like a sardine.
1511. They could be taken in large quantities if there were proper appliances for their capture.
1512. Conger-eels can be taken at any time in small quantities.

1513. They are a good market fish.
1514. The largest I know of weighed 40 lbs.
1515. We never bring leather-jacket, skate, or stingray to market,—there is no sale for them.
1516. I have caught English salmon, about 24 inches long, as low as Great Taylor's Bay in D'Entrecasteaux Channel.
1517. The heaviest I have caught was taken in Barnes's Bay, and weighed 9 lbs.
1518. I have never taken them elsewhere than in D'Entrecasteaux Channel.
1519. The best season for crayfish is the winter; they are then in good condition.
1520. They are not as plentiful as they used to be.
1521. This is owing to the destruction of so many small fish and to overfishing.
1522. *By Mr. Belstead.*—I think that no fish smaller than 10 inches should be allowed to be brought to market.
1523. *By Chairman.*—I don't think the female in spawn should be brought to market.
1524. *By Mr. Webster.*—I think it would be a great advantage to the public to have a close season, from the beginning of November to the latter end of December, as the majority of fish are then soft-shelled and unfit for food.
1525. It would be well to prohibit the sale of soft-shelled crayfish, and perhaps that would be better than having a close season.
1526. *By Mr. Belstead.*—There is a good market for crayfish, both for home consumption and export.
1527. The average price for full fish is 5s. a score.
1528. *By Chairman.*—They are taken in the kelp, with a hoop net.
1529. I have taken them with a hook on trumpeter ground—an occasional one. I have taken a small one, about 2 inches long, out of a trumpeter.
1530. They always come inshore to cast their shells.
1531. *By Mr. Belstead.*—We catch crabs occasionally with the crayfish.
1532. A tramway across East Bay Neck might benefit a few,—it would benefit those men who go to the eastward. I don't think that the benefit to be derived would be worth the undertaking.
1533. *By Mr. Webster.*—I have never heard of dynamite being used by fishermen on the coast.
1534. *By Chairman.*—I think the river Derwent being closed against seining is a benefit to deep-sea fishermen, because, as I have already stated, that river acts as a nursery for the young fish.

### FRIDAY, 23RD JUNE, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, J. Swan, Esq., A. G. Webster, Esq., A. Riddoch, Esq., C. T. Belstead, Esq., R. M. Johnston, Esq., Curzon Allport, Esq.

MR. JOHN SWAN, *Sheriff and Inspector of Police*, examined.

1535. *By Chairman.*—I have had considerable experience in fishing of most kinds.
1536. I have visited and fished in most of the rivers in Tasmania from Circular Head to Southport—the North and East Coasts of the Colony.
1537. I have not been beyond Duck River. I have not fished in that river.
1538. I have fished in the Bay at Circular Head, where I caught only mullet.
1539. *By Mr. Johnston.*—I have not been on the West Coast.
1540. *By Chairman.*—I have fished in the Cam, where I caught the largest blackfish I have seen, weighing 6lbs. I doubt the existence of such fish of very much greater weight.
1541. Blackfish are very deceptive in appearance as to weight.
1542. The head and shoulders of the blackfish are very large; the mouth and head especially, very like in shape, marking, and general appearance to a ling, but the head is large in proportion.
1543. In the Cam I caught herring and lobster.
1544. At Table Cape (Wynyard) I have seen a fisherman with a net, and he got flounders, soles, and mullet.
1545. *By Mr. Johnston.*—The water is very shallow there.
1546. *By Chairman.*—The fisherman drives a stake into the sand, attaching one end of a plain net, and then works it like a seine. There are no wings to the net, and in this respect it is like a graball.
1547. The sea salmon at times come into this river in large numbers.
1548. I have fished in the Emu at Emu Bay.
1549. In the upper parts I caught blackfish and herring. Native salmon and mullet abound near the mouth. Sand-mullet are occasionally caught outside the river. I have seen very good bastard trumpeter (silver and red) and magpie-perch taken in a graball.
1550. There are numbers of parrot-fish; blue-heads, the mature parrot-fish, are eaten there, but they are not marketable in the South.



1551. Many fish are taken in fish-traps along that coast—mullet, garfish, and salmon,—I have heard of pike being so taken occasionally.

1552. I fished the Leven, where the same fish are caught as mentioned before,—mullet, salmon, herring, and blackfish.

1553. The Forth is a very fine river for herring.

1554. *By Mr. Johnston.*—I have never seen a herring over  $\frac{3}{4}$  lbs. in weight.

1555. *By Chairman.*—In the Forth I have also caught, with a rod, large gurnet when feeding on a reef in shallow water.

1556. The Mersey contains fish similar to the other rivers I have mentioned.

1557. It is impossible to imagine a finer river for trout. Now there are great quantities of herring in it.

1558. In the lower or tidal waters the same fish as I have already mentioned are to be found—mullet, sea trout, gurnet, rock-cod, &c.

1559. *By Mr. Johnston.*—Blackfish are in all the rivers I have named.

1560. *By Chairman.*—In Green's Creek, running into Port Sorell, I believe bream are to be found. I am also told that brown trout have grown there to a great size.

1561. Bream are in the Mersey also, but are not abundant.

1562. In the Tamar I have caught perch and pike, the perch being very uncommon there: this fish seems scarcely to go beyond Banks' Straits.

1563. *By Mr. Johnston.*—There is no deep-sea fishing in the Tamar in the sense understood in the South.

1564. I have no practical experience of Port Sorell, but I know that they there catch gurnet, flounders, rock-cod, flathead, and mullet.

1565. It is comparatively shallow water there.

1566. The only place where I have seen bastard trumpeter caught in a graball, as we use it in the South, was at Emu Bay.

1567. I know that the bastard trumpeter is called trevally on the northern side.

1568. *By Chairman.*—I have fished the Lower Piper. There are bream there. I only caught sea salmon. Blackfish are found higher up.

1569. I have fished the Boobyalla and Ringarooma. In these rivers are to be found sea salmon, mullet in large numbers, bream, silver trevally also in large numbers.

1570. The Ringarooma is the farthest river to the eastward where I have seen lobster and blackfish.

1571. I have fished at a place called Anson's Lagoon, under Eddystone Point, where bream are larger and more numerous than in any other place I have visited, and another fish which I have not seen elsewhere in Tasmania, and believe to be identical with the Gipps Land perch (*Lates colonorum*.)

1572. *By Mr. Johnston.*—I found this perch in shallow water. I saw 30 or 40 specimens in the course of two days; they weighed from  $1\frac{1}{2}$  to 3 lbs. each. They were nearly all netted by Chinamen.

1573. On examining them I found their stomachs filled with small anchovies.

1574. The Chinese fishermen dried them and sent them to Thomas's Plains.

1575. I have eaten them; they are a very fair fish.

1576. I got them at the end of June or beginning of July.

1577. It was in the running part of the river, between the confluence of fresh and salt water.

1578. As far as I know they do not exist in any other river in Tasmania.

1579. I never found them at George's Bay, but I heard that a few were got there, but I believe the fish got was of another description,—viz., skip-jack,—a specimen of one of which was sent me.

1580. I brought a specimen of the perch to Hobart, which has been scientifically examined and described.

1581. The Chinamen cut a slit down the back of the fish, then put them in a composition which they keep secret, and hang them up for drying, without removing the intestines.

1582. The Chinese catch the fish by graball nets, which they set and also draw as seines.

1583. Anson's Lagoon is sanded up by a bar during the greater part of the year. I observed there sand-mullet.

1584. George's River was once a great place for herring, but the fish became scarce at the time of the general disappearance of these fish.

1585. The disappearance was quite general.

1586. *By Mr. Allport.*—This was at the same time that they became scarce in the South Esk and the Derwent.

1587. *By Chairman.*—I never heard of blackfish in the George's River. At the mouth of it there are bream; and in the bay I have taken quantities of perch, salmon, mullet, flounders, and a little fish like the stranger which they call sand or weed mullet,—the latter fish are numerous,—rock-cod, flathead, and all the fish which are caught towards the south.

1588. *By Mr. Johnston.*—From this point the fish become more of the character of those caught towards the south.

1589. The skipjack taken there has, I believe, been mistaken for the Gipps Land perch.
1590. I know Diana's Basin. It contains sand-mullet, bream, and ordinary mullet.
1591. The Scamander contains the same kinds of fish—mullet, flounders, &c. The bream are very numerous.
1592. In that river I caught the "sweep" for the first time,—but only two.
1593. The Four-mile creek, below Falmouth, the same as the Scamander.
1594. In the Swan River bream are numerous.
1595. There is a place between these two, between the Water Meetings and Swansea, where black-fish are said to be; but I doubt it.
1596. I have not fished the Prossers', Lisdillon, or Bream Creeks. Bream are in all these.
1597. In Fortescue Bay there is a good creek for bream.
1598. I have never heard of herring in any river between Four-mile Creek, near Falmouth, to the Derwent, nor have I heard of their existence between these points.
1599. I have fished a bream lagoon at Adventure Bay.
1600. I have seen bream as far down as Port Esperance, and in Southport.
1601. I have not heard of bream being caught in the Huon. Herring are the only indigenous fish of any consequence in the fresh water portion of that river.
1602. The smaller fish are common to all the streams.
1603. *By Mr. Allport.*—The large black cormorants were comparatively unknown in the rivers in the interior of Tasmania until about the time of the herring scarcity, when these birds suddenly became plentiful all over Tasmania.
1604. *By Mr. Belstead.*—As they live entirely upon fish they are necessarily destructive.
1605. *By Mr. Johnston.*—A reward for their destruction was tried; it failed. I do not think it worthy of repetition, unless on a large scale; it is a question of funds.
1606. *By Mr. Allport.*—I know that small fish of several varieties pass up the Derwent in large numbers—the smelt, the silver-bellies, and the jolly-tail.
1607. I have seen fish like one of these in the Elizabeth and St. Paul's Rivers.
1608. I think several varieties travel in company up the Derwent in the spring. I have seen one of them far up in the fresh water.
1609. I have not found bream numerous in any river on the North Coast. They may be seen in some of them in shoals occasionally; but they seem much more plentiful along the East Coast, where there are no blackfish. The herring has a very wide range, being found in the Pieman and other Western rivers.
1610. Eels, native trout (*Galaxias truttaceus*: *G. attenuatus*), are almost universally distributed.

WEDNESDAY, 28TH JUNE, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, John Swan, Esq., R. M. Johnston, Esq., A. Riddoch, Esq., Curzon Allport, Esq.

MR. WILLIAM GREEN *examined*.

1611. *By Chairman.*—My name is William Green; I am a resident of Hobart.
1612. I have had 25 years' experience of trawling in the German Ocean.
1613. I served my apprenticeship to it.
1614. I have used a trawl in Tasmanian waters—in Frederick Henry Bay, Saltwater River, Norfolk Bay, Adventure Bay, Franklin Island.
1615. *By Mr. Johnston.*—The deepest water in any of those places was from 12 to 15 fathoms.
1616. The trawl was of 18 feet beam, with two trawl irons of 60 lbs. each.
1617. It was a small-sized trawl compared with those I used at home.
1618. The mesh was 2½ inches at bottom to 4 inches at top; it had the usual pocket or trap.
1619. The boat I had was an open well-boat, about 37 to 40 feet long and 9 feet beam.
1620. I could not have gone far from the coast in such a boat, or used a net of greater beam than I had.
1621. The bed of the bays named appeared suitable, but there was so much weed and kelp that the net could not be drawn along.
1622. The weed prevented my keeping the trawl down for any length of time.
1623. In consequence of this the trawl had frequently to be inverted, and any fish in it were thus lost.
1624. The same objection applies to all the bays I tried.
1625. I am sure there is no chance of success in any of our bays with the trawl-net.
1626. I should say the most likely place for trawling would be in Bass's Straits.
1627. There is a good current running there which would keep the bottom clear of weed.

1628. In going to new ground it is of the utmost importance to use the lead to sound the bottom and discover its nature.

1629. That is the usual process in the German Ocean.

1630. If fishing were attempted in Bass' Strait it would require a vessel of from 16 to 20 tons; a vessel of that size would carry a beam of 30 feet.

1631. A beam of 30 feet would be sufficient to try any experiment on this coast.

1632. A beam of that description would require two irons of about 1 cwt. each to sink it.

1633. It would take four men to man such a boat.

1634. The fish are dead when caught in the trawl. It would be useless to go far away without some means of preserving the fish,—ice, or some other substance.

1635. Salt might answer for some fish; ling could be salted. I think ling and large cod (Cape cod) would be taken in a trawl.

1636. *By Mr. J. Swan.*—I know the fish called here the Cape cod.

1637. The trawl could not be worked on a reefy ground.

1638. *By Chairman.*—It is absolutely necessary to have a sandy or muddy bottom for trawling.

1639. *By Mr. Johnston.*—I have hoisted a stone of 2 tons taken in a trawl.

1640. *By Chairman.*—I was not successful in my experiment in this Colony.

1641. I caught a few flounders, native sole, skate, but no other fish in particular.

1642. *By Mr. J. Swan.*—I got no other fish but those the fishermen were in the habit of taking in the ordinary way.

1643. We never caught any fish for the market in the trawl.

1644. *By Chairman.*—I attribute my failure to the amount of weed, &c. in the bays in which I trawled.

1645. *By Mr. J. Swan.*—I don't think there is any other marketable fish here but the flounder, sole, skate, ling, and large cod which would be taken in the trawl.

1646. *By Mr. Allport.*—I have caught flounders and soles in from 40 to 50 fathoms in the German Ocean, in a place known as the Silver Pit, where the soles seek shelter from the shallow water during the winter.

1647. It is my firm belief that the sole is here in these waters.

1648. *By Mr. Johnston.*—I have never seen the English sole here, but the habits of the sole are such that they might be found in deep water as those in the German Ocean.

1649. The flounder I think would follow the same habit.

1650. *By Mr. J. Swan.*—I believe this to be the general habit of all flat fish. I have not heard of their being taken in deep water here.

1651. *By Mr. Allport.*—I believe them to be in deep water because of my experience of similar fish in other places.

1652. I have never worked drift nets, but have seen them worked.

1653. *By Mr. Johnston.*—I have had no reason to suppose that there are any fish here which would make it worth while to use the drift-net; but there are many fish here which would be very destructive to drift-nets,—sharks, dog-fish, barracouta, &c.

1654. You could catch horse-mackerel in such nets, but if any quantity were taken they would only be useful as manure.

1655. I don't think the population is large enough to consume sprats if caught here in abundance; they could be caught here if required.

1656. The net used for sprat catching is called a sprat net. It is set in the current with a beam like a trawl.

1657. *By Chairman.*—It requires a current to keep the mouth of the net open.

1658. I don't think there is any net which could be used to catch the sprats and small fish in deep water.

1659. *By Mr. Johnston.*—The sardines are caught by a similar net, but longer and deeper than the seine used here.

1660. Some of them would be a quarter of a mile in length.

1661. Large quantities of bait—roes of other fish—are used to bait the ground.

1662. The deep-sea trumpeter might be caught in water of from 60 to 70 fathoms with deep-sea lines.

1663. These deep-sea lines catch fish in the German Ocean, such as cod, ling, haddock, and skate.

1664. These fish are some of them dead when hauled up; three quarters of the fish so caught would be dead.

1665. There are in the fishing boats proper means for the preservation of the fish.

1666. The fish here would be killed by the use of deep-sea lines, and it would be useless to use such lines without means for the preservation of the fish.

1667. *By Mr. J. Swan.*—I do not think the use of the long line on our reefs would be desirable.

1668. The trumpeter of from 8 to 16 lbs. in weight fight very much when caught.

1669. I have caught perch, and used heavy sinkers. These fish did not fight when hooked.
1670. I have caught large sized perch on the West Coast; they did not fight like the trumpeter.
1671. Trumpeter offer great resistance when hooked. In their locality I find sharp-toothed sharks.
1672. If the trumpeter were lying dead on the line they would be eaten by sharks.
1673. The presence here of sharks is the reason why the deep-sea line could not be used.
1674. *By Chairman.*—The long lines I speak of are from 2 to 10 miles in length, with a hook every 8 feet.
1675. The deep-sea vessels run out the length of line,—then go back to the commencement and begin to haul it in again. The line is buoyed and flagged at every piece; a piece is about 6 fathoms.
1676. *By Mr. Johnston.*—There are smaller lines used on the sand banks, with 300 to 600 hooks. Haddock, small cod, flukes, and halibut are taken with them.
1677. I have never known such lines to be used here.
1678. In the shallow banks along our coast small lines might be tried, but the sharks being everywhere present would render its success questionable.
1679. The hand-line used here is therefore better than the long line.
1680. *By Chairman.*—I should not like to see all small crayfish brought to market. A fish of from 9 to 10 inches should not be brought up.
1681. I have seen them brought to town of small size, and not being saleable they were thrown over-board.
1682. *By Mr. J. Swan.*—From my experience as an English fisherman, and my experience here, I am not aware of any new kind of fishing appliances which would be worthy of adoption in these waters.
1683. I don't think an open boat safer than those now in use could be got. An open boat is necessary for the fishing practiced here.

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MR. GEORGE PEACOCK *examined.*

1684. *By Chairman.*—My name is George Peacock. I am a Jam Manufacturer, residing in Hobart.
1685. I have had a little experience in fish preservation. I was not very successful.
1686. It is about ten years since I made the experiment.
1687. I tried tinning all the available descriptions of fish.
1688. I was to some extent successful in preserving the fish.
1689. *By Mr. Johnston.*—It was my first experience. I had not, I think, proper appliances, and that, I think, caused the failure.
1690. I preserved two or three hundred dozen tins. I speak from memory.
1691. A good deal of the fish did not keep.
1692. Fish are not always available at a paying price for preserving.
1693. I don't think our fish preserved could or would compete with salmon. It would be a new kind of fish and have to make a market for itself.
1694. I think a preserving industry could be established in Hobart, which is very favorably situated for such an industry owing to its nearness to the sea and fishing-grounds.
1695. *By Mr. J. Swan.*—I tried king-fish. I don't think they preserved as well as trumpeter. I think trumpeter is the best fish for tinning.
1696. *By Mr. Johnston.*—If anchovies and sprats were captured, I should say they would be a valuable addition to any preserving enterprise which might be established here.
1697. Such an industry requires skilled labor—persons who are masters of details.
1698. If there were persons here with skill of details it might be established on a small scale, and afterwards enlarged.
1699. *By Chairman.*—King-fish at 3s. a dozen would pay well to preserve.
1700. *By Mr. J. Swan.*—I don't think I tinned 50 dozen—the fish were difficult to obtain.
1701. I sent my preserved fish to several of the Colonies.
1702. I got a satisfactory return everywhere I sent them, but some did not keep.
1703. I attribute my failure to the want of proper appliances.
1704. I was able to sell the fish in other markets at a price that paid.
1705. I had not the conveniences to carry fish-preserving on properly.
1706. I don't consider that I gave the experiment a fair trial.
1707. I produce a tin of preserved trumpeter containing about 1 lb. of fish. It could not be produced under 1s. a tin.
1708. Trumpeter are too expensive to tin. You could not get it under 8d. a lb. It would be too expensive a fish to put in this way.
1709. I tried salmon, barracouta, king-fish, and mackerel.
1710. *By Mr. Johnston.*—I think that barracouta properly smoked would find a constant market.

1711. I am not particular as to the sawdust used in fish-smoking, but I believe some sawdust is better than other.

1712. I have made no experiments. I have been told by the fishermen that cedar sawdust is the best.

1713. I have been using hardwood sawdust.

1714. *By Mr. J. Swan.*—A Mr. Ikin, I believe, tried fish-preserving, but I do not know with what success.

1715. *By Chairman.*—I tried tinning crayfish, but was not successful.

1716. I think they would easily preserve with proper appliances.

1717. *By Mr. Johnston.*—Persons of experience in fish-tinning could easily preserve crayfish.

1718. I think they would compete with English lobster.

1719. *By Mr. J. Swan.*—I don't think that the time has arrived to open up a preserving industry in a large way, but to commence in a small way I think there is an opening here.

#### THURSDAY, 6TH JULY, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, John Swan, Esq., A. G. Webster, Esq., A. Riddoch, Esq., and R. M. Johnston, Esq.

#### MR. JOHN SWAN *further examined.*

1720. *By Mr. Johnston.*—I have had experience of marine fishing, as well as fresh-water fishing.

1721. I have been in the habit occasionally of going with the professional fishermen as far as Port Arthur and down the Bruni shore.

1722. My experience extends to the use of the seine and graball nets, and line fishing.

1723. The principal fishes which ascend the rivers in large numbers are mullet, native salmon, flounder, sole, bastard trumpeter, flathead, perch, rock-cod, trevally; these all go up nearly to the junction of the fresh and salt water. Bream enter the freshwater creeks; gar-fish and whiting do not ascend so high as the others.

1724. I believe the fish which come up the rivers to spawn are flounder, mullet, whiting, and flathead.

1725. I have known rock-cod in large numbers, full of roe, to come into the Derwent; but I am not sure whether they came to spawn or in pursuit of food.

1726. I have seen large numbers of diminutive perch, rock-cod, trevally (2 kinds), bastard trumpeter in the upper waters of the Derwent.

1727. The River Derwent has been netted under my supervision since the establishment of a close time; and I have seen the seine drawn from Cleburne's Bay to Howrah, at different spots between such limits. In every place we found the introduced migratory salmonoids and fish of most of the kinds I have before named.

