

SECTION XI.

FISHERIES AND PISCICULTURE.

§ 1. Commercial Fisheries.

1. **Fish Stocks.**—Australasia possesses an abundant and varied fish fauna, which embraces both tropical and temperate varieties and includes destructive as well as valuable species. In rivers and lakes both indigenous and imported varieties thrive. The latter have been introduced and acclimatised for industrial and sporting purposes by Governments and angling societies. Exploitation of the fishing areas—for some classes of fish for the whole year, for others during the breeding season only, or until a certain size is attained—is, where necessary, expressly forbidden; proclaimed localities are closed against net-fishing, and a minimum size of mesh for nets is fixed. The sea-fishermen in some districts have made regulations in their own interests for the purpose of controlling the market supply, and these they rigorously observe.

2. **Economic Fisheries.**—Although Australia's food fishes are abundant, the development of the industry has been slow. It has been authoritatively stated that the marine fisheries, properly fostered, will develop into an industry of national importance. Local catches of lake and river fishes furnish, in the aggregate, a not inconsiderable amount of food supply. (See also § 5 and 6 hereinafter.)

3. **Distribution of Supplies.**—Present methods of distribution impose serious difficulties on the development of fishing generally, since there is a wide divergence between the price paid by the consumer and the return received by the producer. States and municipalities are interesting themselves in the direction of more economic distribution. Good markets are assured in the chief cities for regular deliveries of fresh fish. (See also § 5 and 6 hereinafter).

4. **Oyster Fisheries.**—Natural oyster beds, whose ample product is of excellent quality, exist on the foreshores in the shallow waters of inlets and estuaries in several parts of Australia. By husbanding the natural crop, and by judicious transplanting, the oyster output has been very materially augmented, and it is believed that there is a great future for the industry. The areas are leased by the Government to private persons, lengths of foreshore being taken up and profitably exploited. In New South Wales and Queensland particularly, the industry has developed; and small yields have been obtained in South Australia and Victoria.

5. **Pearl-shelling, Beche-de-Mer, etc.**—(i.) *General.* Pearl-shelling is carried on in the tropical districts of Queensland, the Northern Territory, and Western Australia. The pearl oyster inhabits the northern and western coastal waters from Cape York to Shark Bay, a length of shore of over 2000 miles. The shells are marketed in considerable quantities, and pearls also are obtained in Queensland and Western Australia. The fishing is generally conducted with the aid of diving apparatus, in water varying from

four to twenty fathoms in depth. In Queensland and the Northern Territory the bêche-de-mer industry is carried on, and tortoiseshell is obtained on the coasts. Experiments have been made in cultivating the pearl oyster on suitable banks. In October 1911, a pearl weighing 178 grains, and valued at £3000, was obtained at Broome. Further details regarding pearl-shelling are given in Official Year Book No. 6, p. 463. Trochus shell to the value of £12,000 and £23,000 was raised in Queensland during 1915 and 1916 respectively.

(ii.) *Royal Commission on Pearl-shelling Industry.* In accordance with the "White Australia" policy, it was originally determined that the employment of Asiatic labour in the pearl-shelling industry should be restricted, and ultimately cease, and it was proposed that after 31st December, 1913, permits to indent Asiatics for the pearling fleet should no longer be issued. In view, however, of the disorganisation of the industry occasioned by the war, the time was extended to the 30th June, 1918, after which date permits to introduce Asiatic labour were to be granted only in cases where the diver and tender of a boat were Europeans. Since the receipt of the Report of the Royal Commission, referred to hereunder, this proviso was, however, revoked. In March, 1912, a Royal Commission to inquire into the pearling industry was appointed by the Commonwealth Government, and after visits to the Queensland and Western Australian waters, various sittings, and the issue of a progress report, presented its final report in 1916. The Commissioners stated that, while it may be practicable, they did not consider it desirable or profitable to attempt by any drastic methods to transfer the industry from Asiatics to Europeans. They further stated that, while the labour now employed is almost entirely Asiatic, they did not consider that the "White Australia" policy would be weakened or imperilled by allowing the industry to continue as at present conducted.

§ 2. Fisheries Statistics.

1. *Estimates for the Commonwealth.*—The returns given below have been furnished by the State departments. Estimates and approximations, where shewn, are official. The data do not generally lend themselves to presentation on a uniform scheme, but the principal facts have as far as possible been compiled for the Commonwealth. The figures for New South Wales are exclusive of the State Trawling operations.

GENERAL FISHERIES (EXCLUDING EDIBLE OYSTERS, PEARLSHELL, AND BÊCHE-DE-MER), COMMONWEALTH, 1916.

State.	No. of Boats Engaged.	Value of Boats and Equip- ment.	No. of Men Em- ployed.	Total Take of		Value of Take.	
				Fish.	Lobsters.	Fish.	Lobsters.
	No.	£	No.	cwt.	doz.	£	£
New South Wales ...	1,007	57,943	3,006	169,321	†10,561	231,881	†7,921
Victoria ...	685	59,865	883	88,397	15,071	108,654	8,427
Queensland...	613	30,435	1,138	54,200	...	69,508	...
South Australia ..	850	32,000	1,203	131,000	cwt 11,000	235,500	14,000
Western Australia ...	243	20,937	487	24,746	7,057	45,000	3,234
Tasmania ...	170	20,400	310	*	*	46,500	*
Northern Territory†...	13	350	75	1,910	...	5,492	...
Commonwealth ...	3,581	221,930	7,102	\$469,574	*	742,535	\$33,582

* Not available. † Also 1,138 baskets crabs, value £854. ‡ For year 1915.
§ Exclusive of Tasmania.