1728. At this time I was engaged by authority in obtaining specimens of salmonoids for the Sydney and Melbourne Exhibitions and for scientific purposes.

1729. This was during the summer months.

1730. It was in this way I obtained much information as to the young fry named.

1731. The fry of the fish I have named are in these waters in large numbers.

1732. It is necessary, in my opinion, that such shallow grounds of estuaries should be open to these young fish for their shelter, food, and protection. It is a provision of nature that they should seek these waters for such purposes.

1733. Seining was formerly principally carried on for the capture of flounders and mullet.

1734. In seeking these fish, small fry of the fish mentioned—flounders, &c.—are destroyed.

1735. I am aware that on the Victorian and New South Wales coasts such waters are preserved from the net fishermen for the protection of the small fry.

1736. In those waters there are no introduced fishes, and therefore there can be no other object than that stated for the closing of such waters.

1737. The protection of such waters in other places is therefore considered of great importance.

1738. Apart therefore from the protection of salmonoids, it is absolutely necessary in the interests of the permanent marine fisheries of Tasmania that the upper waters of estuaries should be preserved.

1739. The advantage of the closing of the River Derwent has been incalculable for other purposes than those originally contemplated.

1740. I am under the impression that more fish are taken now by angling, in the preserved waters of the Derwent, than were formerly captured by nets immediately before such closing.

1741. I believe that the stock had got so low by indiscriminate netting that the fish were not there to be caught. I arrive at this opinion chiefly from my own observation and partly from information from reliable observers.

1742. I have knowledge of the general opinion of the deep-sea fishermen as to the closing of the Derwent.

1743. I think that the more intelligent of them are well aware that these waters are nursery grounds for some of the fish which they capture in a mature state.

1744. As far as I know, they think that in their interests it is a good thing that the river is closed.  
 1745. The paper-fish caught in these waters develop into the silver bastard.  
 1746. I think the red and silver bastard are different stages of the same fish.  
 1747. The seine net destroyed large numbers of the young bastard trumpeter of very small size.  
 1748. The destruction of these fish, prior to the closing of the river, must therefore have been very great, owing to the extent of seining then carried on.  
 1749. The closing of the Derwent against seining does not at all interfere with any other than the seine fishermen, or in a very small degree with the graball fisherman. The hook and line fishermen are not in any way injuriously affected.

MONDAY, 10TH JULY, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, J. Swan, Esq., R. M. Johnston, Esq., A. G. Webster, Esq., R. F. Irvine, Esq., H. Weedon, Esq.

MR. HENRY MILNER, *examined*.

1750. *By Chairman*.—My name is Henry Milner. I am now a fish hawk, residing in Launceston, but was a fisherman for 30 years.  
 1751. I fished in the Tamar from Low Heads to Launceston.  
 1752. I fished with nets and hand-lines.  
 1753. I used a seine  $37\frac{1}{2}$  fathoms long, 9 feet deep, 1-inch mesh from knot to knot. A garfish net about the same length, but  $\frac{1}{2}$ -inch mesh. A graball net about the same length, 15 feet deep,  $1\frac{1}{2}$ -inch mesh.  
 1754. With the seine I caught mullet, sea-trout, flathead, flounders, soles occasionally, bream, (which are not so plentiful now as formerly), pike occasionally, blue heads, parrot-fish, and gurnet.  
 1755. I have caught pike as far up as Pig Island.  
 1756. *By Mr. J. Swan*.—I caught sand-mullet about 15 miles from Launceston; about Gravelly Beach is the principal place where they are found.  
 1757. *By Chairman*.—Mullet and flounders are the chief market fish for Launceston.  
 1758. *By Mr. Johnston*.—They are what we call river fish.  
 1759. *By Mr. J. Swan*.—Bastard trumpeter are taken in the graball.  
 1760. *By Mr. Johnston*.—The bastard trumpeter is called "trevally" in Launceston.  
 1761. The chief place for them is in kelp beds near Heads, 6 feet to 16 feet of water. I have not fished for them in deeper water than that.  
 1762. I have taken them 5 lbs. weight.  
 1763. The same colour seems to prevail on the same ground.  
 1764. I have opened odd specimens.  
 1765. I have seen roe and milt in the large fish, but not in the small. We got the largest from Middle Island to the Heads, the deepest water in which we fished.  
 1766. We seldom got other fish with them on account of the size of mesh. We fished for them alone.  
 1767. We fished for them all the winter.  
 1768. We sometimes, on rare occasions, got a perch with them.  
 1769. There has been a carp got in the River Tamar. It is a rare fish here. I did not get it.  
 1770. I have never seen the real bastard trumpeter taken here.  
 1771. *By Mr. J. Swan*.—I know the silver-bellied bastard trumpeter, but have never got it here.  
 1772. *By Mr. Johnston*.—The ground for trumpeter is kelp bottom.  
 1773. I know the schnapper. I never saw one in the Tamar. I have heard of their being got outside the Heads, but not by the regular fishermen.  
 1774. Our boats are not fit to go outside the Heads. They are square-sterned.  
 1775. Port Sorell is only 15 miles from the Heads, and we have to watch the weather to go there.  
 1776. *By Mr. J. Swan*.—The fishing ground at Port Sorell is in shallow bays with the river running into it.  
 1777. We got there flounders, mullet, ling, bream, salmon trout (native), garfish, flathead, rock-cod, pike,—no other market fish.  
 1778. It is a good fishing ground,—better takes there than in the Tamar.  
 1779. I have fished Green's Creek for bream and flounders.  
 1780. It is about 7 years since I was there.  
 1781. Deep lines have been tried outside the Heads for rock-cod and flathead, with good success.  
 1782. The depth was from 10 to 20 fathoms.  
 1783. I have not known the perch to be got there.  
 1784. I have not known king-fish to be got about the Tamar—only barracouta.

1785. I have no personal experience of deep-sea fishing.
1786. I recollect a Hobart boat coming here—it was for seine-fishing.
1787. *By Mr. Johnston.*—The deepest water is 20 fathoms; we could not fish in deeper water with our appliances.
1788. *By Mr. J. Swan.*—I have no knowledge of fish except those I have mentioned.
1789. *By Mr. Johnston.*—I have never caught real trumpeter.
1790. *By Mr. J. Swan.*—We got yellow-tail occasionally outside the Heads.
1791. *By Mr. Johnston.*—We got silver-fish from Christmas to the fall of the year.
1792. I have at one trip taken 100 dozen in the seine in from eight to ten feet of water.
1793. We got them from one end of the river to the other.
1794. I have got them from Gravelly Beach to the Heads.
1795. They are migratory, and come in from the sea to spawn.
1796. Their spawning-ground must be where they resort in this river.
1797. They are much esteemed in the market, weigh  $\frac{1}{2}$  lb. to 1 lb., eight inches long.
1798. I have sold them from 1s. to 2s. a dozen.
1799. When they do come in they are plentiful.
1800. Any kind of fish is scarce this year.
1801. I do not know a crustacean here called "brit."
1802. We got the winter-bream or snotgall in numbers occasionally.
1803. Sometimes they come in in large numbers, but this year are very scarce.
1804. They are about the same size as silver-fish.
1805. I have never got them outside the Heads.
1806. I am not aware that the silver-fish grows to a great size in the south.
1807. *By Mr. J. Swan.*—I have had big snotgalls from Hobart, but they do not grow to that size here.
1808. *By Mr. Johnston.*—The mullet and flounder are most esteemed here. These are the fish most relied upon for the market.
1809. We always get a market for them. The demand is at times greater than the supply.
1810. I don't think we could extend the supply.
1811. *By Mr. Weedon.*—There are at times a great number of small mullet brought into the market.
1812. *By Mr. J. Swan.*—Flounders are brought to market every day—about 20 dozen a day.
1813. This goes on all the year.
1814. They bring 3s. to 4s. a dozen.
1815. The hawkers get 6d. a piece for them; very seldom get 9d.
1816. The average price is about 6d.
1817. The lowest price is 2s. 6d. a dozen. These are supposed to be fish 9 inches long.
1818. Sometimes 8 or 10 dozen a day are sold below the regulation size.
1819. A great many are caught, but the fishermen dare not bring them up,—they are turned back into the river.
1820. In the summer time nine out of every dozen die although thrown back into the water.
1821. A fair night's work of marketable fish would be 5 to 6 dozen. I have got 30 to 40 dozen.
1822. With these I would take 100 dozen not fit for the market.
1823. The most of the small fish are taken from Pig Island Flat to Gravelly Beach.
1824. That is the principal breeding-place.
1825. *By Mr. Johnston.*—There are a good many snags there, at Nelson's Shoals, but we manage to draw the seine.
1826. *By Mr. J. Swan.*—I think flounders should always be fished for.
1827. The flounders are now in full roe. I have had them full roed this month, and next month none in them.
1828. If there was a season it should be this and next month.
1829. I know that they carry their roe a long time, but this is about the time that they shed them.
1830. I don't think the supply of flounders would be increased by protecting them, they are so numerous.
1831. I don't think that mullet need protection, for the same reason as I have given as to flounders.
1832. *By Mr. Webster.*—The mullet are taken all over the river all the way down.
1833. Garfish from Swan Point downward. Large fish are very scarce. There are plenty of garfish in the river, but they are so small.
1834. We fish for them all the year.
1835. If we used a net of larger mesh for catching flounders other fish could not be got.

1836. *By Mr. Johnston.*—It is not necessary to have a small-meshed net to catch flounders.
1837. *By Mr. Webster.*—It is not the mesh of net that kills the flounder, but the blubber which is drawn with it.
1838. *By Mr. Johnston.*—An inch mesh is necessary to catch mullet.
1839. I don't think we lose the big mullet by using the small-meshed net.
1840. *By Chairman.*—The flounders are now more plentiful than formerly.
1841. They were scarce 28 years ago.
1842. They go into deep water after spawning.
1843. We get a few fry of fish when seining, but most escape through the net.
1844. *By Mr. Webster.*—Mullet have become scarce.
1845. There are about the same number of boats engaged now as formerly,—15 boats, 2 men each.
1846. *By Mr. Johnston.*—There are from 15 to 20 fish hawkers.
1847. The length of the boats is about 18 feet, square-sterned, half-decked,—odd boats with wells.
1848. My experience also extends to shrimping.
1849. A dry season is an early season. I then go, about Christmas, for bait for local fishing; a month afterwards, shrimping.
1850. We get them first about eight miles down the river.
1851. A small-meshed net is used, with beam about 8 feet long, the radius of the bow about 2 feet 6 inches,—a sort of open purse-net.
1852. We fish then as close in to shore as we can get.
1853. In such cases I go by myself every night, weather permitting.
1854. My highest take last season was 100 quarts, the lowest one quart; average, 20 to 30 quarts.
1855. Average price, 6d. per quart.
1856. When the shrimps are plentiful, more men shrimp than when they are scarce.
1857. I have known three to five men, at the best; when scarce, only one or two.
1858. We have a good demand if the shrimps are abundant—all for local consumption.
1859. For the last seven years we have not sent any to Victoria—there was not sufficient supply.
1860. *By Chairman.*—They were more abundant formerly than now. I don't think they come in now.
1861. We do not sort them, but take them as they come up.
1862. *By Mr. Irvine.*—I do not fish at Swan Point; it is too hard work on account of the grass.
1863. *By Mr. J. Swan.*—We get whitebait in the shrimp-net, the polwin (goby), jolly-tail, the silver-belly.
1864. The anchovy, the open-mouth (something like a mullet.)
1865. *By Mr. Johnston.*—The season for shrimping depends upon the brackish water. I do not know whether they come up to spawn.
1866. They go up the South Esk sometimes.
1867. We think the steamers prevent their going there regularly.
1868. The season lasts four or five months.
1869. *By Mr. Johnston.*—The consumption would increase with the supply.
1870. They are not got at Port Sorell.
1871. *By Mr. Webster.*—Crayfish have been got at Circular Head, but not nearer Launceston than that.
1872. *By Mr. J. Swan.*—I don't think there are now any oysters in the Tamar.
1873. I have taken thousands twenty years ago.
1874. They disappeared about twenty years ago.
1875. *By Chairman.*—The principal beds were from north of Whirlpool Reach to the Heads.
1876. *By Mr. J. Swan.*—They disappeared all at once, and have not been found since.
1877. The common mussel are not in the Tamar; they were never very numerous, and now there are none.
1878. *By Mr. Irvine.*—I think something in the water killed the oysters; some fishermen think the trail ate them,—the trail is something like a wood-louse.
1879. *By Chairman.*—I have got 1000 dozen a day—mud oysters—two men dredging. They were all consumed locally.
1880. At that time there were five or six boats engaged in oyster dredging.
1881. The average for each boat per day would be 150 dozen throughout the season.
1882. *By Mr. J. Swan.*—I don't think that the town being larger and sewage greater has anything to do with the scarcity of some fish.
1883. *By Mr. Webster.*—We get odd conger eels in the Tamar.



1884. *By Chairman.*—We buy all the fish from the boats; there is no fish market or regulations here.

1885. *By Mr. Webster.*—Small flounders have been taken from us by the constables. None have been taken for the last four months.

1886. *By Chairman.*—None of the police regularly attend at the boats.

1887. I cannot offer any suggestions in the interests of fishermen or fisheries.

1888. *By Mr. Johnston.*—The flounders are so abundant that no amount of destruction can affect them injuriously. The presence of the fish in larger numbers than formerly proves that the mode of fishing is not injurious.

1889. I don't think the young of any deep-sea fish come up the Tamar in large numbers.

MR. EDWARD LEWIS DITCHAM, *Merchant, examined.*

1890. *By Mr. Johnston.*—I have had some experience in trawling.

1891. My first experience was gained off Plymouth, in England. I went out for pleasure with the professional fishermen, and also with men experienced in trawling connected with Trinity Board, of which my father was Superintendent.

1892. The trawl used had a beam of 16 to 18 feet, suitable to the size of the yacht, which was of 5 tons, and shoes weighing 50 to 60 lbs.

1893. The trawlers at Plymouth go out about 5 miles from Plymouth Sound, in water of from 12 to 20 fathoms.

1894. The bottom for trawling must be free from rocks or kelp.

1895. The principal fish we got were hake, turbot, a few soles, ling, and an occasional John Dorey.

1896. I used to get John Dorey in Plymouth Sound in from 5 to 10 fathoms. There was very little current.

1897. I imported a trawl net from England precisely similar to that used in my father's yacht.

1898. I expected to get with it soles.

1899. These fish being washed up on the north coast led me to believe that there was a bank, and I still believe that there is one off the coast.

1900. The first attempt I made was in Port Sorell Bight. I tested the bottom 17 fathoms off Badger Head. I got on to a coral reef, which brought me up.

1901. I reached in and in from 6 to 7 fathoms on a sandy bottom. I dropped the net and trawled round to Port Sorell Point, where I drew up the net. There were only a few skates in it. It had been down about 4 hours.

1902. I then went to the bight between Wright's Island and Port Sorell Point, when I again cast the net and trawled round the bight on a clean sandy bottom about 5 to 7 fathoms. The result was just the same as on the previous cast.

1903. The skate seemed to be the prevailing fish there.

1904. A relative of mine who had experience told me that the bottom was too clean, there being no food on it for fish.

1905. I then lent the net to the captain of a 40-ton vessel of mine. He went clear of Tamar Heads and trawled till he got abreast of the Mersey, generally in about 15 fathoms of water. He got no other description of fish than those obtained by myself.

1906. I again went out and reached from Tamar Heads about 10 miles, then cast the trawl.

1907. It was reported that a bank existed near Tamar Heads. I sailed in the direction of such reported bank but did not pick it up.

1908. I trawled for about 5 hours. The night was very dirty, and I brought the trawl up. On this occasion I had a suitable bottom—feeding-ground for fish—but I did not catch any.

1909. I am of opinion that there is a bank about there with soles on it. I might have been within a yard of it without being aware of its presence.

1910. Off Plymouth, banks are missed, and then no fish are taken.

1911. My experiments were made in the spring, about October.

1912. The captain's trial was in the summer.

1913. *By Mr. Webster.*—It has not been ascertained positively that there are any banks in Bass's Straits.

1914. I spent about £60, and was not satisfied.

1915. I would like to see a trawl tried from the Tasmanian to the Victorian coast.

1916. The bottom is very even all the way, and not too deep for trawling.

MR. WILLIAM HARRISON *examined.*

1917. *By Chairman.*—My name is William Harrison. I am a resident of Launceston.
1918. I have fished in the North and South Esk, St. Patrick's, and the Meander fresh-water rivers, for herring, English trout, and blackfish.
1919. The herring is very much more scarce than formerly.
1920. This is owing to an epidemic which appeared in the rivers of the Colony about 14 years ago.
1921. Before the epidemic, I usually began the season's fishing on the 1st September in the South Esk. The fish were in best condition in September and October.
1922. We then worked up the river as the season advanced.
1923. They spawn in the North Esk the latter end of March, but in the South Esk not until May.
1924. They spawn in the fresh water. They make the redd and deposit spawn like the salmon.
1925. *By Mr. Johnston.*—They go up the rivers to spawn.
1926. *By Mr. J. Swan.*—They go up or come down rivers to suitable spawning places.
1927. *By Mr. Johnston.*—I have never caught them in the brackish water.
1928. *By Chairman.*—The gravel in which the fish spawned was very fine, almost like sand.
1929. *By Mr. Johnston.*—The largest herring I have seen was  $\frac{3}{4}$  lbs. weight, caught in the South Esk, not very long—a chubby fish, about 10 to 12 inches.
1930. The largest I have caught was about 8 ounces.
1931. The average weight 6 to 7 ounces, 7 to 8 inches long.
1932. They are still decreasing in numbers. The trout destroy the fry. I have seen the trout chasing them.
1933. The epidemic occurred before the trout were introduced.
1934. Before the epidemic my largest take of herring was 15 dozen. Latterly, the largest was 2 or 3 dozen.
1935. *By Mr. Weedon.*—My experience does not extend to the Mersey.
1936. *By Mr. J. Swan.*—That is the only river which appears to have recovered.
1937. I should think a river in which 6 or 8 dozen a day could be taken had recovered itself.
1938. I fished the Mersey the year before last. I knew two men who got 60 dozen there in one day.
1939. The trout are not numerous in the Mersey, and the herring have completely recovered themselves in that river.
1940. At the time of the epidemic I saw two herring with bright red heads.
1941. I supposed there was a disease, but I was told that they were seen going down the river in large bodies, all dead.
1942. *By Mr. Johnston.*—I know the blackfish.
1943. In my early experience I fished for them in the North Esk.
1944. At that time they existed in the South Esk, as far as the Falls of the Second Basin, but not beyond there,—the Falls obstructed them.
1945. I am certain that they had never been in these upper waters.
1946. In the North Esk they are taken from 3 ounces to 4 lbs. in weight.
1947. The big fish are taken in the commencement of the season—August.
1948. The big fish appear to pair in that month.
1949. When you get one big fish you always get another—male and female; the female has a smaller head than the male.
1950. *By Chairman.*—No blackfish has ever been got with a milt.
1951. *By Mr. J. Swan.*—I have seen roe in large fish, loosely attached, nearly the size of a trout ova.
1952. *By Chairman.*—In the spawning time you get a fish full of spawn and another without any. From the different appearance of the two fish I am certain there are male and female blackfish.
1953. *By Mr. Johnston.*—As an article of food it is a most delicate fish; it is in best condition August and September.
1954. They get full of spawn in November and shed them in December.
1955. They pick up again in February and March.
1956. A very large number of persons fish in the North and South Esk.
1957. In former times half a dozen fish, of from 1 to 2 lbs. were got in an evening, but now you may go out a dozen times and not get a lb. fish.
1958. Since the brown trout has been introduced they have become scarcer. I attribute the scarcity to overfishing and the brown trout.
1959. I stocked the South Esk with blackfish by capturing small fish, placing them in a tin billy, and transferring them to other parts of the river.
1960. Mr. William Newman and myself took up 21 to the Third Basin in 1859, above the Falls. I also put a pair of large fish, of 1 lb. each, below.

1961. I sent thirteen to Mr. Russell, of Perth; he placed them in the South Esk at Native Point.
1962. The result was that three years afterwards I got several of 1 lb. weight in the Third Basin.
1963. The South Esk and its tributaries are now stocked beyond Snake Banks.
1964. Obstructions such as falls prevent the progress of this fish.
1965. Practically the South Esk is stocked as far as Stony Creek, and might be stocked higher up if the fish were caught and introduced.
1966. *By Chairman.*—I would recommend a close season for blackfish,—there should be three months, 1 November to 1 February.
1967. *By Mr. J. Swan.*—I cannot say how this could be carried out. If any practical means could be devised the fish ought to be protected,—as also the herring.
1968. *By Chairman.*—I have had experience in fishing for the English trout.
1969. They are decreasing in all the rivers here.
1970. I think this is owing to the increase of cormorants, which destroy the fish, and the platypus, which destroys the spawn.
1971. *By Mr. Johnston.*—There are fellmongering establishments on the South Esk, which I think do no harm.
1972. *By Chairman.*—Shot and dynamite have been known to be used for the capture of trout.
1973. The law for their protection is not properly carried out.
1974. The licences are not looked after. Night-lines are set along the rivers; gratings are not placed before mill-races or artificial streams.
1975. If the police would look after matters more the Act might be better carried out.
1976. The native trout are to be found principally in rivulets.
1977. *By Mr. Johnston.*—The brown trout is in the Meander, South Esk, and North Esk.
1978. The South Esk fish is far superior to the North Esk fish; I think this is owing to the food.
1979. The Meander fish are fine fish.
1980. *By Mr. J. Swan.*—I have seen two kinds of fish in the North Esk; one very silvery, with white flesh.
1981. The South Esk fish is better for the table than that found in the North Esk.
1982. The fish in the South Esk is a light brown fish with red spots. I attribute the quality to the food.
1983. The South Esk is full of shrimps, the North Esk has none.
1984. This applies to the upper or fresh water, not to the brackish water.
1985. In the tidal waters of the North and South Esk the fish are very good, of silvery appearance, and large size.

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TUESDAY, 11TH JULY, 1882.

*Present*—Matthew Seal, Esq., (*Chairman*), A. G. Webster, Esq., R. M. Johnston, Esq., J. Swan, Esq., H. Weedon, Esq., R. F. Irvine, Esq.

MR. HUGH FRASER *examined*.

1986. *By Mr. Johnston.*—My name is Hugh Fraser. I am a resident of Launceston.
1987. I have had 10 years' experience in fishing in the northern parts of the Island and Bass's Straits.
1988. I had a craft trading on the coast, and fished for pleasure with graball net and hand-line.
1989. The graball was 23 to 26 yards long, 24 meshes deep, 2-inch gauge.
1990. The deepest water in which I used it was  $3\frac{1}{2}$  fathoms.
1991. The principal estuary fish were bream (silver and black), trevally, bastard trumpeter (red, silver-belly, and bronze), perch (silver and black), magpie perch, flounders, soles, gurnet (3 kinds), rock-cod,—the largest I think 7 lbs., average about 5 lbs., mullet, native salmon-trout, snotgall (small), green-bone (caught at George Town), garfish, flathead, pike, anchovies (which we call sprats), and another small fish like a rock-cod.
1992. In the open coast waters, salt-water blackfish, kelp-fish, barracouta, kingfish, (towards Swan Island), yellow-tail, mackerel (horse), native salmon (shoals), large bastard trumpeter, schnapper, 5 miles off the heads.
1993. I have heard of real trumpeter at Waterhouse Island in deep water, but have not seen any myself.
1994. Migratory fish, moving in shoals, would be horse mackerel, mullet, and salmon trout. Season would be the end of summer; large shoals.
1995. I have seen in autumn, at Port Sorell, cart loads of small fish washed up, which I think were pilchards.
1996. Magpie perch may be got at Preservation Island.
1997. *By Mr. J. Swan.*—The water is not so troubled there, although there is a tide.

1998. I have caught perch at Rum Island.
1999. *By the Chairman.*—I should think they could be got in quantities if fished for.
2000. *By Mr. J. Swan.*—I never heard of a magpie perch taking a bait. They are a weed fish.
2001. *By Mr. Johnston.*—Round the Hunter Islands you can get plenty of flathead, rock-cod, and the gurnet.
2002. The other important market fish to be got are gurnet, all round the coast, in water of from 8 to 16 fathoms.
2003. Flathead all round the coast in any water.
2004. Rock-cod all round the coast.
2005. Mullet and salmon all round the coast, and in every river in autumn.
2006. Flounders on sandy beaches anywhere from the heads westward, and on beaches open to the straits.
2007. Barracouta from June to February out in open water along the coast in abundance, caught by jig.
2008. Kingfish in the Straits towards Swan Island.
2009. *By Chairman.*—About midsummer I saw them in abundance at Flinders' Island, about 600 in a small pool at Boat Harbour.
2010. *By Mr. Johnston.*—It was at the time the *George Marshall* was wrecked.
2011. Yellow-tail: I don't know when they first appear. They are taken by spear,—enticed by a jig to make a ripple, and then speared.
2012. Garfish can be got in abundance about the autumn in the Northern rivers, taken in nets by the fishermen.
2013. The best estuary fishing grounds on the North Coast which I know of are the Tamar, Port Sorell, the Leven, and the Piper.
2014. Large quantities of fish could be got from these places with proper appliances.
2015. Regular fishermen are at work in the Tamar.
2016. The general fishing is graball, in water of from 2 to 5 fathoms.
2017. The Tamar boats are not adapted for fishing outside the heads. A few have wells, but the fish could not be brought alive through the fresh water.
2018. The fish principally brought to town here are mullet, salmon trout (native), flathead, rock gurnet, rock-cod, flounders, silver-fish, in large numbers,—season about autumn; garfish, bream (not numerous).
2019. *By Mr. J. Swan.*—I have been down in the Straits. I was there for nearly 3 months.
2020. I have known the half-castes fish from the rocks.
2021. I have never seen them fish from a boat.
2022. I have known them to be hard up for food.
2023. They principally catch crayfish.
2024. *By Mr. Johnston.*—I believe the fish are there if looked for.
2025. *By Mr. J. Swan.*—I believe it is indolence on their part which prevents their taking fish systematically.
2026. *By Mr. Johnston.*—The fishermen fish in the river Tamar on the flats with the seine. This means of capture is largely employed. The net used is of one inch mesh for flounders, half-inch for garfish.
2027. There are small fish brought to market. I believe they let a large number of small fish go if alive.
2028. *By Mr. J. Swan.*—I have been out with the professional fishermen.
2029. We had a haul of 300 dozen of very small mullet and salmon trout in a few shots in 1861—market fish.
2030. *By Mr. Johnston.*—In hauling the seine I don't think a large number of small fry are destroyed.
2031. The young flounders are taken in large numbers, but the fishermen use them.
2032. *By Mr. J. Swan.*—Every flounder of 4 to 5 inches comes up. The market size is, I know, 9 inches. For every dozen market fish as many more under-sized are taken.
2033. I would not credit a statement that ten small flounders to one large one are taken.
2034. In drawing the seine on the flounder ground I don't think the difference in take would be more than two-thirds small to one-third large.
2035. Of the two-thirds small, if returned to water very few are killed; they don't mesh; there is nothing to injure them.
2036. Mud, weed, and jelly-fish come up with the net. If small fish are returned quickly to the water they are uninjured.
2037. The net is not always drawn to shore. A man goes on shore sometimes, then the fish are drawn to shore.
2038. I don't think the fishermen are careful in returning the fish to water.

2039. When the net is drawn to the boat all are tumbled in together, large and small.

2040. *By the Chairman.*—The flounders seem to be more plentiful this last year, more so than for the last 6 or 7 years.

2041. I can assign no reason for this.

2042. *By Mr. J. Swan.*—The Tamar cannot be netted in some parts where there are flounders, on account of snags.

2043. However much the river is fished there are breeding-places which cannot be disturbed.

2044. I think the present fishing can be continued without destroying the fishery.

2045. I know there is a time when the fish taste much of tar, but I do not know the cause of that.

2046. *By the Chairman.*—I have shrimped in the Tamar.

2047. They are not so plentiful as formerly.

2048. I think the scarcity is owing to too much under-current of fresh water.

2049. The decrease has continued for 5 or 6 seasons.

2050. All are taken—none riddled.

2051. The mesh of net is  $\frac{1}{2}$ -inch in the purse. This would not allow the small shrimps to escape.

MR. RICHARD FRANCIS IRVINE, of *Launceston*, examined.

2052. *By the Chairman.*—The first effort at acclimatisation on the Northern side was in 1869, by the late Charles Macarthur, with brown trout. He turned out 1190 fish in the North and South Esk, Macquarie, Rubicon, Meander, and Distillery Creek.

2053. After his death this subject was taken up by Messrs. Weedon, Harrison, and myself.

2054. It was said that in 1869 Dr. Clarke liberated 750 trout in Distillery Creek and the St. Patrick's River.

2055. In 1870 Mr. Harrison and myself turned out 300 salmon trout ova in the Third Basin, on the South Esk. A few were kept and hatched, and 185 mixed fry (salmon and brown trout) were liberated in the South Esk and Liffey.

2056. In 1871 the efforts made resulted in failure, owing to floods.

2057. In 1872 nothing was done.

2058. In 1873, 46 brown trout and 79 salmon trout fry were placed in the South Esk.

2059. In the same year Mr. Harrison and myself went to the Salmon Ponds and brought to Launceston 8000 brown trout and 300 salmon trout ova, losing about 25 during transit.

2060. We succeeded in hatching a number, and we liberated 2540 in the North and South Esk, Meander, Supply, Anderson's Creek, Barnard's Creek, Brumby's Creek, and 16 in the Mersey.

2061. In 1874 Messrs. Harrison and Porter went to the Ponds and brought up 5000 trout and 500 salmon trout ova.

2062. Of these, 2396 fry were liberated in the North and South Esk, Meander, Lake River, the Forth, the Brid, and the St. Patrick's.

2063. In 1875 we got fry from the Salmon Ponds, and liberated 420 in the Meander, Lake River, and South Esk.

2064. In 1876 we received 136 salmon trout, which were liberated in the South Esk.

2065. In 1877 we received 518 salmon trout ova, and hatched some, turning 208 fry into the South Esk.

2066. In 1879, 900 trout fry were obtained from the Salmon Ponds for Emu Bay, but only 27 reached there alive, and these were liberated in Romaine Creek.

2067. In 1880, 800 fry were obtained and liberated in the North and South Esk and Mersey.

2068. In the same year 500 were sent to Emu Bay, but only 23 survived.

2069. In 1881, 1500 fry were liberated in the North and South Esk, and 500 in the Ringarooma.

2070. The fishing last season was very bad in all the Northern rivers.

2071. In the St. Patrick's River the fish are decreasing rapidly. I am unable to assign a reason for this.

2072. The fish appear to be decreasing in number in all the Northern rivers except the South Esk.

MR. CHARLES W. ROCHER, *Town Clerk, Launceston*, examined.

2073. There is no fish market in Launceston.

2074. The fish are sold from the boats, and disposed of in the town by hawkers or at small shops.

2075. There are no market regulations relating to fish, and no special provision that I am aware of for the prevention of the sale of unwholesome fish.

2076. I am acquainted with the Flounder Act. Its provisions are not satisfactorily carried out here. Occasionally a constable seizes under-sized fish.

2077. There is no regular fish supply. Occasionally a boat arrives with fish, which are immediately disposed of.

THURSDAY, 27TH JULY, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, A. Riddoch, Esq., R. M. Johnston, Esq., A. G. Webster Esq., John Swan, Esq., Curzon Allport, Esq.

MR. JOHN HENRY DICKENSON, of *Bridgewater*, examined.

2078. *By Mr. C. Allport*.—I am a resident of South Bridgewater, and am an angler.

2079. I have had some experience in fishing for the imported salmonoids.

2080. I produce a list of fish (salmonoids) caught by myself at Bridgewater last season, from 2nd September to 1st May,—30 fish, weighing 107½ lbs.

2081. From my knowledge, I believe that nearly 300 fish were caught in this vicinity last season, weighing from 3 to 8 lbs. each.

2082. The bulk are sold,—the ruling price being 1s. per lb.

2083. The fish are most abundant during the first month in the season (September), but are seen about here before that. They are to be seen in considerable numbers now: the water is quite alive with them. I speak of the migratory fish.

2084. A large number were seen at the mouth of the River Jordan yesterday.

2085. The fish caught early in the season are in good condition. No spent fish, so far as I know, were taken last season, but one or two the season before.

2086. In winter there is always salt water here, though only slightly so at flood times.

2087. I regard the river here as a feeding-ground for the fish. The flats are full of shrimps and small crabs; and the presence of these is a reason why I think this is a feeding-ground.

2088. I think it a feeding-ground for the native fish also, such as mullet, mackerel, bream, rock-cod, flathead, native salmon, &c.

2089. The mullet have been particularly plentiful recently, and are so now.

2090. They have been most plentiful the last few years, more so than formerly.

2091. *By Chairman*.—I think this is owing to the river having been closed against netting.

2092. *By Mr. Swan*.—I mean the disuse, in the upper parts, of the seine nets.

2093. *By Mr. Allport*.—The fishing for the migratory salmonoids first commenced in September, 1879. I was the first to get a licence and catch a fish.

2094. My first catch was 7, weighing an average of 5 lbs.

2095. The numbers caught during season 1880-81 were altogether 220.

2096. In the season 1879-80 about 10 were taken.

2097. *By Mr. Johnston*.—I have taken some considerable trouble to ascertain these numbers.

2098. *By Mr. Allport*.—The number of fishermen has steadily increased.

2099. Some fish regularly for the purpose of profit.

2100. *By Mr. Johnston*.—Others would have taken as many if they had fished as I did.

2101. The majority of the fish caught were taken by a few individuals.

2102. *By Mr. Allport*.—Owing to the presence of the salmonoids, the place has improved, and the fish are looked forward to as bringing visitors and adding to the value of property.

2103. *By Mr. Webster*.—In addition to the number of fish I have stated as having been caught here, there may have been others taken which are not known to me.

2104. *By Mr. Allport*.—The number of fish taken would have been far larger but for the fishing being stopped by the drift weed from the flats.

2105. This was a very great drawback to last season.

2106. In September and April of this last season the fishing was very much affected by floods.

2107. The fish are first seen about the beginning of August: they seem to be working up.

2108. I have not noticed whether they were following food.

2109. *By Chairman*.—I did not see any fish last season which were scarred.

2110. *By Mr. Allport*.—The fish continue here during the season. We catch more in the first and last months than in any other part of the season.

2111. I think there is more food in the middle of the season, and the fish cannot then be caught.

2112. Just before the beginning and the close of the season the fish are in best condition.

2113. *By Chairman*.—There is no shrimp-fishing here, but there are great quantities seen.

2114. *By Mr. Johnston*.—Shrimp-fishing has never been attempted.

2115. *By Chairman*.—I think the young of native fish are plentiful here, and come for protection.

2116. I do not know where the mullet spawn. I caught some on Good Friday full of ova.
2117. *By Mr. Allport.*—I do not think any poaching is practised here. I think the seasons are observed.
2118. *By Mr. Swan.*—I have caught fish of different appearance, but of good condition,—one a bright fish, the other a dull-coloured one. The bright fish are longer in proportion to their weight than the other.
2119. I have caught, near the bridge, short fish of very great weight in proportion to their length.
2120. *By Mr. Allport.*—The heaviest fish caught here last season was 12 lbs. : it was a brown trout.
2121. I caught a bright fish of 8 lbs. in season 1880-1.
2122. *By Mr. Johnston.*—The greater number caught are the bright fish,—the migratory.
2123. *By Mr. Allport.*—I refer in my evidence to the immediate neighbourhood of Bridgewater.
2124. I have seen much larger fish than have been caught, but they keep mid-stream, about the middle of the season.

MR. WILLIAM HENRY THOMPSON *examined.*

2125. *By Mr. Allport.*—I am Clerk at the *Monarch* stores, Bridgewater.
2126. I have been living at Bridgewater over two years, and have fished for salmonoids.
2127. I caught forty-five in season 1880-81, and eighteen in season 1881-2 to my own rod.
2128. I did not fish so much last season. The weeds and flood interfered with the fishing during last season.
2129. The fish are most numerous about here during the first week in the season,—they are then travelling upwards.
2130. They slack off towards the middle, but about the close of the season they are again to be caught in greater numbers.
2131. I think that in the middle of the season the greater number have gone up the river.
2132. *By Mr. J. Swan.*—I think there are two runs of fish, an early one and a later one.
2133. *By Mr. Allport.*—During the early and late parts of the season the water is brackish here, but not in the middle of the season : it is then salt.
2134. In the season 1880-81 food was plentiful at the beginning, but last season it was not so early.
2135. Large fish have been seen here during the last week.
2136. The presence of the fish improves the value of Bridgewater by bringing visitors.
2137. It has added to the income of some people.
2138. The best-conditioned fish are taken in the early part of the season.
2139. I have not caught any spent fish.
2140. The largest fish I have taken weighed 8 lbs. : it was a migratory fish.
2141. Larger fish than have been caught have been seen about here.
2142. I believe if fishing were permitted a little earlier than now it would be better. Larger fish might be taken if the season were longer.
2143. I believe the fish feed here. I think some linger here all the year.
2144. *By Mr. Johnston.*—Those which remain are deep and short, a little silvery, marked like the brown trout.
2145. *By Mr. J. Swan.*—A very heavy fish for its length.
2146. *By Mr. Johnston.*—They would average about 5 lbs. each.
2147. *By Mr. Allport.*—I think there are two sorts, the bright fish and the dull-coloured.
2148. Nearly all are caught with the phantom.
2149. *By Mr. Johnston.*—Notwithstanding the decrease in my own catch last season, I think the fish are increasing here.
2150. *By Mr. Allport.*—The fish are taken off the *Monarch* pier, the bridge, between the bridges, and off the edges of the flats. Large fish are taken in the scour along the upper side of the causeway.

MR. JOHN COOLEY *examined.*

2151. *By Mr. Allport.*—I am the proprietor of the *York Hotel*, South Bridgewater.
2152. I have been living here 16 months.
2153. Before I came here I had some experience in fishing in the Derwent.
2154. There are more fish in the river than there used to be,—about here they are at present very plentiful.
2155. This is owing, I think, to the river having been closed against netting.
2156. I kept a record from September to 15th November last of salmonoids taken here—144 fish, weighing 594 lbs., caught within two miles each way of the Causeway.

2157. *By Mr. Johnston.*—I gave up the record because I found that it was not complete.
2158. The fishing has proved of great advantage to Bridgewater. I have found it so.
2159. Visitors from all parts come here to fish.
2160. *By Chairman.*—The value of the fish is 1s. per lb.
2161. *By Mr. Johnston.*—Taking them all round the average weight would be 4 lbs.
2162. *By Mr. J. Swan.*—Some labouring men about here have made a little money by means of fishing for salmonoids. In 1880-81 a blacksmith here got between £10 and £12 by the sale of fish caught with his rod.
2163. *By Mr. Allport.*—I get orders for salmonoids and supply them to Launceston and elsewhere.
2164. The English fish feed about here. I have seen spent fish here about the latter end of September—2 or 3 only.
2165. I think those fish had come here to feed.
2166. I do not think the season should be earlier than September; it would be better to keep it open a month later.
2167. There are plenty of fish here now. I think they have come up from the sea.

MR. JOHN STANNARD *examined.*

2168. *By Mr. Allport.*—My name is John Stannard. I am Superintendents' Assistant at the Salmon Breeding Establishment.
2169. I have held that position 18 years.
2170. I was here under Mr. Ramsbottom between 4 and 5 years.
2171. Since his death I have had charge of the Ponds.
2172. I have no records that I can hand to you with respect to the establishment or of the temperature of the water.
2173. I used to keep a record of temperature of the water, but it has been destroyed.
2174. I cannot say how many visitors come to the Ponds in a year; 300 visitors came during one month last summer.
2175. At the time the Ponds were first stocked from a shipment of ova per the *Norfolk*, 300 brown trout were hatched, 200 reared, 50 kept in the upper round pond.
2176. The brown trout ova were quite white.
2177. *By Mr. J. Swan.*—I am sure there was only one box of brown trout ova in that shipment.
2178. *By Mr. Allport.*—The brown trout were hatched in a box specially made for them.
2179. 150 were turned into the Plenty.
2180. The 50 retained were kept as a breeding stock; from the first stock other rivers of the Colony and the other Colonies have been supplied.
2181. It was three years before they reproduced themselves.
2182. There were losses from rats and birds, but not many.
2183. New fish have from time to time been placed in the pond as it required stocking.
2184. One of the fish lived in the ponds for 16 years; it weighed 5 lbs.
2185. *By Mr. Johnston.*—When not at liberty they do not grow to such a size as when in the river.
2186. *By Mr. Allport.*—No pink ova have ever been obtained from the fish in this pond.
2187. I have restocked this pond not only from the progeny of the original stock, but also with brown trout from the River Plenty.
2188. *By Mr. Webster.*—None were taken from the river during Mr. Ramsbottom's life for restocking the pond.
2189. *By Mr. Allport.*—Mr. Ramsbottom left for Sydney just after the second year's spawning.
2190. Thousands of fish from the river have got into the pond through the race. I am not able to say whether any remained. I endeavoured to get them all away.
2191. It is 16 years since it was cleaned out.
2192. I put 25 fish from ova taken from the river into this pond; they were from pink eggs.
2193. Notwithstanding this, I say that we have had nothing but white ova as the produce of such fish.
2194. *By Mr. J. Swan.*—I have got both white and pink ova from the redds in the Plenty.
2195. Some of it I believe to be that of the migratory trout.
2196. I have got pink ova from brown trout.
2197. From a brown trout shown by me to the Commission to-day I got pink ova, and I got that fish from the river ready for stripping.
2198. *By Mr. Allport.*—I have got both white and pink ova from the same redd in the river.



2199. The difference in colour of ova I attribute to the food of the parent.
2200. *By Chairman.*—I have got pink ova from a fish which I believe had never left the Plenty.
2201. *By Mr. Allport.*—Many fish may spawn on one redd.
2202. There is one kind of trout in the Plenty whose ova are always white.
2203. *By Mr. Johnston.*—It is rather a coarse fish, with long nose; it has not the red tinge on the adipose fin. It seems longer and thinner than the ordinary trout. From this type of fish I always get white eggs.
2204. There appear to be two kinds of fish which have red ova. One is a nice bright silvery fish,—I believe sea-going,—black spots upon it; it is very thick in proportion to length—thicker than the one whose ova are white. It has a medium-lengthed tail, nice small head; it is a shapely fish, and has no red tinge on the adipose fin. The other is the ordinary brown trout with the red spots.
2205. We catch more of the latter than of the former.
2206. It is a thick and deep fish.
2207. There are therefore three types of fish as I have described them.
2208. From the red ova I could not tell which kind of fish they came from.
2209. *By Mr. J. Swan.*—I have exhibited two fish to the Commission to-day, the one a brown trout, the other a sea-going fish—from both kinds red eggs are got.
2210. *By Mr. Allport.*—In my opinion the pinkish tinge of the adipose fin of the migratory fish fades away after one or two trips to sea.
2211. I have caught them of different sizes without it. I have caught one 2 lbs. weight without it.
2212. I do not believe they are different fish; I believe they alter.
2213. *By Mr. J. Swan.*—I have seen young fish without the pink tinge to the adipose fin. I have seen some bred from ova obtained from England and some which were bred in the ponds.
2214. Those which were bred in the ponds were supposed to be salmon trout.
2215. I now believe that they were salmon.
2216. From those hatched from ova obtained from the Plenty I have not seen any without the red tip to the adipose fin.
2217. *By Chairman.*—The salmon were originally placed in the Long Pond.
2218. *By Mr. J. Swan.*—All by the *Norfolk*, but one box of brown trout, were salmon ova.
2219. By the *Lincolnshire* came salmon and sea trout.
2220. *By Mr. Allport.*—Above the circular pond the usual artificial rill is provided for the fish to form their redds in.
2221. The practice is to allow the fish to spawn naturally.
2222. *By Mr. Johnston.*—The fish kept in this pond continue fertile.
2223. *By Mr. Allport.*—They are fed on liver principally.
2224. The old fish have died off through fighting and old age; some had fungus.
2225. The fungus is caused by fighting, and rubbing the gravel.
2226. It comes first by wounds.
2227. The disease is not catching.
2228. Plenty have died, I believe, from this fungus.
2229. *By Mr. Johnston.*—The mud now in the pond would, I think, favour the growth of the fungus.
2230. *By Mr. Allport.*—I think that the small area of water, and the food, affects the colour of the ova.
2231. The dimension of the pond is fifteen yards diameter, five feet deep; the rill connected, sixty to seventy yards, twelve feet wide, depth of water from ten inches to one foot.
2232. As to the Long, or Salmon Pond, it and the hatching-house at its head were built especially for the salmon which came by the *Norfolk* at the same time as the brown trout before referred to.
2233. At that time no sea trout came.
2234. About 4000 salmon ova were hatched from the shipment.
2235. The colour of the ova was pink, like the pink ova we get now from what I call the migratory fish.
2236. The young fish from this hatching had, I believe, the red tip to the adipose fin.
2237. A leakage occurred in the pond, when the fish were three months old, and some escaped. We kept back about 400 to 500, liberating the others, and those kept were retained until their smolt stage. Some were kept for one, two, and three years.
2238. I think, if I remember right, the parr had about seven markings on each side.
2239. We marked about 300 of the smolts, and turned them out with what remained.
2240. Before the last were liberated another shipment came by the *Lincolnshire*.
2241. This shipment was of salmon and salmon trout.
2242. I think the salmon trout ova were a paler colour than the salmon ova, but I am not quite sure of this.

2243. There was no difference in size. We hatched 400 to 500 salmon trout and 5000 salmon.
2244. All the ova were hatched in the boxes, but separated by gratings and kept distinct.
2245. When they were old enough after hatching, 50 salmon trout were placed in the lower round pond, the remainder were sent to the Huon River.
2246. The salmon were hatched at the head of the long pond. They were removed into the rill below the long pond and allowed to make their way into the long pond.
2247. At this time there were none of the original stock in the long pond.
2248. One of these lots had the red adipose fin, the other had not. I think the larger quantity had it.
2249. I could see no difference between the young of those of the first and second shipment.
2250. They were kept until the smolt stage, when the gratings were removed; those with the smolt dress left, the parr remained.
2251. None were kept back. The pond was afterwards emptied.
2252. We had not bred any trout up to this point.
2253. Going back to the lower round pond, where the 50 salmon trout were placed—when they took their smolt coat we found that there were two different kinds of fish in it.
2254. One kind with the red adipose fin, which I call silvery trout; the other without it, which I call salmon trout.
2255. If these really indicated two distinct kinds of fish, the mixture was made in England, not here. I am quite sure of this.
2256. We got one dozen out of the 50 without the pink-tipped fin; these were kept in the pond.
2257. Those with the pink tip were liberated in the Plenty.
2258. We bred from those retained,—a good many the first year or two.
2259. After the first or second year they began to die off. None lived more than 6 or 7 years.
2260. They died just after spawning, and had fungus upon them.
2261. *By Mr. Johnston.*—Every spring after spawning they appeared to struggle to escape.
2262. *By Mr. Allport.*—There was no difference between the fungus on these and the trout in the upper pond.
2263. Some of the 12 fish spawned at 3 years old.
2264. Most of the young of this spawning went to the Huon in December, 1869.
2265. They had not the pink tip to the adipose fin.
2266. A few were kept and put into the long pond, which then had no other fish in it.
2267. The survivors of the original 12 spawned in the same rill again, the young from which were turned into the Huon River, the Derwent, and some placed in the long pond with those of the previous year. This was 1870.
2268. In two or three years after this all the remainder of the original 12 died out.
2269. Although the eggs from which the original 12 were hatched were pink, the eggs they deposited were white, like those of all fish kept in confinement at the pond.
2270. The young of the third generation from these 12 did not breed so well as the parents.
2271. There was no difference in the fish; they had not the red tinge to the adipose fin.
2272. *By Mr. J. Swan.*—None of the descendants of the original 12 ever showed the red tip to the adipose fin.
2273. *By Mr. Allport.*—In succeeding years the eggs proved to be unfertile.
2274. We got young from the second generation sparingly as compared with the first, but the third generation proved unfertile—the eggs were matted together.
2275. The balance were turned out in 1881 into the Plenty.
2276. *By Mr. J. Swan.*—I recollect sending some smolts to Hobart about two years ago. I recollect sending one out of the long pond.
2277. I do not remember the year that Sir Robert Officer first captured by net a fish supposed to be a salmon, which fish he sent to the Governor.
2278. *By Mr. Allport.*—Three years after the fish were turned into the Plenty I saw young ones and got ova.
2279. I got both pink and white ova, as now.
2280. It must have been seven years after the liberation of the fish that I heard of smolts passing down the Plenty in schools.
2281. That was in September and October.
2282. It was later than that again that large numbers came down the troughing into the Ponds.
2283. It is 7 years ago.
2284. That has continued every year since in increasing numbers until the last two years, when the number so passing down decreased, owing to the drainage having been choked up with weeds.
2285. *By Mr. J. Swan.*—The first fish taken which was called a salmon was so taken at the mouth of the Plenty in a net. It is quite 10 years ago.

2286. *By Mr. Allport.*—The smolts which came down the troughting in one year about three years ago numbered millions. I could have loaded a cart with them. It took me three weeks to clear them out and put them in the river.

2287. Some were sent to Hobart. They had the red tip on the adipose fin. They were fish 6 to 7 inches long.

2288. They appeared to be all of one kind.

2289. One season a different fish came down mixed with the others—a larger fish, looking like a grilse; there were a few only of them.

2290. *By Mr. Johnston.*—It was from this that I thought that when the fish went to sea it lost the colour of the adipose fin.

2291. *By Mr. Allport.*—The ponds have been constantly restocked from the river.

2292. The first sea-going fish from which ova was stripped, taken from the river, was a fish weighing 22 lbs., which fish I refer to above as a silvery trout.

2293. *By Mr. J. Swan.*—I never considered that fish to be a salmon.

2294. I only judged it to be a sea-going trout from what I heard from others.

2295. It had a red tip to the adipose fin.

2296. The brown trout has a red tip to the adipose fin.

2297. It had no red spots and a brown trout has.

2298. *By Mr. Allport.*—The eggs from this fish were pink; they were placed in the hatching-house in a box by themselves.

2299. The fish was returned to the Plenty.

2300. I caught the male fish, which was of a golden-yellow colour, and smaller than the female; it weighed about 7 lbs.

2301. The adipose fin had a red tip like the female.

2302. The female was of a nice bright colour.

2303. The female was like those taken at Bridgewater, but the male was like those which have been in fresh water.

2304. I hatched about 1000 of the ova.

2305. The ova were very large, larger than the salmon ova which came from England.

2306. They were kept back in the 4th pond and 50 were ultimately placed in the round pond, made on purpose, where they now are. No other fish were allowed access to that pond.

2307. The remainder were turned into the river.

2308. They had originally the pink tip to the adipose fin, but the colour has disappeared.

2309. I think that it is not going to sea alone which causes the loss of their colour, but the age also affects the colour.

2310. When they were three or four years old the colour had gone.

2311. The difference between these and the salmon trout is, that one is more graceful, has a swallow-forked tail, and brighter; the other is less graceful.

2312. They spawned for the last four years all white eggs. The young have been distributed amongst the other colonies.

2313. I have not attempted to keep as breeding-fish any of the second generation of the 22 lb. fish.

2314. I am still using the progeny of the 22lb. fish as breeding-fish.

2315. The ova do not hatch as well as the ova of brown trout.

2316. I notice the same peculiarity with the ova as with the salmon trout which were previously kept in the lower round pond.

2317. The fish are dying out. The females get two years spawn in them and die.

2318. *By Mr. J. Swan.*—No ova have ever been sent from the Ponds which were represented as salmon ova.

2319. *By Mr. Allport.*—No fish, so far as I can remember, were taken from the river the same year for replenishing the ponds.

2320. The only fish taken since then have been some of the smolts which came down the troughting.

2321. I have 100 of these in the ponds now—50 of 4 years old, 50 about 3 years. Some of them spawned last year.

2322. The ova was white. They hatched last year. Some I sent away.

2323. I have not any of the young fish hatched from these eggs. The young had the red-tipped fin.

2324. The fish I have named are the only fish taken for the purpose of replenishing the ponds.

2325. *By Chairman.*—There were no other description of fish in the river which could have been taken to replenish the ponds.

2326. *By Mr. J. Swan.*—The progeny of the 22lb. fish now in the pond, and the smolts from the river, are neither of them equal in brightness of coloring or in general salmon-like appearance to the so-called salmon trout raised from the ova by the *Lincolnshire*.

2327. *By Mr. Allport.*—I have caught small fish in the Derwent as bright as the *Lincolnshire* salmon trout, about 2lbs. weight. They had not the red tip to the adipose fin.

2328. I caught one two years ago, and one I saw last year.

2329. I have collected ova from the Plenty and the Lachlan for distribution in Tasmania and the other colonies.

2330. I have not taken them from any other stream.

2331. I have taken pink and white eggs from both streams.

2332. This is the first year I have taken any from the Lachlan.

2333. From the Plenty I have taken them for 15 years.

2334. I have taken them in water of different depths.

2335. I have taken them brighter in colour than the imported ova.

2336. I have taken them in June, July, and August, but most abundantly in July.

2337. The latest date I have known fish to spawn was 5th August, the earliest date 20th May.

2338. I have watched the fish on the redds. The heaviest I have seen was in the Plenty, about a mile above the Ponds, weighing from 20 to 25 pounds.

2339. I thought from its appearance that it was a sea-going trout.

2340. I collected about 60,000 ova last season.

2341. *By Mr. Johnston.*—When the eyes are seen all ought to hatch. Before the eyes appear we generally lose about ten per cent.

2342. *By Mr. Allport.*—When opening a redd if I find a number dead I cover the whole up again and leave them.

2343. The larger proportion of nests in the Plenty contain good ova.

2344. By a bad nest I mean one where the eggs are dead.

2345. In the Plenty I find a dozen nests of pink eggs to one of white.

2346. In the Lachlan the proportion is the same.

2347. There are more nests in the Lachlan than in the Plenty.

2348. The reason why I went to the Lachlan this season was on account of there being too much water in the Plenty.

2349. I have seen the fish spawn in the Styx and Dry Creek.

2350. *By Mr. Johnston.*—Millions of ova are hatched naturally in the Plenty.

2351. The natural supply would therefore be great if not destroyed by natural enemies.

2352. Their greatest enemies are the large fish, and the fresh-water flathead, which destroy the fry.

2353. *By Chairman.*—The cormorants are not so plentiful as they were.

2354. *By Mr. Allport.*—There are places in the Lachlan where fish-ladders might be useful if the obstacles were not blown up. Gratings should be placed against mill-races, but it is not done.

2355. There is more poaching in the Lachlan at this present time than in any stream in the colony that I know of.

2356. I think it is owing to the present Act not being carried into effect. The gratings are not put upon irrigation drains as they ought to be.

2357. I have killed four kinds of fish in the Derwent—three kinds of trout, and one which may be either the salmon or salmon trout.

2358. I have taken whitebait as high up as Dry Creek.

2359. The migratory fish follow up the whitebait.

2360. *By Mr. Johnston.*—Seeing the value of the Lachlan as an ova-producing stream, I think it important that it should be specially protected, at least during spawning time.

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MR. JAMES LUMSDEN *examined.*

2361. *By Mr. Allport.*—My name is James Lumsden. I am a resident of New Norfolk, and a professional fisherman.

2362. I have been a fisherman on the Derwent for 50 years.

2363. I remember when the fresh-water herring were plentiful. I have caught over 100 dozen in a day, fly-fishing.

2364. *By Mr. J. Swan.*—I commenced fishing at break of day. It took me about eight hours to get them.

2365. *By Mr. Allport.*—I remember when they got the disease which destroyed them.

2366. The disease appeared to be in the nose.

2367. I do not remember how long ago this was, but it was before the salmon were introduced.

2368. I caught a great many salmonoids this last season.

2369. I sold them at a good price. It paid me to catch them.

2370. At the first of the season, for a month or two, the fish caught are not in good condition.  
 2371. The fish are best when full of spawn.  
 2372. *By Mr. J. Swan.*—I caught above 100 salmonoids last year by spinning and trolling.  
 2373. They would weigh above 4 lbs. each all round.  
 2374. I sold some at 1s. a lb. ; about 9d. or more all round.  
 2375. *By Chairman.*—It is about 4 years since I caught native herring in the Derwent.  
 2376. *By Mr. J. Swan.*—It is a long time since I caught any quantity in the Derwent; it is about five years ago.
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MR. OCTAVIUS BLOCKEY, *Hotel-keeper, New Norfolk, examined.*

2377. *By Mr. Allport.*—I am proprietor of the *Bush Hotel*, New Norfolk.  
 2378. I have had considerable experience in fishing.  
 2379. Visitors from all the Colonies stay at my hotel.  
 2380. I have been appointed an agent for the sale of fishing licences.  
 2381. My sale of licences last season was 55.  
 2382. The licence fee was 10s.  
 2383. I would suggest that the licence fee for the season should be more than it is. There should be a monthly and a weekly licence.  
 2384. Visitors complain of having to pay as much for a week or month as others do for the whole season.  
 2385. In nine cases out of ten visitors prefer not fishing to paying the licence fee.  
 2386. From this cause there has been a great loss to the revenue.  
 2387. A great many visitors come up solely for the fishing, but decline to fish when they know the licence fee.  
 2388. No fish are offered to me for sale out of season.  
 2389. I have every reason to believe that poaching is largely practised.  
 2390. There are no bailiffs for the protection of the river in this district.  
 2391. If there was good fishing it would be of great advantage to the district.  
 2392. The fish have not been so plentiful the last two seasons as previously.  
 2393. *By Mr. Johnston.*—I believe a large number of fish go up the Lachlan about June.  
 2394. I have heard of fish being destroyed there illegally.  
 2395. It would be difficult to protect that stream without some one being appointed to watch it.  
 2396. *By Chairman.*—At the beginning of the season the fish taken here are very poor.  
 2397. I have never seen a well-conditioned fish taken in September.  
 2398. *By Mr. Allport.*—It has often occurred to me that if the fish were kept at the Ponds, and turned out in large numbers when about 3 months old, the river would soon be stocked. The young in the river are now destroyed from various causes.  
 2399. The breeding establishment, in addition to supplying other parts of the Colony and other Colonies, should supply the Derwent first.  
 2400. If there was more fishing, there would be more visitors to New Norfolk than there are.  
 2401. *By Mr. Johnston.*—It would seem as though the fish have decreased in the Derwent the last two years.  
 2402. My reason for the decrease is that some cause is at work which is destroying the spawn or young fry.  
 2403. I am aware that the take appears to be on the increase at Bridgewater.  
 2404. This may be accounted for by the fact that it is only lately that fishing there for salmonoids has been practised.  
 2405. The mullet and white bream come up the Derwent as far as Valleyfield in March and April.  
 2406. The shrimps are found on the same banks. I have found them in large numbers in the bream when opening them.  
 2407. *By Chairman.*—Herring have been seen, but not taken here of late years.
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MR. WILLIAM WISE, *Master of the "Monarch" Steamer, examined.*

2408. *By Chairman.*—I have had 3 years' experience fishing in the Derwent; during that time I have fished a great deal.  
 2409. The last season the fish did not show so plentifully in the Derwent between Hobart and New Norfolk, but it is my opinion that was owing to the mild winter, and no freshes till too late to drive the fish down.

2410. At the present time they are to be seen about Bridgewater, in consequence of the winter rains being so heavy ; and I believe more fish will be taken than there were last season.

2411. I have also noticed that last season the fish were later spawning than the two previous years.

2412. I believe I have caught 4 different kinds of fish,—I call them salmon, salmon trout, white or sea trout, and brown trout.

2413. The heaviest I got was 2 years ago, and it weighed 14½ lbs. It was, I think, a sea or white trout.

2414. *By Mr. J. Swan.*—The largest sized fish taken by me which I call a salmon, was about 6 lbs.

2415. The flesh being pink, the arched back, and red spots are the reasons why I think it was a salmon.

2416. *By Mr. Allport.*—In the height of summer, when the river is low, the water is brackish 2 miles above New Norfolk, but in winter fresh water may be found below Bridgewater, and brackish as low as Risdon.

2417. The fish which have spawned are now making down to Bridgewater.

2418. The season in the main stream could be kept open a month later, as it is my opinion the sea-going salmon do not come up into the stream until after the season closes.

2419. *By Mr. J. Swan.*—I have never caught a salmon in the tributary streams.

2420. The scales of the fish I call salmon come off easily when handled.

2421. *By Mr. Allport.*—During the first fortnight of the season I have known spent fish to be taken at Bridgewater. About New Norfolk at such time they are not worth taking.

2422. The only fish worth taking are below the Lime Kilns.

2423. *By Mr. Johnson.*—My opinion is that, on the whole, the fish are on the increase.

2424. *By Mr. Allport.*—I think that at the Ponds the ova should be collected and reared, and then turned into the Derwent.

2425. The small fry (whitebait, &c.) come up the Derwent in increasing numbers every year, particularly the last two years.

2426. They come up at all times ; they were up a few weeks ago.

2427. *By the Chairman.*—I have seen them below the Jordan in the Derwent in September.

2428. *By Mr. Allport.*—They work up the river. They are retarded by floods, but afterwards go up.

2429. The salmon and trout, and indigenous fish follow them up.

2430. I have known them (the whitebait, &c.) to go up as high as the mouth of the Clyde.

2431. I know that poaching is practised, and would suggest that an officer be appointed for this District.

#### THURSDAY, 3RD AUGUST, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, J. Swan, Esq., A. G. Webster, Esq., C. T. Belstead, Esq., C. Allport, Esq., A. Riddoch, Esq.

#### MR. WILLIAM WHITEHOUSE, *Fisherman, examined.*

2432. *By the Chairman.*—My name is William Whitehouse. I am a fisherman, and have fished in Tasmanian waters for 43 years.

2433. I have taken oysters at Recherche Bay, Southport, Port Esperance, Shipwrights' Point, Port Cygnet, Cloudy Bay, Oyster Bay, North-West Bay, Barnes' Bay, in D'Entrecasteaux Channel and neighbourhood.

2434. I have not taken any on the outside of Bruny Island.

2435. I have got them at Carlton, Norfolk Bay, the Sounds (rock oysters), Eagle Hawk, Wedge Bay, and Port Arthur at the head of Long Bay.

2436. On the East Coast at Spring Bay, Prosser's Bay and River, Little Swanport, Schouten Main (Great Swanport), Swanwick.

2437. I have never been past Great Swanport on the East Coast for oysters.

2438. I have left Hobart and returned in 10 days from Spring Bay, or Southport, with 12,000 to 14,000 oysters,—a boat load.

2439. At that time they could be got all the year round.

2440. This was upwards of 20 years ago.

2441. I have been in Spring Bay with 17 other boats, all oystering, and doing well.

2442. *By Mr. J. Swan.*—I have known the oysters dredged at Southport by the Government to burn for lime. I have heard also of this being done at other places.

2443. *By the Chairman.*—I have taken oysters in the River Derwent.

2444. There was at one time a tramway across East Bay Neck and Ralph's Bay Neck, but the latter was a bad place for crossing.

2445. The ordinary dredge was used for oystering, but in fine weather we used a hand net.
2446. The water in Spring Bay was, at deepest, only 3 fathoms.
2447. In Swanwick at Cole's Bay, and off the Schouten Main, I have dredged in 5 or 6 fathoms.
2448. *By Mr. Belstead.*—The greatest depth at which we could dredge with our appliances is 10 fathoms.
2449. We could get oysters in deeper water if we had the appliances. I am sure there are oysters in the deeper water.
2450. I think in deep water off Great Swanport there are oysters.
2451. *By Mr. J. Swan.*—I know that there are oysters at a greater depth than we can dredge, but at a depth at which we can dredge they are not now to be got in payable quantities.
2452. They are not in payable quantities because they are worked out.
2453. At Cloudy Bay and some other places the oysters have been destroyed by bad weather; the mud covered the beds.
2454. *By the Chairman.*—I attribute the failure of the oyster supply in other places to a disease amongst them.
2455. On the pearl lining of the shell of a diseased oyster there is a yellow stain; when a healthy oyster was opened it presented a white appearance.
2456. *By Mr. Belstead.*—I have found a great many oysters tinged in the same way, more especially at Cloudy Bay.
2457. After seeing this appearance I have noticed that the beds in a short time (a season or two) become barren.
2458. *By the Chairman.*—A tidal wave did a great deal of harm to the Spring Bay beds about 12 years ago.
2459. Through that wave the beds were covered with mud.
2460. This wave did not appear to touch any other beds on the Coast.
2461. *By Mr. J. Swan.*—Now I cannot go anywhere as I used to, with paying results, for oysters.
2462. They are so scarce it is not worth my while to go for them.
2463. When plentiful they brought 25s. to 30s. a thousand wholesale in the market.
2464. I have sold them in the market at 2s. a hundred, retail.
2465. The price now would be £3 to £3 10s. a thousand, wholesale.
2466. *By Mr. Webster.*—I have taken upwards of 100,000 oysters in a season.
2467. *By Mr. J. Swan.*—Other boats might average 50,000 oysters a year.
2468. *By the Chairman.*—There were 17 boats engaged in fishing for oysters in those days.
2469. From Southport, at its best, I believe 250,000 oysters were taken in a year.
2470. From Spring Bay there would be more got than from all the other beds in the Colony; there might have been 15,000 to 16,000 bags in a year.
2471. From Swanport there might have been 6000 to 7000 bags.
2472. I cannot give any idea of the numbers taken from Port Esperance in one year.
2473. The oysters began to fall off in number 12 to 14 years ago.
2474. *By Mr. Belstead.*—They have been getting scarcer every year.
2475. *By the Chairman.*—I have seen no improvement at any time.
2476. I do not think the Victorian vessel which fished in Spring Bay did any harm.
2477. *By Mr. Belstead.*—They did no more harm than the local fishermen.
2478. *By the Chairman.*—The greater quantity of oysters we used to get went to Victoria.
2479. The greater number of fishermen used to cast the small oysters back again.
2480. *By Mr. Webster.*—There was then no sale for the small oysters.
2481. *By the Chairman.*—I have laid a good many artificial beds. I laid a bed of 20,000 for Mr. T. Y. Lowes, at Glenorchy.
2482. They all died through being shifted out of their own water.
2483. My experience is that Tasmanian oysters will not bear shifting.
2484. I took them from inside of Southport and laid them outside, and they also failed.
2485. They must, to succeed, be moved to near their original bed.
2486. *By Mr. Allport.*—Along the East Coast sometimes the beds are on a cockle-shell bottom, sand and mud, gritty but hard, without drift. Weeds grow all over them—sometimes grass a foot high, and a mud bottom with less grit and very little grass.
2487. *By the Chairman.*—It is not usual to find grass on oyster beds, except occasional patches.
2488. *By Mr. Allport.*—I do not think fine grass injures the oysters.
2489. The ground in D'Entrecasteaux Channel, where we got the oysters, is similar ground,—grass there in some places.
2490. I know of three kinds of oysters in Tasmania,—the mud oyster, taken out of channels, on grounds as above described; the bed oyster, from the hard ground. (The difference in these oysters is

caused by the difference in the grounds from which they are taken: the bed oysters are from brighter and clearer, and generally deeper water, than the mud). The third, rock oysters, in bays, attached to rocks and timber.

2491. The rock oysters are better than the others.

2492. I successfully moved oysters at Southport. I put them over ground 10 chains by 4 chains, in 2 fathoms of water,—small oysters about 2 years old; and the following season I took off that ground 50,000 marketable oysters.

2493. *By the Chairman.*—The stock were not moved more than 400 yards.

2494. *By Mr. Allport.*—They did not spat.

2495. I have found oysters milky and spawnly at two years old.

2496. The oysters I took off the bed were not milky.

2497. I have thrown them down at other places on their natural beds, and they have bred there.

2498. The greatest distance I have moved them with success was half a mile.

2499. Those at Mr. Lowes' were all dead in twelve months.

2500. *By Mr. Webster.*—Oysters begin to spat about November.

2501. *By Mr. Allport.*—I have found a bed with some diseased and some healthy. The disease would afterwards spread. I attribute it to the water.

2502. I have found it so in winter and summer.

2503. It was not universal: it occurred at one place one time and at another place another time.

2504. I have known a bed to temporarily recover from the disease,—Cloudy Bay especially; but this was years ago.

2505. There is no appearance outside the shell of the disease.

2506. *By the Chairman.*—There was a time forty or forty-five years ago, when oysters were as scarce as they are now.

2507. They were scarce for three or four years.

2508. I think that the oyster beds will now recover themselves again.

2509. *By Mr. Allport.*—The oysters were most affected by the disease in the hot weather.

2510. *By Mr. Webster.*—I do not think that diseased oysters will spat.

2511. *By Mr. J. Swan.*—In addition to my business as an oyster dredger, I have fished with a seine.

2512. I have worked from Southport to Hobart in all the bays.

2513. From Sorell to the Iron Pot, and round Norfolk Bay.

2514. The fish I have caught were flounders, garfish, mullet, native salmon.

2515. The supply of late years has fallen off.

2516. I attribute that a good deal to the graball boats, since the graball came into general use amongst the hook and line fishermen.

2517. This would not apply to the flounders.

2518. These are scarcer than they were.

2519. I cannot account for this.

2520. I have been fishing formerly when there were 12 or 13 boats, all doing well; now there are only 3.

2521. I do not consider the scarcity arises from over-fishing now.

2522. I do not think it arose from previous over-fishing when there were the 12 or 13 boats.

2523. When I was at Southport, 15 or 16 years ago, we used to go when the breem were in; we used at times to get 20 dozen of flounders. Now there are very few there.

2524. I have caught the English fish from time to time.

2525. The greatest distance from town where I have taken one was Connolly's Marsh, 3 miles from Carlton. I caught one there 18 inches long.

2526. I have caught them in North-West Bay, and Little Ratty on Bruni shore.

2527. The largest English fish I caught was 10 lbs. 10 ozs., taken in Sandy Bay. It was not examined scientifically.

2528. In Ralph's Bay I have taken a great number.

2529. The greatest number I have got in one night there was five or six, weighing  $1\frac{1}{2}$  lbs. to 2 lbs. each. I have known others to get them there weighing 5 to 6 lbs.

2530. I have also fished with the seine in the preserved waters of the Derwent, under the supervision of an officer appointed by the Salmon Commissioners.

2531. I have so fished about five times.

2532. On all those occasions I got some English fish, which I always gave up. There were other fish caught which I retained.

2533. No Salmon Commissioner was with me on any occasion.

2534. As a result of these trips I never took any of the fish to any member of the Salmon Commission.



2535. If any one says I caught fish for any of the Salmon Commissioners on those occasions it is incorrect.

2536. I have given away English fish that I have caught in the seine at other times, but never to a Salmon Commissioner.

2537. The smallest sized English fish which I have seen was about nine inches long.

2538. *By Mr. Allport.*—It was caught about September.

2539. *By Mr. J. Swan.*—At Howrah I remember taking 50 or 60 small English fish which had to be put back.

2540. I have taken six at a haul in South Arm. They were each about a foot long.

2541. I have seen an English fish over two feet long, which rolled over the net and escaped.

2542. *By Mr. Webster.*—I have caught upwards of two dozen in a net. They were small, and I put them back.

2543. Mullet are not taken in the graball, except large ones.

2544. I attribute the scarcity lately to the snow-water.

2545. *By Chairman.*—I think the snow-water drives the fish outside.

2546. *By Mr. Riddoch.*—Mullet are scarcer now than they were formerly.

2547. *By Chairman.*—The mullet come up into the bays to spawn.

2548. *By Mr. Webster.*—I think they spawn in the summer time.

2549. *By Mr. J. Swan.*—When the large mullet come in in the summer time they are full-roed.

2550. *By Mr. Allport.*—Although I think the snow-water drives the fish down, I cannot account for the reported heavy takes of fish at Risdon by the rod fishermen.

2551. I am unable to speak as to the fishing in the Derwent, about the harbour, with the line or rod, 20 years ago.

2552. It is only within the last few years that rod-fishing has come up.

2553. The number of rod-men have increased.

2554. I saw English fish jump at South Arm towards Christmas.

2555. All the English fish I have taken were bright silvery fish.

2556. I have caught many hundreds, most of which I have put back.

2557. I have caught at least 100 worth keeping. Some I have sold. I have got from 10s. to 25s. a piece for them.

2558. I cannot give any reason for the flounders having fallen off at Southport.

2559. My seine net is 55 fathoms long; the depth 13 feet in the bunt, the mesh half inch in the bunt; that is, the garfish bunt.

2560. The mesh, when the garfish bunt is not there, is one inch, except the shoulders, where the mesh is not quite so large.

2561. The garfish we get at East Bay Neck, the Sounds, Norfolk Bay, D'Entrecasteaux Channel, and Port Esperance.

2562. There are none in the Derwent except stragglers.

2563. The native salmon we take are not a valuable market fish. They are only marketable when other fish are scarce.

2564. The graball nets of which I have spoken are from 15 to 25 fathoms long, mesh 2 to 2½ inches.

2565. Trevally only come in occasionally every two or three years. Formerly they came in more frequently.

2566. They used to come in about the autumn.

2567. I cannot assign any cause for their falling off.

2568. Have you formed any opinion as to the propriety or otherwise of opening the River Derwent to netting; and, if so, will you give us your opinion and reasons? I think it almost time it was opened for trial now; it has been shut up long enough. By trial I mean a season so many months in the year. We do not want the garfish bunts. I would propose June, July, August, and September: as far as the Cemetery, Cornelian Bay, on one side, and the upper side of Lindisferne Bay on the other: one-inch mesh for the nets.

2569. *By the Chairman.*—A 3-inch mesh net would catch a flounder of 9 inches,—the regulation size.

2570. *By Mr. Webster.*—In the river where it has not been open I have caught plenty of flounders on the occasions already mentioned.

2571. *By Mr. Allport.*—I have got 15 dozen flounders in one night on one of those occasions.

2572. *By the Chairman.*—The fresh brings the flounders down from the preserved waters in winter.

2573. *By Mr. Allport.*—In the now preserved water I would expect to get mullet and native salmon.

2574. The mullet stop up the river a long time while they are small; when large they go out.

2575. *By the Chairman.*—The river is a nursery for the young fish, and there are always great quantities of brood or young fish there.

2576. The fish being bred in the upper waters do not come down until of large size.

FRIDAY, 11TH AUGUST, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, J. Swan, Esq., C. T. Belstead, Esq., A. G. Webster, Esq., R. M. Johnston, Esq., Curzon Allport, Esq., A. Riddoch, Esq.

MR. CURZON ALLPORT, of Hobart, *Solicitor, examined.*

2577. *By Mr. Johnston.*—I have had experience in fishing. My principal experience during the last four years in Tasmania relates to the introduced fishes.

2578. Some years ago I visited the Stormontfield ponds on the Tay, in Scotland, and made sketches of them, from which sketches the fish-breeding establishment at the River Plenty, Tasmania, was constructed.

2579. I have fished the River Derwent from Macquarie Point to the rapids at Belmont once each week in the season, with few exceptions, during the last 4 years, and occasionally prior to those 4 years.

2580. I have noted the movements of the migratory fish as closely as I could.

2581. I do not agree with those who say that the fish run up in the early part of the season, because I find spent fish in the fresh water at New Norfolk, and in the brackish water below I find fish which have recuperated. I think they have mistaken the fish which follow the food as the water becomes brackish higher up the river.

2582. I do not think the fish run up early in the season for the purpose of spawning.

2583. I think that the largest and heaviest fish come down immediately after spawning, probably in July and August. They then make for the sea.

2584. The smolts come down in August and September.

2585. The smolts do not go down to sea with the spent fish.

2586. *By the Chairman.*—I think that there are many moderate-sized fish which stop in the brackish water for a while and then follow the food up.

2587. *By Mr. Johnston.*—I designate these latter as a variety of trout which enter brackish water.

2588. *By Mr. J. Swan.*—If any such fish had been imported here, I would have believed them to be a variety of sea-going trout differing from salmon trout.

2589. *By Mr. Johnston.*—As to the real migratory salmonoid of the Derwent, the first I have noticed, in distinct and large schools of fish weighing from 2 to 4 pounds each, were at Lime Kiln Reach, near New Norfolk, in September in one year, and December in another, travelling from 3  $\frac{1}{4}$  to 4 miles in an up-stream direction in a week. I caught some on each occasion.

2590. There were no indications of their being in pursuit of food.

2591. I think they were running in the direction of their spawning-ground.

2592. The fish in these schools were about the same size.

2593. The same fish I have known to be caught later in the Styx, about 12 miles above New Norfolk.

2594. That is a suitable river for spawning.

2595. These are quite distinct from those previously spoken of as pursuing the fry.

2596. Streams entering the Derwent suitable for spawning that I know are the Plenty, Lachlan, Sorell Creek, Humphrey's Rivulet, and the Styx.

2597. The Sorell Creek is closed against the fish by obstructions of timber at its mouth.

2598. I do not think that the migratory fish ascend the Derwent above the Falls on Mr. Gellibrand's estate.

2599. I think there is a natural barrier there which prevents their further progress.

2600. This obstruction should be overcome by fish-ladders, which are also needed on points of the Lachlan. They could be easily constructed, and are absolutely necessary.

2601. Owing to the rapid rise and fall of the small streams which the fish enter, they are sometimes imprisoned until the following autumn, and are poached largely in the meantime.

2602. This imprisonment accounts, in my opinion, for spent fish being caught in the autumn.

2603. There are other upward runs of fish, a heavier one, which goes up in February. I have taken them from 6 to 8 lbs., and caught them in the rapids higher up.

2604. I have observed this for more than one season. Last season, owing to floods, they did not go up until late.

2605. At the tail end of the second run the largest fish go up. This is after the fishing season has closed, in May.

2606. I am fully convinced of this.

2607. With regard to their downward movement, I think they come down in July. The largest fish stays but a limited time owing to the short streams in which they spawn.

2608. They seem to be more numerous towards September, running downwards.

2609. The movement is gradual as far as I can learn.

2610. In the second movement the fish are smaller; owing to their being out of season I cannot tell their weight.

2611. I have no means of knowing when the last of the run have cleared out of the upper waters of the Derwent in their progress seawards.

2612. *By the Chairman.*—I think it is all winter spawning here.

2613. *By Mr. Johnston.*—I do not think the largest fish will be caught while the present close season exists.

2614. I have not seen one caught in fresh water.

2615. My reason for this is that they ascend the fresh water in the close season, and leave again before the season opens.

2616. *By Mr. J. Swan.*—I have seen migratory fish taken from the salt, and occasionally in brackish water, very bright and silvery, some of them almost spotless.

2617. I think that they fall off in condition and lose their brightness in fresh water, and if in such water long enough immature fish might alter their appearance and possibly show spots; but I am quite clear that such a fish could not be taken in fresh water and be mistaken for a brown trout.

2618. *By Mr. Johnston.*—From my four years' experience I am sure that the fish are on the increase. I instance two catches—one of 117 fish weighing 542 lbs. in season 1880-81; and last season 147 fish weighing 692 lbs. This was at New Norfolk—one man's rod.

2619. I think this increase is a fair indication of the catches of other men.

2620. So far as I am aware, the fish are increasing all over the Colony.

2621. The principal feed of the fish spoken of as following the fry are what are commonly called "whitebait."

2622. I have noticed these as high as the Plenty.

2623. *By Mr. J. Swan.*—I think that many unlicensed persons fish in the Derwent and its tributaries.

2624. I have been informed of several members of a family fishing on one licence.

2625. Many fish are caught with the gaff, night-lines, set-lines, and in those holes where the fish are waiting for the freshets to escape many are killed by pointed sticks.

2626. I have heard of a regular trout-spear being used, but I have never seen one so used.

2627. I do not think it is in the power of the local police to suppress poaching.

2628. I am aware that the preservation in England is not undertaken by the police.

2629. I think that protection is absolutely necessary, and that bailiffs should be appointed.

2630. *By Mr. Johnston.*—Other English fish have been introduced into the waters of Tasmania; viz.—English perch, the first of which were brought from England by me in 1861, and produce whereof have been distributed by the late Morton Allport all through the colonies. The increase of these fish, especially in the warmer climates, has been marvellous. Tench and carp have also been introduced successfully.

2631. I may also mention the *Gourami*, which was brought from the Mauritius to within a day's sail of Launceston and then accidentally lost.

2632. There is a mollusc as to which no evidence has been taken. It is commonly known as the scollop (*pecten fumatus*).

2633. I have known great quantities of them to be brought from Port Esperance years ago, which were highly esteemed as food.

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### WEDNESDAY, 16TH AUGUST, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, R. M. Johnston, Esq., A. G. Webster, Esq., A. Riddoch, Esq., John Swan, Esq., C. T. Belstead, Esq.

MR. CHARLES PURDY *examined*.

2634. *By Mr. J. Swan.*—My name is Charles Purdy; I reside at Macquarie Harbour; and am Sub-Inspector of Police stationed there.

2635. I have resided there more than two years.

2636. I know something of the fish to be got about there.

2637. I have observed rock-cod, mullet, sole (I saw one washed up in the harbour, but they are plentiful at the Heads), flounders at the Heads, ling, (one has been caught 3 ft. 6 in. long), butterfly gurnet, sharks and dogfish, mullet, bastard trumpeter; off Cape Sorell, porpoises, skate.

2638. The River Gordon runs into Macquarie Harbour, and in it are to be found cucumber mullet, and mountain trout are in the creeks.

2639. It has been said that a blackfish was caught in the River Henty, but I doubt it.

2640. *By Mr. Johnston.*—The trout referred to is a very transparent fish with round spots upon it, and a groove along the back.

2641. The largest I have seen was 3½ to 4 inches in length.

2642. I do not know the mountain trout caught here.

2643. *By Mr. J. Swan.*—Eels are very plentiful.

2644. I have not seen any large fresh-water lobsters, as in the northern rivers.
2645. I have fished with a graball outside the Heads, and I caught bastard trumpeter, real trumpeter, native salmon-trout (one was of immense size), kelp-fish, parrot-fish.
2646. I tried line-fishing, and caught trumpeter and rock-cod.
2647. Barracouta are caught by persons trading between Trial and Macquarie Harbours.
2648. I never heard of any kingfish having been seen.
2649. *By Mr. Johnston.*—It was the silver bastard trumpeter I caught, very fat, as were also the real trumpeter.
2650. The deepest water in which I used the line was five fathoms.
2651. *By Mr. J. Swan.*—I have not seen garfish or bream at Macquarie Harbour.
2652. I fished with a seine at the mouth of the Pieman and got flounders and mullet; no other fish.
2653. Crayfish are found in the kelp off Cape Sorell, and also at Mount Heemskirk and Trial Harbour.
2654. *By Mr. Johnston.*—They are numerous, and attain a large size in places.
2655. The average size is from 1 to 2 lbs.; the largest I have seen weighed 2 lbs.
2656. *By Mr. J. Swan.*—In the Pieman in fresh water cucumber mullet are plentiful; there are no blackfish or bream.
2657. *By Mr. Johnston.*—No freshwater lobsters are found there.
2658. I have not at any time seen large shoals of small fish off the coast.
2659. *By Mr. J. Swan.*—I have seen old shells at Macquarie Harbour, but do not know of any oyster-bed, nor have I seen live oysters.
2660. *By Mr. Johnston.*—I have not caught a flathead on the West Coast.
2661. The real trumpeter there weigh about 5 lbs. I weighed one of that size.
2662. I never caught an old-man trumpeter there.
2663. Ling is the fish most prized on the Coast as food.
2664. *By the Chairman.*—Only half a dozen have been caught since I have been there.
2665. *By Mr. Johnston.*—I know the perch; I have not caught any on the West Coast.
2666. I have not seen there any silver trevally, or snotgall trevally.
2667. Bastard trumpeter is the fish to be depended upon for quantity.
2668. No boats are regularly employed in fishing on the West Coast.

MR. HENRY LLOYD, *Master Mariner, Hobart, examined.*

2669. *By the Chairman.*—I have been trading to Macquarie Harbour for 20 years.
2670. Outside Macquarie Harbour I have caught but few fish, except barracouta and crayfish. I once found two kingfish on the rocks off Cape Sorell.
2671. *By Mr. Belstead.*—We fished with graball nets and hand-lines.
2672. *By the Chairman.*—I have no further knowledge of the fish to be got outside Macquarie Harbour.
2673. Inside the Harbour there are ling, rock-cod, whiptail (as large as middling-sized barracouta). I have seen as many whiptail as would load a waggon.
2674. The rock-cod are very large. I have caught them double the size of those got in the Derwent, 5 to 6 lbs. or more.
2675. *By Mr. Webster.*—I never caught flathead inside Macquarie Harbour.
2676. *By the Chairman.*—Mullet and native salmon are at times very plentiful.
2677. I have got flounders, soles 7 inches across, stingray, and skate.
2678. I have seen the shore at high-water mark lined with tons of small fish which had been washed ashore; we put them down as sardines. This was a few years ago.
2679. I have never seen bream inside Macquarie Harbour.
2680. *By Mr. Webster.*—In the fresh water I have taken fresh-water mullet in the Rivers Gordon, Franklin, and King; also small trout, eels, odd blackfish about 10 inches long, in the Franklin and Gordon.
2681. *By Mr. Johnston.*—I know the fresh-water flathead I caught.
2682. I am sure the fish I call blackfish were not trout.
2683. *By Mr. J. Swan.*—I have not seen the blackfish which are caught in the northern rivers.
2684. I caught some 14 miles up the Franklin River. I am sure they were not rock-cod.
2685. *By Chairman.*—I have caught lobsters in the Gordon as large as a good-sized crayfish.
2686. *By Mr. Johnston.*—We caught them in the river, and in a large lagoon alongside which was open to the river.
2687. I have eaten them; they are of fine flavour.

2688. *By the Chairman.*—There are oysters in Macquarie Harbour—mud oysters. I think they are to be found in quantity towards the Heads in the channels opposite the mouths of creeks.

2689. I saw some last time I was down there,—4 or 5 years ago.

2690. I know Port Davey well. There are more fish to be got there than at Macquarie Harbour.

2691. *By Mr. Johnston.*—The principal fish there are flathead, rock-cod, bastard trumpeter, native salmon, horse-mackerel, perch; very good place for real trumpeter; kingfish, crayfish, oysters (I think there are great quantities—every low tide we could get 4 or 5 bags; this was about two years ago.

2692. *By the Chairman.*—The kingfish come in in the winter, following the horse-mackerel. I cannot fix the time exactly.

2693. *By Mr. Johnston.*—Flounders are not abundant.

2694. *By the Chairman.*—I do not think oysters are becoming scarcer there. Some years they get a disease.

2695. When diseased the shells are of a rusty colour. Both rock and mud oysters are there.

2696. *By Mr. Webster.*—Trout and eels are to be found in the fresh-water rivers leading into Port Davey.

2697. *By the Chairman.*—I never saw lobsters there.

2698. *By Mr. Johnston.*—I never saw a garfish there. I have got mullet and native salmon.

2699. I have not seen shrimps or prawns there. I have seen plenty in Recherche, but not further round the coast.

2700. There are not any professional fishermen on the West Coast.

2701. Piners fish there with a seine.

2702. There may be good fishing-grounds undiscovered. I think there are.

2703. I do not know anything of the fish in the Arthur River.

2704. I think there are plenty of fish in Macquarie Harbour if proper appliances were used there for their capture.

2705. I have seen the mouth of the Gordon fairly alive with young fish coming down. This was, I think, at the latter end of winter.

2706. Pelicans are numerous there, and they feed on the young fish.

2707. *By the Chairman.*—While sailing on the West Coast I have dipped up buckets-full of small fish like English sprats. This was in the barracouta season.

2708. *By Mr. Johnston.*—The barracouta appeared to be feeding on them.

2709. Following the horse-mackerel the shark and kingfish appear.

2710. Sharks appear in schools, the same kind as those caught in Recherche.

2711. I have heard persons talk of starting a shark industry there.

#### THURSDAY, 24TH AUGUST, 1882.

*Present*—Matthew Seal, Esq., *Chairman*, John Swan, Esq., Curzon Allport, Esq., A. G. Webster, Esq., R. M. Johnston, Esq., A. Riddoch, Esq.

MR. ALLAN M'CALL, *Manager of the Tasmanian Preserving and Trading Company, examined.*

2712. *By the Chairman.*—My establishment is adapted for the purpose of fish preservation.

2713. I have not had any experience as to the market for fish in the other Colonies, but am quite willing to try an experiment here.

2714. I have thought of trying the preservation of kingfish. I have the permission of my Directors to get a small quantity as an experiment.

#### REPLIES TO QUESTIONS, BY THE HONORABLE ALEXANDER M'GREGOR, M.L.C.

1. How long have you been engaged in the whaling industry? Twenty-five years.

2. How many vessels are now (August, 1882) employed out of Hobart,—their tonnage, number of crews? Seven vessels are now employed out of this port,—the tonnage of same being 2118, and their crews numbering 211 men.

3. The Statistics show that there has been a gradual declension in the number of vessels employed. Do you attribute this to the scarcity of whales; to the diminished value of oil; or to the absence of skilled men as officers for the ships; or to all these causes combined? All the causes enumerated, especially the difficulty in obtaining skilled officers.

4. Do you look for any revival of this industry; and if so, upon what grounds? At the present time there is no prospect of a revival of the industry.

5. What are the present market values (August, 1882), in Hobart, of sperm oil, black oil, and whalebone? Sperm oil, £65 per tun; black oil and whalebone—none being now procured, I cannot give value.

6. Are the present values remunerative, with average takes? An average take of late years would not be remunerative. To make a voyage payable, a vessel must obtain not less than five tuns per month, at present value.

7. Are present values, in your opinion, likely to be maintained? Yes, with occasional fluctuations of a few pounds per tun.

8. Can you give the probable value of the catch for the present year? The probable value of the catch for 1882 is £20,215. I compute this valuation by quantity of oil already landed, which is 171 tuns; and to arrive, 140 tuns,—together 311 tuns, at £65 per tun.

9. Have you any suggestions or recommendations to offer as to the improvement, &c. of this fishery? I would recommend that more protection should be afforded by legal enactment, and also by Government subsidies, as I consider that the whaling vessels are serving as Reformatories for the Colony.

#### STATEMENT OF MR. WILLIAM TAPNER, TRIABUNNA.

William Tapner, of Triabunna, states :—I have been employed in fishing and oystering for 27 years, and during that time have been constantly employed on the fishing-grounds of the East Coast.

*Crayfish.*—These are found all along the rocky coast, and can be had all the year round. The best time is May, June, and July. They spawn all the year round; and I am of opinion that the great decrease in them is due to their being taken indiscriminately, and think that the young or small crayfish ought to be protected, and also the female fish. The female is easily distinguished from the male by having double claws on the two back legs.

*Oysters.*—I have had plenty of experience, and am of opinion that there are several reasons for their decay along the coast :—1. The indiscriminate fishing, and in throwing their culch into heaps instead of distributing it regularly along the beds, as the spawn often attaches to them in considerable numbers. During last season I found an old oyster shell with spat attached to it. I counted the number, and there were 290 spat on this one shell. I took it in about 8-fathom water. This year I have frequently noticed culch with 50 or 60 spat attached to one shell, also in deep water. 2. Shifting oysters at improper times for breeding purposes. Oysters should not be removed during October, November, and December, as they are in the height of spawning; and very few survive a removal at that time of the year. 3. The natural enemies are the stingaree, crabs, star-fish, and *bêche-de-mer* or sea-slug, the most destructive being the stingaree, as it lies over such a body of the young stuff, crushes, and then eats it. 4. Disease.—I have noticed a disease amongst oysters, and wherever I have noticed it on an oyster-bank the bank was sure to die out for a time. I am, however, of opinion that those banks recover after a time; and I also think that the beds now dead, or apparently so, will all recover again in time if the culch is not dredged up and left in heaps, as has been done in some places, even as deep as three or four feet; whereas if it was spread about thousands of young oysters would attach to it.

I am of opinion that if every oysterman was allowed to have an artificial bed of, say, two acres, it would greatly help the culture and preservation of the oyster, more particularly in conserving the young oysters, as oystermen take so little interest in the young oysters they may take while fishing; but if they had a bed to put them on they would take care of them for their value. If some of the beds that have died out were devoted to that purpose they would be the best, as the young oysters would thrive better there, and in so doing would help to reclaim the old ground about them.

*Oysters in deep water.*—I am of opinion that there are plenty of oysters in deep water which might be fished for if sufficient encouragement were given, as it would be a most expensive proceeding. Perhaps if licences were granted for prospecting in certain localities, with the right of search for a limited time, and a right of lease of all beds discovered in a certain depth of water, it might be an inducement for persons to go to the expense to dredge in deep water. I myself have discovered oysters in deeper water than has ever been known here before, viz., 8 fathoms. To do this I had to obtain a small vessel and expensive gear, and, according to the present law, I had no protection when I found them from any person who held an oyster licence fishing the grounds had they known of my success. I have, in searching for oysters along the coast, found them in water as deep as 13 fathoms. I am of opinion that there are different descriptions of oysters along the coast, so different as to be recognisable from one another by experienced persons. A cultivated oyster is easily told from one on a natural bed.

I have an artificial bed, and have had it three or four years, viz.—two acres in Spring Bay, opposite my residence. I find that Spring Bay oysters do not grow so fast on it as oysters brought from other places; and the same thing occurs with them if taken to other waters—they grow faster than the native oysters there. I have proved that by bringing oysters 40 and 50 miles to the bed, and shifting them at the proper time. Oysters brought out of deep water and put in shallow grow much quicker than those taken out of shallow water.

#### CORRIGENDA.

Answer 235. For "rod and line" read "hook and line."

— 1556. For "when feeding" read "which were feeding."

— 1573. For "small anchovies" read "small bright fish like anchovies."

— 1587. Second line, omit "flounders" and read "I know flounders to be in that bay, but I have not fished for them."

## APPENDIX A.

## FISH MARKET REGULATIONS.

SITUATE in Dunn-street, within the limits of the New Market. Shall be managed by the Clerk of the New Market. It shall be opened and closed by ringing a bell; and shall commence at 6 o'clock in the morning throughout the months of October, November, December, January, February, and March; and 7 o'clock in the morning during the remainder of the year (Sundays and holidays excepted); and no fish shall be sold there after sunset.

1. All fish intended for sale in Hobart must be brought to this Market, and there sold.

2. Every person bringing fish for sale shall, before commencing to land the same from the boat or vessel in which the same is brought, pay to the Clerk of the Market, for each boat of a size not exceeding a whaleboat, Sixpence; for any larger size, One Shilling; which shall entitle him to a standing in the Market for the display and sale of such fish.

3. All fish brought into the Market for sale which the Clerk of the Market shall consider unwholesome and unfit for food, shall be forthwith seized and destroyed.

4. That all persons intending to trade as fishmongers must obtain a ticket from the Clerk of the Market, and pay  $1\frac{1}{2}d.$  for each time he conveys fish from the Market for sale.

That no person shall hawk fish for sale without a ticket for the purpose supplied by the Clerk of the Market, and for which he shall pay  $1\frac{1}{2}d.$ ; which ticket shall entitle him to hawk fish for sale on the day the same is issued, and not otherwise.

The term fish shall be taken to mean every description of fish and shell-fish, except such salted, dried, smoked, preserved, or pickled fish as may be imported.

Nothing contained in the preceding Rules shall be deemed to set aside or contravene any Bye-law made by the Municipal Council in pursuance of any Act.

By order of the Municipal Council,

HENRY WILKINSON, *Town Clerk.*

*December, 1873.*



## APPENDIX B.

*RETURN, by Mr. JOSEPH BARNETT, showing the Number of Boats engaged in Fishing from Hobart, classified, Names of Owners, and Numbers of Crews.*

<i>Owners.</i>	<i>1st Class, Decked well-boats engaged deep sea fishing.</i>	<i>2nd Class, Large open well- boats, deep sea fishing.</i>	<i>3rd Class, Well-boats used for seining and river fishing.</i>	<i>Total Crews, 2 men to each Boat.</i>	<i>Total Boats.</i>
Mr. Barnett .....	4	..	4	16	8
Mr. Davis .....	..	5	2	14	7
Mr. T. Turner .....	..	2	..	4	2
Mr. T. Rush .....	..	1	..	2	1
Mr. F. Rush .....	..	1	..	2	1
Mr. Hull .....	..	2	1	6	3
Mr. T. Ikin .....	..	..	2	4	2
Mr. W. Ikin .....	..	..	1	2	1
Mr. Free .....	..	..	2	4	2
Mr. Potter .....	1	..	..	2	1
Mr. Gates .....	1	..	..	2	1
Mr. Cross .....	1	..	..	2	1
Mr. Smith .....	..	1	..	2	1
Mr. Barber .....	..	..	2	4	2
Mr. Roberts .....	..	1	..	2	1
Mr. Hadley .....	..	..	2	4	2
Mr. Rowe .....	..	..	1	2	1
Mr. Mazey .....	..	1	..	2	1
Mr. Andrews .....	..	..	1	2	1
Mr. Milligan .....	..	..	1	2	1
Mr. Thompson .....	..	..	1	2	1
Mr. Whitehouse .....	..	..	1	2	1
Mr. Hinsby .....	..	1	..	2	1
Mr. Howard .....	..	..	1	2	1
Mr. Miles .....	..	..	1	2	1
Mr. Chambers .....	..	..	1	2	1
Mr. King .....	..	..	1	2	1
Mr. Adlard .....	..	..	1	2	1
Mr. Veal .....	..	2	..	4	2
Mr. Hartley .....	..	..	1	2	1
Mr. Martin .....	..	2	..	4	2
TOTALS .....	7	19	27	106	53

## APPENDIX C.

*RETURN showing Quantities and Values of Fish exported from Hobart by Mr. JOSEPH BARNETT from the Years 1872 to 1881 inclusively.*

<i>Names of Fish.</i>	<i>1872.</i>	<i>1873.</i>	<i>1874.</i>	<i>1875.</i>	<i>1876.</i>	<i>1877.</i>	<i>1878.</i>	<i>1879.</i>	<i>1880.</i>	<i>1881.</i>	<i>Total.</i>	<i>Average.</i>
Trumpeter ( <i>Latris hecateia</i> ) .....	Doz. 77	Doz. 82	Doz. 63	Doz. 37	Doz. 40	Doz. 47	Doz. 55	Doz. 84	Doz. 13	Doz. 23	Doz. 521	Doz. 52.1
Perch ( <i>Chilodactylis macropterus</i> ) .....	20	27	159	119	124	101	70	154	41	114	929	92.9
Travally ( <i>Neptonemus brama</i> ) .....	..	8	12	28	31	197	9	107	6	..	398	39.8
Barracouta ( <i>Thyrsites atun</i> ) .....	1054	404	954	428	736	917	1381	139	1440	1146	8499	849.9
Kingfish ( <i>Thyrsites solandri</i> ) .....	1023	981	1316	2405	1037	503	503	126	20	5	7924	792.4
Eels ( <i>Conger vulgaris</i> ) .....	33	28	40	38	52	44	19	31	18	27	330	33.0
	2207	1530	2544	3055	2020	1714	2037	641	1538	1315	18,601	1860.1
Crayfish ( <i>Palinurus Edwardsii</i> ) ..	1600	1947	2861	2175	2880	2322	2248	1936	1668	2292	21,929	2192.9
Estimated value of fish .....	£ 593	642	1065	1082	987	941	1008	616	503	604	8041	804.1



APPENDIX D.

STATEMENT showing the Value of Fish sold in the Market, Hobart, for Local consumption, as recorded by Mr. JOSEPH BARNETT, during the Year 1881.

	£	s.	d.
January .....	281	12	0
February .....	305	6	0
March .....	324	10	9
April .....	202	4	6
May .....	202	6	6
June .....	190	12	3
July .....	191	5	6
August .....	168	9	9
September .....	224	10	9
October .....	211	11	6
November .....	238	2	6
December .....	181	9	3
	£2722	1	3

APPENDIX E.

[Extracted from Statistics of Tasmania, 1881.]

DECENNIAL Return showing the Number, Tonnage, and Crews of Tasmanian Vessels engaged in the Whale Fisheries; also the Number and Tonnage of such Vessels entered Inwards, and the Quantity of Oil, &c. which they brought into Port.

Year.	Vessels employed.			Vessels entered Inwards.		Produce brought into Port.			
	No.	Tonnage.	Crews.	No.	Tonnage.	Black Oil.	Sperm Oil.	Whalebone.	Value.
						tuns. galls.	tuns. galls.		£
1872 .....	19	4917	488	12	3070	14 18	339 0	—	27,420
1873 .....	18	4765	444	18	4642	13 18	558 0	—	44,000
1874 .....	16	4088	389	13	3405	—	342 0	—	30,780
1875 .....	13	3525	315	6	1628	—	139 28	—	12,465
1876 .....	13	3525	315	15	3955	9 126	470 0	—	41,740
1877 .....	12	3295	324	11	3054	—	451 126	—	31,605
1878 .....	11	3156	321	11	2733	—	282 0	—	16,920
1879 .....	11	3156	326	8	2317	—	268 126	—	13,425
1880 .....	10	2780	296	4	1158	—	219 0	—	12,045
1881 .....	10	2780	296	8	2497	—	316 0	—	22,120

E. C. NOWELL, Government Statistician.

APPENDIX F.

REVENUE derived from Sale of Ova and Fishing Licences from Years 1877 to 1881 inclusive.

Sale of Ova.				Fishing Licences.					
Year.	Amount.			Season.	No. of Licences.	Amount.			
	£	s.	d.			£	s.	d.	
1877.....	100	0	0	1877-78.	..	105	10	0	
1878.....	86	0	0	1878-79.	177	129	0	0	
1879.....	90	0	0	1879-80.	312*	156	0	0	
1880.....	105	0	0	1880-81.	382	191	0	0	
1881.....	187	10	0	1881-82.	408	204	0	0	
	568	10	0			785	10	0	

\* Fee reduced to 10s.

PHILIP S. SEAGER, Secretary Salmon Commissioners.

## APPENDIX G.

*RETURN of the Distribution of Ova and Fry (Salmonidæ), from the Breeding Ponds, River Plenty, from the Years 1869 to 1881, both inclusive.*

## OVA.

	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	TOTAL.
<i>Tasmania.</i>														
Launceston .....	1500	1600	1750	1000	7800	6800	..	..	500	..	..	..	..	20,950
Lake Echo .....	..	550	..	..	..	..	..	..	..	..	..	..	..	550
East Coast Rivers .....	..	..	..	500	..	..	..	..	..	..	..	..	..	500
Chudleigh .....	..	..	600	5100	..	..	..	..	..	..	..	..	..	5700
North-East Coast Rivers .....	..	..	..	..	..	..	..	500	..	..	..	..	..	500
Hobart .....	100	..	..	..	..	..	..	..	..	..	..	..	..	100
Vicinity Lake St. Clair :	..	..	..	..	..	..	..	..	..	..	..	..	..	..
River Dee .....	..	..	..	..	..	..	..	..	..	400	..	..	..	400
River Nive .....	..	..	..	..	..	..	..	..	..	600	..	..	..	600
Traveller River .....	..	..	..	..	..	..	..	..	..	800	..	..	..	800
Emu Bay .....	..	..	..	..	..	..	..	..	..	..	..	..	*4000	4000
Great Bend of Gordon Rr. .....	..	..	..	..	..	..	..	..	..	..	..	..	2500	2500
<i>Other Colonies.</i>														
Victoria .....	1800	3100	3300	10,000	2500	3550	3000	2250	7000	8000	11,000	14,000	12,000	81,500
New South Wales .....	..	..	..	500	250	250	250	250	3000	500	5000	2000	9500	21,500
South Australia .....	..	..	..	..	..	..	..	..	..	..	2000	5000	13,000	20,000
Western Australia .....	..	800	..	..	..	..	..	..	..	..	..	..	..	800
New Zealand .....	2600	4200	..	3100	900	800	..	250	..	..	..	2000	5000	18,850
TOTALS .....	6000	10,250	5650	20,200	11,450	11,400	3250	3250	10,500	10,300	18,000	23,000	46,000	179,250

## FRY.

Tasmanian Lakes .....	..	1000	..	..	..	..	..	..	..	..	..	..	..	1000
Swansea .....	200	..	..	200	..	..	..	..	..	..	..	..	..	400
River Derwent .....	2000	450	1000	..	..	950	..	..	..	..	..	..	..	4400
Huon .....	..	500	720	81	..	..	..	..	250	..	..	..	..	1551
South Esk .....	..	..	..	..	..	..	200	..	..	500	..	1000	..	1700
Plenty .....	1850	3140	..	..	..	200	300	750	..	1500	..	600	3500	11,840
Victoria, Huon .....	..	..	700	510	..	..	..	..	..	..	..	..	..	1210
Southport .....	400	..	400	..	..	..	..	..	..	..	..	..	..	800
River Lachlan .....	1300	1400	..	..	..	..	..	..	..	..	..	..	..	2700
Guy Fawkes Rivulet ..	200	500	80	..	..	..	..	..	..	..	..	..	..	780
Brown's River .....	200	500	..	..	..	..	..	..	..	..	..	..	..	700
Bagdad Rivulet .....	300	..	500	..	..	..	..	..	..	..	..	..	..	800
Lake Echo .....	..	..	500	..	..	..	..	..	..	..	..	..	..	500
East Coast Rivers .....	200	..	..	..	..	620	..	..	..	..	..	..	..	820
Port Esperance .....	150	..	400	..	..	..	..	..	..	..	..	..	..	550
River Jordan .....	..	..	1050	250	..	..	..	..	..	..	..	..	..	1300
Peppermint Bay .....	50	..	..	..	..	..	..	..	..	..	..	..	..	50
Port Seymour .....	100	..	50	..	..	..	..	..	..	..	..	..	..	150
Kermadie River .....	339	..	..	200	..	..	..	..	..	..	..	..	..	539
River Styx .....	800	1200	500	700	..	..	..	400	..	..	..	..	..	3600
Russell's Falls .....	..	1000	..	..	..	..	..	..	..	..	..	..	..	1000
River Ouse .....	..	..	1000	..	..	..	..	..	..	..	..	..	..	1000
Back River .....	..	..	400	..	..	..	..	..	..	..	..	..	..	400
Clarendon, Rr. Derwent ..	..	200	..	..	..	..	..	..	..	..	..	..	..	200
Woolpack, ditto .....	..	100	..	..	..	..	..	..	..	..	..	..	..	100
North West Bay .....	..	200	..	..	..	..	..	..	..	..	..	..	..	200
New Town Creek .....	..	50	..	..	..	..	..	..	..	..	..	..	..	50
Coal River .....	..	400	..	..	..	..	..	..	..	..	..	..	..	400
Hobart .....	..	..	..	..	1200	..	..	..	..	..	..	..	..	1200
Blackman's River .....	..	..	..	..	..	..	300	..	..	..	..	..	..	300
Mountain River .....	..	300	..	400	..	..	..	..	..	..	..	..	..	700
Launceston .....	..	..	..	..	..	280	..	..	..	..	..	500	350	1130
River Forth & tributaries ..	..	..	..	..	..	..	500	..	..	..	..	..	..	500
Rivers Meander & Liffey ..	..	..	..	..	..	..	..	300	500	..	..	..	..	800
River Mersey .....	..	..	..	..	..	..	..	500	500	..	..	..	..	1000
Coal River .....	..	..	..	..	..	..	..	250	1950	..	..	..	..	2200
White Kangaroo River ..	..	..	..	..	..	..	..	250	..	..	..	..	..	250
Creekton Rr., Esperance ..	..	..	..	..	..	..	..	200	..	..	..	..	..	200
Russell River .....	..	..	..	..	..	..	..	500	..	..	..	..	..	500
Sorell .....	..	..	..	..	..	..	..	750	..	300	..	..	..	1050
Macquarie River .....	..	..	..	..	..	..	..	320	500	300	..	..	..	1120
Ben Lomond Rivulet ..	..	..	..	..	..	..	..	..	300	..	..	..	..	300
North Esk .....	..	..	..	..	..	..	..	..	1000	..	..	..	500	1500
Lisdillon .....	..	..	..	..	..	..	..	..	900	..	..	..	..	900
Prosser's .....	..	..	..	..	..	..	..	..	450	..	..	..	..	450
North West Coast .....	..	..	..	..	..	..	..	..	..	900	..	..	..	900
George's Bay and	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gould's Country .....	..	..	..	..	..	..	..	..	..	900	..	..	..	900
Dunorlan .....	..	..	..	..	..	..	..	..	..	..	300	..	..	300
Emu Bay .....	..	..	..	..	..	..	..	..	..	..	500	..	..	500
Glamorgan (5 streams) ..	..	..	..	..	..	..	..	..	..	..	450	..	..	450
Ringarooma .....	..	..	..	..	..	..	..	..	..	..	..	1300	..	1300
TOTALS .....	8089	10,940	7300	2341	1200	200	2150	2150	3070	7850	2900	2350	6650	57,190

\*These Ova were supplied to J. W. Norton-Smith, Esq., Manager V.D.L. Co., who hatched about 2500, and placed 550 fry in the Emu River, 500 in the Way, 200 in the Black, 350 in the Cam, and 300 in the Inglis.

NOTE.—Ova and fry were distributed prior to the year 1869, but there are no records of the numbers so distributed. The first trout hatched, 4th May, 1864; the first salmon ditto, 5th May, 1864.

PHILIP S. SEAGER, *Secretary Salmon Commissioners.*

# A P P E N D I X    H.

*RETURN referring to Streams, &c. in Municipalities and Police Districts in which Salmonoids have been placed.—Compiled from information supplied by the Wardens of Municipalities and the Inspector of Police.*

## M U N I C I P A L I T I E S.

<i>Name of Municipality.</i>	<i>Name of River, Creek, Lagoon, &amp;c.</i>	<i>Date when Fish first placed there.</i>	<i>Date of any additions.</i>	<i>Whether Fish increasing or fluctuating in numbers.</i>	<i>Whether Stream much fished by Anglers.</i>	<i>Remarks.</i>
BOTHWELL.....	Lake Crescent River Clyde River Shannon Rockford Great Lake	1868 1870	Not any	Increasing	Very little	The Warden (Mr. Allison) is of opinion that the large fish remain in the lakes, and only enter the rivers for spawning in June and July. He is led to this opinion by the fact of so few large fish being captured in the Clyde or Shannon of late years, although in the months named for about three-quarters of a mile from the source of the Shannon fish are to be seen weighing apparently from 12 to 20 lbs.
BRIGHTON .....	River Jordan Bagdad Creek  Strathallen	About 1873 About 1872  1872	.. ..  ..	None now to be found Increasing  None now to be found	 Yes  	
CAMPBELL TOWN ..	Macquarie River South Esk River	Unknown ditto	.. ..	} Supposed to be increasing	Very little	
CLARENCE .....	<i>Nil.</i>					
DELORAINÉ .....	Dairy Rivulet  Meander River  Mole Creek	About 1869  About 1870  About 1868	..  ..  ..	Increasing  ditto  No, none ever caught	Yes  Yes  	Rivulet muddy and reedy, frequented by large fish, but difficult to fish on account of reeds and timber. Considered a good trout stream, but much poached by persons professing to be fishing for blackfish.
EVANDALE.....	Strathmore Mill Race Strathmore Mill Pond South Esk River Nile River Ben Lomond Rivulet	1866 1867 1869 1869 9 November, 1878; 200 at Kelvin Grove; 100 at Kingston	1867 .. .. .. ..	Increasing ditto ditto ditto ditto; large fish seen last season	Very little ditto A great deal Very little ditto	Mr. M <sup>c</sup> Arthur brought ova from the Salmon Ponds, placed it under the care of Mr. M <sup>c</sup> Phail, Strathmore, who hatched them and placed the fry in these streams.  Two fish only have been captured, one of 4 lbs. in 1881, and 1 of 5 lbs. in 1882.
FINGAL.....	Break o' Day  St. Paul's South Esk	} About 7 years ago	..  ..	Increasing very fast	Not much fished	
GLAMORGAN .....	Swan River Wye Meredith Apsley Meredith Lisdillon	1868 1880	December, 1880	..	Very seldom	Brown trout placed in the rivers in 1868, and nearly 400 trout placed in the Swan, Apsley, Meredith, Lisdillon, and Wye in December, 1880. One fish only has been taken, and that one in a mill-race near the Wye, previous to 1880.

GLENORCHY .....	Humphrey's Rivulet Islet Rivulet Faulkner's Rivulet Abbotsfield Rivulet Roseneath Rivulet Lower Sorell Creek	About 1870	..	Fluctuating	Not much fished	
GREEN PONDS .....	Quorn Creek River Jordan	1872	1873	Increasing. Now numerous	{ Never Only occasionally	
HAMILTON .....	Derwent Clyde  Dee Ouse Kennere Creek, Ouse Jones' River Broad Repulse Hunter's Creek	.. ..  .. .. .. .. .. .. ..	.. ..  .. .. .. .. .. ..	Decrease last year ditto  ditto ditto Increase Decrease ditto Increase	Very few Not nearly so much as in former years  Not much fished Not fished at all ditto ditto ditto	
LONGFORD .....	South Esk Lake River Brumby's Creek Blackwood Creek		1873 and 1874	Increasing	Not much	The fish are thought to be making their way up to the Lakes, as they are more abundant at the source of the Rivers.
NEW NORFOLK.....	River Derwent River Plenty  Dry Creek Lachlan Back River Sorell Creek River Styx Bushy Park Park Creek Russell's Falls	1869 1869  1869 1869 1871 1869 1869 1871 1869 1869	1870, 1871, 1881 1869, 1870, 1875, 1876, 1880, 1881  1869, 1870  1870 .. 1876 ..  ..	ditto ditto  ditto  .. ..  Increasing	Moderately A great deal  Too much fished  Not much A good deal  Not much	Fish exceedingly numerous, but not easily caught. Best fishing in upper waters.  Good fishing near mouth.  Fish very small. Good fishing near mouth.
OATLANDS .....	Nil.					
RICHMOND.....	Coal River Kangaroo River	1864 1878	1877, 1878 ..	No fish seen since placed there Increasing slowly	No No	
ROSS .....	Macquarie River	1869 or 1870	Yes, date unknown	Increasing	No	
SORELL.....	Ironstone Rivulet	7 years ago	1877	Unknown		
SPRING BAY.....	Woodstock Rivulet Tea Tree Rivulet	.. ..	.. ..	None seen since ditto		
WESTBURY .....	Meander River Quamby Brook Liffey Rivulet Brumby's Creek Piper's Lagoon	About 1870 .. About 1875 .. ..	1875, 1878 .. .. .. ..	Increasing ditto Fluctuating Increasing Fluctuating	Yes No No No No	

POLICE DISTRICTS.

Name of Police District.	Name of River, Creek, Lagoon, &c.	Date when Fish first placed there.	Date of any additions.	Whether Fish increasing or fluctuating in numbers.	Whether Stream much fished by Anglers.	Remarks.
HOBART .....	Hobart Rivulet New Town Rivulet	Unknown ditto	.. ..	No No	No No	
EMU BAY.....	River Inglis River Cam River Emu River Wye Freebrook Creek Romaine Creek	20 October, 1881 15 October, 1881 25 October, 1881 10 October, 1881 25 October, 1881 20 May, 1882	.. .. .. .. .. ..	Yes Yes Yes Unknown ditto Yes		
RUSSELL .....	Black River	1881				
FRANKLIN .....	Huon River Agnes Rivulet Mountain River Kermadie Esperance River Southport Narrows	1869 1870 1870 1869 ditto ditto	1870, 1871, 1872 .. 1872 1872 1871 1871	Increasing ditto ditto Increasing largely Not known ditto	No No No No No No	Salmon trout and brown trout.
KINGBOROUGH.....	Creek, Great Oyster Cove Creek, Peppermint Bay Creek, Brown's River	About 1870 About 1872 Not known	.. .. ..	No No No	No No No	
SELBY .....	South Esk, Beams' Ford ditto, Dalrymple Bend ditto, Third Basin North Esk, Ivory's Bight ditto, Albion Mill Distillery Creek St. Patrick's River  Supply River	November, 1869 ditto ditto ditto ditto January, 1869 ditto  October, 1873	.. 1870, 1871 1873, 1874, 1875 1881 1874, 1880, 1881 1874 1874  1874	Increasing Parts decreasing .. Decreasing ditto ditto ditto  No reliable information; it is thought fish have not done well	Much fished ditto ditto ditto ditto Not much fished ditto	Fish as a rule red and firm. Good for table. Shaped as North Esk fish. Handsome well-shaped fish, and game. Not so good for table as South Esk fish. Poor fish for table, ill-conditioned and shapeless. Handsome bright coloured fish, but tasteless; decreasing rapidly, cause unknown; once a good river, now not worth fishing.  <i>Note by Mr. Superintendent Propsting.</i> —During the past season many fish have been found dead in the North and South Esk and Meander Rivers, showing no external injury, and apparently in good condition—as a rule all large fish.
GEORGE TOWN.....	Little Forester River	About 1871	Unknown	Unknown	No	
PORTLAND .....	George River Powell's Rivulet Groom Creek Ransom Creek	} 1869	.. ..	ditto	No	

CARNARVON .....	Nil.					
SOUTH LONGFORD ..	Great Lake	December, 1870	None	Rapidly increasing	Not much	Trout have been seen in the River Ouse about three miles from Great Lake, having worked up from other districts or from the Derwent. No trout have yet been seen in any of the creeks flowing into the Great Lake, although no doubt they will in time go there to spawn. The great breeding stream for the Lake is the Shannon from its source to the Lagoon, about a mile, where hundreds of trout can be seen in the end of June and beginning of July.
RINGAROOMA .....	River Brld	1876	ditto	Slightly increasing	No	
	River Forester	ditto	ditto	None to be seen	No	
	Carry's Brook	1881	ditto	None seen yet	No	
	Creek at Mr. Krushka's farm					
	French's Creek					
	Maryvale Creek	November, 1881	ditto	Supposed to be increasing	No	
	Branch of Ringarooma River	ditto	ditto	ditto	No	
PORT SORELL.....	River Gawler	1875	ditto	None have been seen	No	
	Clayton's Rivulet	ditto	Yes, date unknown	Increasing	No	
	Button's Creek	ditto	ditto	ditto	No	
	Green's Creek	1870	..	ditto	No	
	Rubicon River	1880	ditto	ditto	No	
	Mersey River	1879	..	ditto	Yes	

PHILIP S. SEAGER, *Secretary to Salmon Commissioners.*

## APPENDIX I.

*To the Royal Commission on the Fisheries of Tasmania.*

GENTLEMEN,

WE, the undersigned, feeling an interest in the protection of the nurseries of the River Derwent against netting, and its maintenance as a fishing-ground for anglers, beg to submit for your consideration the following proposals, and trust you may deem them worthy of recommendation when forwarding your Report to the Government:—

1. That we view with apprehension any movement for throwing the River Derwent open to seine and other net fishing, feeling assured that such a measure would be a death-blow to angling in that river, and thus deprive a very large portion of the community of their favourite and, to many, profitable recreation, and would tend to the deprivation of the public of a large amount of fish.

2. That we are desirous of the present restrictions as to seine-fishing in the Derwent being strictly adhered to.

3. That for the protection of the numerous anglers who frequent the Domain, the various wharves, and the bays on both sides of the Derwent, and whose sport is considerably interfered with, if not totally destroyed, by the unrestricted use of the graball and mullet-nets, we are desirous that the limit for fishing with graball, mullet, and nets other than the seine be extended from the present boundary (that is to say, from the southern side of Gielston Bay to the northern point of Cornelian Bay) to a line drawn from Kangaroo Bluff to Perry's Point. And we respectfully submit that such partial extension is not of sufficient magnitude to interfere with the privileges of persons using those nets either for profit or for pleasure.

4. That we would respectfully recommend the appointment of two extra water-bailiffs, as it is quite impossible for any one man to exercise supervision over so large an extent of water.

And we are induced to make these representations and proposals from the following considerations:—

That the fish, notably the mullet (one of the best of our native fishes both for table and sport) are only now beginning to recruit from the wholesale slaughter by netting, which, prior to the closing of the river, threatened their annihilation and the extinction of the sport of angling.

That the number of anglers is annually considerably increasing with the improvement of the sport.

That such improvement is confined to that portion of the river in which netting of every description is wholly prohibited, and that the bastard trumpeter, perch, and other fish, once so plentiful and remunerative to the angler along the Domain and in Kangaroo Point and other bays, are becoming scarcer and less productive of sport every year.

*[Signed by 295 persons. Duplicate signed by 49 Fishermen, giving names of their boats.]*

## APPENDIX J.

*Elizabeth Bay, Sydney, 15th June, 1882.*

SIR,

I BEG to acknowledge the receipt of your letter of the 8th instant, enquiring, for the information of the Royal Commission on Fisheries of Tasmania, to what extent the recommendations of the Sydney Commission have been carried into effect by law, and with what result.

In reply, I beg to state that an Act was passed by the Legislature in the early part of last year for the regulation of the fisheries, and that many of the recommendations of the Fisheries Commission of the previous year were embodied in it. These were chiefly enactments to prevent the unnecessary and aimless destruction of the spawn and young of the useful fishes, and comprised clauses limiting the size of the mesh in nets, and prohibiting the sale of fish under a certain size or weight. Power was also given to close altogether from net-fishing, from the 1st of April to the 30th of September in each year, such fishing-grounds as might be deemed desirable. This close season was selected because some of our best fishes, such as mullet, whiting, garfish, &c. spawn in April in the shallow bays and inlets of the coast, where the ova are almost certain to be destroyed wherever the seine-net is used during the winter months.

A Commission was, soon after the passing of the Act, appointed by the Government for the purpose of carrying out the intention of the Act, and of generally looking after the fisheries of the Colony.

The Commission consists of five Members, of which I am President. The very short time which has elapsed since the Act was brought fairly into operation is insufficient to enable me to speak of results, but I believe that a few months more will enable the Commissioners to speak with certainty of the efficacy of their management. In the meantime the Commissioners have been endeavouring to get together, for the education of those engaged in fishing, examples of all the best appliances for fishing used in other countries; thus, there are now in the rooms of the Commissioners for general exhibition, beam and otter trawl-nets from England, and drift herring-nets from Scotland; ground-lines and glass buoys, floats and baits from Norway; a Bulton and purse-seine from America; besides trammel-nets and other appliances for fishing. The Commissioners have also given some attention to ascertaining the best means

of utilising for food such of the fishes of the country as visit the coast in enormous shoals, and for a very limited time only, and which are captured in quantities far in excess of any possible immediate demand. The fishes around Port Jackson which are best known as annual visitors in this way are mullet, tailor, mackerel, and herring. I cannot say, however, that the efforts of the Commissioners in this direction have been as yet attended with success.

The subjects of fish culture and the acclimatisation of fish have not yet been touched by the Commissioners, though, no doubt, they are of extreme importance.

I send you by post to-day, in a pamphlet form, the Fisheries Act of New South Wales, with all the regulations made for its more effective working.

I have the honor to be,  
Sir,

Your most obedient Servant,  
WILLIAM MACLEAY.

MATTHEW SEAL, *Esq.*

## APPENDIX K.

*GENERAL Observations, with special reference to the Preservation and Development of our Fisheries, and Suggestions as to the best means to effect that end.*

### TABLE CAPE.

THERE are a great variety of fish in the vicinity of Table Cape that I have never seen before, although I have been fishing and coasting round Tasmania for 23 years.

E. STUTTERD.

### BURNIE.

1. *Herring*.—Nobody should be allowed to use nets. They are our best fish.

2. *Blackfish*.—The same restriction should be had, and a season only from December to April allowed in Nos. 1 and 2.

3. *Trout*.—Is a small native species; should be classed with the other two. All these species are to be found in the Emu, Blyth, Leven, Forth, Cam, Inglis, and most of the Coast rivers which I am not acquainted with. Oyster-beds might be found to advantage in some of these rivers.

No tench or pike should be introduced in any of these rivers. A few English trout have been introduced in most of the rivers, but it is hardly known yet how they have succeeded.

Every encouragement possible should be given to persons wishing to form oyster-beds.

In reference to the salt-water fish, they are very plentiful at times, but seem to go into deep water if weather rough.

There is no protection required in this class, as there is no wholesale fishing going on. The Coast is badly supplied with fish,—very few fishermen, and very irregular in going out.

I believe there are a few other kinds than those I have mentioned, but of which I know nothing, and seem to be scarce in this locality.

I have not included the shell-fish, of which there are many species, but very few eatable.

Then there are a great many of the voracious species, such as sharks, dogfish, stingray, octopus, toadfish, cuttlefish, and many other varieties which I know little of.

WM. H. OLDAKER.



## TORQUAY.

*Mullet.*—The nets used by fishermen on this Coast are of such a small size in the mesh that the fish caught are so small that great numbers are annually destroyed before being big enough for any practical use. I would suggest that a standard size of mesh be fixed by Government of, say, not less than one inch and a half, which would be quite small enough to hold fish of a proper size for market. Garfish, being so much smaller than the other fish, would need a much smaller net than the others, and it would be necessary to allow a smaller-sized net to be used, that is, about thirty yards of half-inch mesh in a net of one hundred yards long, which would allow other fish to escape.

These remarks are intended to apply to all the fish mentioned in the other column.

WILLIAM CHAPMAN.

## RIVER TAMAR.

*Flounders.*—I would strongly urge upon the Commission the necessity of having a close season for the flounder. The law which forbids the sale of fish under a certain size appears useless for their protection. From my own experience I find that numbers of very small fish, some not larger than an old penny, are brought in by the net, and taking every pains it is impossible to return the majority of them to the water alive, as a very few minutes' exposure kills them. The fishermen do not and cannot take this trouble, and, when the net is hauled ashore, frequently sort their fish and leave the others to die where they lie. Having a close season would not interfere to any great extent with the fishing for mullet and fish of that description, as the flounder is caught in such very shallow water—regular mud-scraping, and as it would be impossible to close certain parts of the river, such as West Arm or Nelson's Shoals, as breeding grounds without having some person employed to prevent poaching. I think if the sale of, as well as fishing for, flounders was prohibited during a certain part of the year, it would have the desired effect of protecting this most valuable fish.

THOMAS BARNARD.

*Flounder.*—This, the most valuable and highly esteemed of our indigenous fish, at one time abounded in the Tamar. I have heard of 150 dozen large fish being taken in two consecutive shots of the net. This was 30 years ago. For some years past the fish have been scarce: in fact, it almost disappeared out of the Tamar, and the fishermen had to go round to Port Sorell for them. A fair-sized fish would then bring 9s. per dozen at the boat's side. Latterly, however, the fish have re-appeared, and the fishermen report they are nearly as numerous as formerly. Protection by close season would doubtless tend to increase the numbers. This would be difficult to carry out, as they are so liable to be taken when seining for other fish; and, being so much esteemed, there would be no difficulty in disposing of them. A short close season of about two months, with heavy penalties, might possibly answer.

*Oysters.*—At one time were very plentiful from Egg Island, about 20 miles from Launceston, to the Heads. They, however, suddenly died out. The fishermen have some queer theories of their own to account for this, but none that appear to me probable. They describe the beds as at one time presenting the appearance of a well kept garden: now there is nothing to be seen but a mass of rusty shells. There are some miles of flats between George Town and the Heads which present material facilities for the formation of beds.

RICH'D. F. IRVINE.

## GEORGE TOWN.

The fishermen recommend that no seine-fishing be permitted for at least 3 years above Middle Island to Point Effingham. After that period seine-fishing should be allowed for 6 months in the year; also, that not less than  $1\frac{1}{4}$ -inch mesh be used,—when made to be  $1\frac{1}{2}$ -inch mesh, as, when tanned, it shrinks to  $1\frac{1}{4}$  inches. I believe this would be the best means of preserving the fisheries of the Tamar River, as I have always thought that the meshes of the nets now in use are too small; and the continual dragging of seine disturbs the spawn, and destroys large quantities of small fish.

I would recommend the closing of the river from Launceston to Point Effingham, and across the river to Anchor Point. This would include the river extending from Port Lempriere to York Town, which is about 2 miles in length and from a  $\frac{1}{4}$  to  $\frac{1}{2}$  mile in width, abounding in bays and inlets, and good bottom, and is a favourite spawning for all fish,—there being nothing to disturb them except the natural enemies.

The net used for catching garfish being  $\frac{3}{4}$  inch I mainly attribute so many of these small fish being brought to market. If the  $1\frac{1}{4}$ -inch mesh was adopted as the smallest size allowed to be used, these fish, which are of good quality and favoured for the table, would grow much larger.

JAMES RICHARDSON, S.M.

## RINGAROOMA.

Bridport, 31st July, 1882.

SIR,

I HAVE the honor to inform you, in reply to your circular of 20th March last, that there are no boats employed in the sea fisheries on any part of the coast in this, the Ringarooma District. A few flathead and rock-cod caught by the craftsmen trading between Launceston and Bridport, with hook and line, and for private use, are the only fish ever seen here. There are a few bream in the Great Forester River, which is a stream apparently well suited for bream, but I have seen none caught during the fourteen months I have resided here.

I may mention that, in my opinion, netting for bream should be altogether prohibited, or only allowed for a very short time during each year.

Whilst I resided at George's Bay on the East Coast, the bream at Scamander River near Falmouth, and at Anson's River, Bay of Fires, were recklessly netted in large quantities by a Chinese fisherman, and much injury done to the fishery in each place by the destruction of fish at all times and in all stages of their growth. In one season I recollect over 200 dozen bream being taken by the man referred to in less than a fortnight, from the Scamander; and he also took  $3\frac{1}{2}$  tons of bream in six weeks from Anson's River; and all these last were wasted, as, owing to some defect in the curing, they became unfit for food before they could be disposed of. I think there should be a close season for bream, as for trout; and that they should be taken only with the rod in the rivers.

I may mention that the valuable fish, the trumpeter, has been caught near George's Bay, and also near Hummock Island, in the eastern end of Bass' Straits; and it is probable the habitat of this excellent fish is not so restricted as is generally supposed. Systematic deep-sea fishing all round the coast of Tasmania would probably prove the existence of this fish in quantity in many places not now thought of. I believe some very fine trumpeter have been taken on the South-West Coast as far round as Macquarie Harbour.

I have found numerous shells of oysters adhering to the rocks at Bridport; and many shells are constantly cast up on the shore of Anderson's Bay,—indicating the existence of an oyster-bed in the vicinity. George's Bay appears to be a very suitable place for experiments in oyster culture. Some excellent oysters were obtained two or three years since in the bay, but they were all dredged out. More than thirty years ago oysters were plentiful in the same locality; and I have found numerous young oysters adhering to timber that had been some months submerged on a mud bottom in about two fathoms of water.

I collected a great deal of information respecting oyster culture some three years since, with a view of experimenting at George's Bay, but circumstances prevented my carrying out my intentions.

When Captain Stanley formed his Oyster Company, I asked Mr. Dawson, of George's Bay, to call the attention of the Promoters of the Company to the facilities afforded at George's Bay for oyster culture, but the Company decided to commence operations at Oyster Cove.

Crayfish abound at George's Bay Heads.

Although not coming within your range of enquiry, which appears to be confined to sea fisheries, I may state that very fine blackfish are caught in several of the rivers of this district, and also remarkably large lobsters. I have heard of some in the Blue River weighing nine pounds. English trout have been introduced into the Ringarooma and Brid rivers, but I have heard of none being caught.

I have, &amp;c.

MATTHEW SEAL, Esq.,  
Chairman of Fisheries Commission, Hobart.

A. K. CHAPMAN.

## GEORGE'S BAY.

*Flounders, Bream.*—I have heard that nets with small meshes have been used in the Scamander River, whereby great quantities of fish have been destroyed that are really too small for the market; and I am under the impression that some legislation is necessary to prevent fishermen from using nets with meshes less than 3 inches.

*Oysters.*—With regard to oysters, I may state that as yet only one oyster-bed has been found that has supplied any quantity of oysters for the market, and the first year of its discovery it was so much fished that last year hardly an oyster could be caught. I therefore think that in the absence of any other oyster-beds being found, it would be advisable to restrict any fishing on the said bed for at least two years.

Within some few miles outside the Heads of George's Bay some fine real trumpeter are caught, which are forwarded generally by a craft to Victoria, but when the weather has been unfavourable the boats have put into George's Bay and disposed of the fish. As far as regards injury to the fishing in the Bay from boats from other parts I may say the injury is *nil*. Crayfish abound outside the Heads, and great numbers are caught occasionally, but mostly by inhabitants who go out expressly for a pleasure trip.

W. L. BOYES.

I would strongly urge that some measures be taken to preserve the bream, more especially in the Scamander and other rivers throughout the Colony, as it is now the custom for Chinamen to locate on the rivers in this district and sweep out with their small-mesh nets hundreds of dozens of small bream. I have seen several lots not exceeding 3 inches in length. This destruction I regret to say is not confined to the Chinese, but lots of people use the small-mesh nets to get the small fish.

HENRY DAWSON, *St. Helen's, Portland.*

### SEYMOUR.

*Real Trumpeter.*—The fishing-ground for real trumpeter is about four miles from the Coast, between Piccanini and Seymour, about five miles in length. They are caught by hand lines baited with crayfish; the depth of bottom averages from twenty to sixty fathoms. Some time since there were three Melbourne vessels fishing for trumpeter principally, but now there is only one—the *Rachel Thompson*—which is assisted by small boats to make up her cargo. The Hobart boats sell their fish to the Melbourne boats. Some time ago there were several small boats from Hobart, but not so many now,—only three or four. Seymour is considered the finest trumpeter ground of Tasmania.

Other fish are caught within two hundred yards from shore, and are very plentiful.

— COOPER.

### SWANSEA.

THERE are no regular number of boats employed on these grounds. The boats from the Seymour and Bicheno grounds give an occasional call. Last year (September 1881) we had as many as nine that I know of fishing here. Three ketches—*The Dagmar, Alice Maud, and Rachel Thompson*; two yachts—*Foam and Enchantress*; and four open well-boats.

Since then I know that two of these vessels have left the occupation, viz., the *Alice Maud* and the *Enchantress*.

FRANK M. GILL.

\* \* \* \* \* Spring Bay is the head quarters of fishermen, Hobart their market. They have been wont to gather there oysters for Hobart many years. I do not believe any other fish than oysters have been destroyed, nor are the other fish capable of being destroyed by all the inhabitants of Tasmania combined. The fishermen from Victoria have the credit of destroying the only considerable oyster-bed known to exist in Oyster Bay (in Meredith's Fishery Bay). A Chinese Fisher Co., for Melbourne, cleaned up all the mutton-fish (Venus' Ear), and sent many tons of crayfish and all other fish they could catch (smoke-cured).

Victorian fishing craft fish the trumpeter banks off Seymour, and indeed all the East Coast. It is hardly fair that they should catch the good fish in the cold waters off these coasts and pay no fee; but I think it ridiculous to talk of their destroying all the fish in the sea. I have heard fishermen tell of the greediness of some who fill their wells here at the Schoutens with "silver trumpeter" so full that they die, and so "play the devil with the silver-bellies, and make them scarce." It is nonsense.

Year after year, in autumn and early winter, I have seen shoals of fish,—a little shipload in each,—as far as the eye could reach, and all going north. I have seen them from the hills of the shore, from Survey Hill, in the centre of Schouten Island, or from "Schouten Peaks," from the look-out at Cockle Bay, Cape Bernier, south end of Maria Island, and, for anything I know, they may reach to the south pole. These are mackerel (and fat),—and salmon and mullet are about as plentiful; then barracouta and kingfish are exceedingly numerous; and put a graball down where you will in "bell-rope" kelp, more silver trumpeter will get in than any other fish. Silver and black perch are plentiful, and real trumpeter, when you get among them; and crayfish in all rocky coasts are innumerable. I do believe if all the inhabitants of the island tried to kill all the fish in the sea they could not begin to do it. Nevertheless, they ought to be made to take them at the right time.

The shoals of mackerel making north have always gone up outside Schoutens, and run on the beaches there in dark nights, very rarely this side the bay. The last three years they have missed their way, come inside, and gone up Swan River, turned north up Moulting Bay (7000 acres mud-flat), and run aground in cartloads at the head of it. \* \* \* \* \*

Howsoever barbarously fished, the oysters in Spring Bay (their head quarters on East Coast,) were principally killed by a tidal wave bringing in a vast accumulation of weed, and settling down over the beds and rotting on them. \* \* \* \* \*

EDWARD O. COTTON.

## BICHENO.

*Trumpeter and Crayfish.*—I do believe the visits of the Victorian boats are in opposition to the interests of our boats (Tasmanian), for I notice that the grounds soon get thinned. The ground off Seymour, although comparatively a new one, has been quite forsaken this last season on that account, the boats working move up off St. Helen's. The above relates to crayfish as well.

H. HARVEY.

## GLAMORGAN.

Two Melbourne vessels, with shore boats, take large numbers of various kinds of fish—especially crayfish—from the East Coast to their own port every season, contributing nothing to our revenue.

The Oyster Bay oyster-beds are nearly destroyed by vessels from the neighbouring Colonies over-dredging them.

J. LYNE, *Warden, Glamorgan.*

## SPRING BAY.

*Oysters.*—In reference to granting leases of grounds for oyster-beds, I would suggest that applicants should be allowed to select their own grounds, for if they have had experience they would know the ground most suitable for oysters. I am also of opinion that there are plenty of oysters in deep water along the coast; and if sufficient encouragement was given in the way of protection to persons discovering oyster-beds in water of over 10 fathoms, new beds might be discovered. I am also of opinion that it requires practical experience amongst oysters to enable persons to select oysters to put on a natural bed, as the various beds of oysters in this colony have often very different characteristics.

WILLIAM TAYLOR, *Spring Bay.*

*The Oyster.*—This being the principal fishing along the coast, requires careful investigation to ascertain the cause of the falling off. I am afraid it has been, like most industries, "killed by protection," as the oyster was more abundant when there was no protection than at present. At that time 14 or 15 boats used to be at work in Spring Bay, whilst now there is not one, nor has there been to any extent for the last 12 years. The same obtains at Little Swanport and Great Swanport. The only legislation that would be of real value would be a strong protection to any boat or large craft that discovered new oyster-beds in deep water, say over 10 fathoms, for it would require an expensive outfit and a powerful boat, or far better, a small steamer, to search for them, and in such an event there should be some protection for their benefit. That there are plenty of larger oysters in deep water than we have ever found in shallow is evidenced by continually finding along the beaches very large shells, especially after storms, occasionally, but rarely, with oysters in them.

*Crayfish.*—The crayfish are in such numbers that their destruction seems to be impossible; still it is a pity to see quite small fish taken in quantities to be ruthlessly destroyed. Certainly the deep-sea boats use them as food for the trumpeter they keep in the wells.

*Salmon and Mackerel.*—There seems to have been no intelligent effort ever made to endeavour to utilise the large schools of these fish which abound along the coast in winter time, being occasionally run ashore in thousands on the sandy beaches by the kingfish when the moon is young; my own idea being that they follow the moon, as it is always in the first half they come ashore.

JOSEPH MCCLUSKEY, *Spring Bay.*

*Oysters.*—I am of opinion that the decay in the oyster-beds is the denudation of the beds for the purpose of making lime, &c., when a great deal of young culch was burnt; and in fishing for oysters the young culch was taken away for the purpose of sale, quite unsaleable, and were consequently destroyed.

I am of opinion that the ground should be let out in small allotments so that they could be attended to, say not more than two acres to each, and small culch put on, and the ground kept clear and clean. It would require fencing to protect the oysters from stingaree. No lease ought to be less than 12 years, and the lessees should be compelled to keep them worked.

I have been fishing and oystering since 1841.

JAMES WATKINS, *Spring Bay.*

## PORT ARTHUR.

*Bastard Trumpeter.*—These fish seven years since were very plentiful; but since the breaking up of Port Arthur as many as 8 and 10 boats from Hobart have been daily through the year netting these fish, and as many as 30 have been caught in each graball net, each boat carrying and using from 3 to 5 nets, and each boat taking as many as from 20 to 40 dozen to market, which has completely skinned the bay, that now in a day's fishing you might catch half a dozen fish.

*Black and White Perch and Crayfish.*—The same remarks as above apply to these fish.

*Saltwater Mullet.*—These fish are very plentiful at Norfolk Bay.

*Flounders.*—These are most plentiful at Saltwater River.

*Silver Bream.*—These fish are very plentiful in Fortescue Lagoon, ranging in size from 4 ounces to 1½ lbs., and the best bait the breast of a crow.

JOHN EVENDEN, *Carnarvon, Port Arthur.*

## FRANKLIN AND D'ENTRECASTEAUX CHANNEL.

*General observations in addition to information given otherwise.*

*Habit, migratory or otherwise.*—I deem fish to be migratory which make their appearance in particular localities at particular seasons, from fresh to salt water, and *vice versa*, or from deep sea to coast, whether for the purpose of spawning, of seeking variety of food, or more congenial climate. It is well known that our coast fish, which cannot be catalogued migratory, will occasionally under the influence of the weather retire into deep water, and are of course more difficult to be obtained.

*Fishing season—Height of ditto.*—If under this heading is meant the season for taking fish, and the period when they are most abundant, it seems from the practice that, except in the cases of barracouta, kingfish, and some others which approach the coast at fixed periods annually, the fishing season is interminable.

*Fishing season, and height of ditto.*—If the season means when the fish are considered prime for human consumption, it is a little before spawning, when the roe is nearly at maturity, and to destroy them at this time would not in pisciculture be deemed at all conservative to the species; but considering the innumerable enemies, fish and fowl, preying upon them, the insignificant few that man can despoil of ocean fish, the destruction would not be noticeable.

The months numbered in the column 1 to 12 allude to the corresponding months of similar seasons in the Antipodes, when similar and the same species are said to be in season, and sold in Billingsgate and other London markets; we know that aliens in the animal and vegetable kingdom when transferred to another clime soon adapt themselves to the season of reproduction.

*Molluscs.*—Except oysters, no value seems to be put upon or demand for shell-fish; the Tasmanian poor (*soi disant*) wife, widow, or child ignores an industry which in England and elsewhere furnishes profitable employment for thousands of human beings.

E. A. WALPOLE.

## GORDON.

*Oyster.*—The beds were destroyed by reckless fishing. Some years ago I saw eleven boats at one time engaged in dredging in the Southport Narrows. When the boats were filled the men sorted the oysters and threw the small ones over the side, where they would lie in heaps at the bottom of the water, and perish, instead of redistributing them over the beds.

*Sharks.*—Many tons are now taken every year, the oil from the livers being sold in Hobart, and the carcasses sold to fruit-growers or made into the compound known as fish manure.

*Rays and Starfish* are also largely caught for the manufacture of the "manure."

HENRY J. DALDY.

## RALPH'S BAY, RIVER DERWENT.

*Mullet and Flounders.*—Having lived some eight or ten years on the shores of Ralph's Bay, and having frequently gone of an evening to see the fishermen haul their seines, and having seen what a number of small fish are destroyed, I do not at all wonder at their becoming so scarce. I have been informed by the fishermen that years ago there were about eight boats (seines), and four men in a boat, and that they would be in the bay about four nights in a week, and catch plenty; whereas, now, one or two boats in a month (unless in the very height of the season) will not get a freight. I have known them to run their seine round a school of young mullet and take about five or six bushels of the largest and leave thousands to die on the beach. The professionals are not nearly so wasteful as the amateurs, for they (the professionals) do sometimes make show of putting the small fry back into the water, whereas I have known the amateurs to leave hundreds of large fish as well as small on the beach, just taking a few, viz.—the flounders and English salmon (*Salmo trutta*), they only fishing for English salmon. The so-called English

salmon are very plentiful at times, but they are small. I have seen them not more than eight inches long, or even less, and I believe the fishermen have caught occasionally great numbers about 10 inches long, about February; but they are very cautious of speaking about them. We have caught them in a graball 29 inches. They are very destructive to the mullet and other young fish. I have seen their stomachs packed (like sardines in a tin) with 8 or 10 fish, chiefly young mullet. If Ralph's Bay was closed against seine-fishing for two or three seasons, I believe it would greatly increase the supply of fish.

WILLIAM YOUNG.

#### MACQUARIE HARBOUR.

*Ling.*—These fish are not very plentiful in Macquarie Harbour. Mr. F. O. Henry recently caught a very fine specimen, 3 feet 6 inches long.

Fishing as a pursuit has not been carried on along the West Coast yet, though there is no doubt that, owing to the increased population, it will be ere long.

No kelp grows inside Macquarie Harbour, and there have been no crayfish nor kelp-fish found here yet.

The West Coast being a recently known portion of the Colony, no one is in a position to speak with regard to the seasons and habits of the fish inhabiting this coast.

C. PURDY.

#### DELORAINÉ.

*Brown Trout.*—I believe these fish are continually being destroyed by poachers, who net and shoot them, and numbers of persons fish in this district without a licence; I have also heard of dynamite being used to destroy them: and the best means to preserve them would be the formation of fish and game societies in each district where trout abound.

I fish for trout two or three times a week, and do not find them near so large or so plentiful as last year.

CALEB J. L. SMITH, J.P.

#### EXTON.

I REGRET to say that I am not in a position to afford you any great assistance in your enquiry into the fisheries of the locality, as I am not a great fisherman myself. In the Meander, eels and blackfish and brown trout are fairly plentiful, and herring are occasionally obtained. The Meander eels are a good table fish. The blackfish run very small generally about here, and fewer large ones are taken every year. The bulk of them now run under a quarter of a pound. The trout-fishing seems but poor sport from what I hear, as they are very shy in taking a fly or grasshopper, and give but little play when hooked. They are, I think, increasing in number, and I have heard of several good bags being made during the summer.

HENRY MARTIN.

#### MEANDER RIVER.

*Trout, Herring, Blackfish (Meander River.)*—I suggest as the best means of preserving fish in the Meander River, that a licence of five shillings per annum be required to allow any person to fish in this river, and that with the proceeds persons be paid to see that no illegal fishing is carried on. To my certain knowledge large numbers of trout are caught by persons fishing for blackfish in the early part of the season. I consider it most desirable that properly authorised persons be appointed to see that poaching is not carried on.

In my opinion the fish require protection, although some consider the trout can take care of themselves, and that soon it will not be necessary to protect them at all.

GOOCH FOWELL.

#### LONGFORD.

*Trout and Blackfish.*—The trout are dying in the Longford River, from what cause I cannot tell, unless it is the number of fellmongery establishments that are continually at work,—certainly there is something very wrong. What makes me think so is that the fish above the fellmongery establishments are all in splendid condition, quite the reverse here,—they are not fit to eat; but it does not seem to affect the blackfish. The only reason I assign is that the trout puddle like ducks, and will take anything they come across, the blackfish will not; their natural food is worms.

I have given you all the information that I know, and hope it will be of use.

WM. HOGG.

## ROSS.

*Fish in the Macquarie River.*

*Brown Trout.*—These fish are the produce of ova procured in September, 1869, and hatched here. Some more ova were subsequently put in near the College, by the late Mr. Allport. They have since increased to a limited extent. The river having a muddy bottom in most parts is not favourable to them. A number of trout have been caught by the Rev. G. B. Richards and Colonel Lethbridge, but I have heard of no other fishermen.

*Tench.*—This English fish is in the Macquarie in considerable numbers, but does not readily take bait, owing to the quantity of natural food in the river. I think it was placed in the South Esk, and found its way into the Macquarie.

*Eels.*—These are indigenous and I need not say anything about them, except that they are not nearly so numerous as they were about 30 years ago.

THOS. B. BLYTH, *Warden, Ross.*

## BOTHWELL.

*Trout.*—Small trout are numerous in the Rivers Clyde and Shannon, but the large fish seem to have disappeared altogether, it being very seldom that fish weighing over a couple of pounds are now caught, while 3 or 4 years ago it was not uncommon to kill them weighing from 4 to 6 lbs.

I think, however, that they must have made to the Great Lake and Lake Crescent, because there are large numbers in those lakes weighing from 5 to 16 lbs. each.

N. P. ALLISON, *Warden.*