The available returns from the Commonwealth oyster fisheries appear in the next table. Edible oysters are not found in Western Australia. There is no information available in regard to the small consumption of local oysters in Tasmania.

EDIBLE OYSTER FISHERIES, COMMONWEALTH, 1916.

State.	Number of Boats Engaged.	Value of Boats and Equip-ment.	Number of Men Em-ployed.	Number of Leases.	Oysters Taken.	
					Quantity.	Value.
	No.	£	No.	No.	cwt.	£
New South Wales ...	401	13,937	399	2,979	40,681	58,418
Victoria ...	50	2,500	70	1	12,685	4,550
Queensland ...	94	9,943	146	654	31,874	31,421
South Australia ...	2	500	3	...	500	500
Western Australia ...	...	...	...	...	...	...
Tasmania ...	...	...	...	...	...	...
Northern Territory ...	...	...	...	...	...	...
Commonwealth ...	547	26,880	618	3,634	85,740	94,884

The pearling industry is carried on in the tropical waters of Queensland, Western Australia, and the Northern Territory. During the last few years the return from the pearling industry has been adversely affected by labour conditions, coupled with the restriction in the market consequent on the war. Some of the pearling fleets have transferred their operations to Dutch waters. Bêche-de-mer is obtained in Queensland and the Northern Territory, the product being exported to China.

PEARL, PEARLSHELL, AND BÊCHE-DE-MER FISHERIES, COMMONWEALTH, 1916.

State.	Number of Boats Engaged.	Value of Boats and Equip-ment.	Number of Men Em-ployed.	Quantity of Pearls obtained.	Value of Pearls obtained.	Value of Pearls obtained.	Value of Bêche-de-mer obtained.	Value of Tor-toiseshell ob-tained.
	No.	£	No.	Tons.	£	£	£	£
New South Wales ...	...	...	...	...	...	...	...	...
Victoria ...	...	...	...	...	...	...	...	...
Queensland ...	124	40,706	1,053	6½	125	†	30,062	212
South Australia...	...	...	...	...	...	...	...	...
West Australia ...	280	119,367	2,133	1,490	222,995	27,190*	...	...
Tasmania ...	...	...	...	...	...	...	...	...
N. Territory† ...	25	6,250	150	42	6,135	...	160	50
Commonwealth	429	166,323	3,336	1,538½	229,255	†	30,222	262

* Exclusive of pearls obtained by Japanese divers, of which no record is obtained.

† For year 1915. ‡ Not available.

Information in regard to the value of pearls obtained was furnished by Western Australia only, the figures for 1916 being £27,190, as compared with £14,894 in the preceding year and £90,000 in 1914. Pearls obtained in Queensland waters were valued at £6,120 in 1914. For obvious reasons the returns can be regarded as rough approximations only. The next table gives the revenue from fisheries in each State.

PUBLIC REVENUE FROM FISHERIES, COMMONWEALTH, 1916.

State.	Licenses.	Leases.	Fines and Forfeitures.	Other Sources.	Total.
	£	£	£	£	£
New South Wales ...	1,370	8,432	241	154	10,197
Victoria ...	320	1	450	27	798
Queensland...	2,293	3,716	68	...	6,077
South Australia	425	...	...	...	425
Western Australia ...	3,581	1,916	...	44	5,541
Tasmania* ...	630	...	5	30	665
Northern Territory ...	54	...	...	...	54
Commonwealth ...	8,673	14,065	764	255	23,757

* Returns incomplete; refer mainly to Fisheries Board of Hobart.

A summary of the main items of information available in regard to General and Oyster Fisheries in the Commonwealth is given hereunder for the five years 1912-16 :—

GENERAL AND OYSTER FISHERIES, COMMONWEALTH, 1912 to 1916.

Particulars.	1912.	1913.	1914.	1915.	1916.
General Fisheries—					
No. of boats engaged ...	2,898	3,114	3,321	3,374	3,581
„ men employed ...	6,114	6,428	7,363	7,355	7,102
Fish obtained—					
Quantity ... cwt.	391,168†	388,371†	563,543	466,040†	469,574†
Value... .. £	497,345	489,236	519,723	709,176	742,535
Lobsters obtained—Value, £	27,840	30,879	33,111	30,722	33,582†
*Edible Oyster Fisheries—					
No. of boats engaged ...	485	428	398	503	547
„ men employed ...	518	487	453	618	618
Oysters obtained—					
Quantity ... cwt.	58,113	68,054	60,199	71,122	85,740
Value £	79,933	74,204	62,153	76,160	94,884
Public Revenue from Fisheries					
Licenses £	5,576	7,379	9,664	7,717	8,673
Leases £	11,668	11,081	12,823	13,004	14,065
Fines and forfeitures	495	480	427	713	764
Other sources £	625	442	662	218	255
Total revenue £	18,364	19,382	23,576	21,652	23,757

* There are practically no oyster fisheries in Victoria, Western Australia, and Tasmania.

† Exclusive of Tasmania.

The following table gives in summarised form for the years 1912-16 the details available in regard to pearling and bêche-de-mer fishery for the States where these industries are carried on, i.e., Queensland, Western Australia, and the Northern Territory. The low production in 1915 was, of course, due to the loss of market occasioned by the war. For obvious reasons, figures regarding value of pearls obtained can be taken as rough approximations only.

**PEARL, PEARLSHELL, AND BÊCHE-DE-MER FISHERIES, COMMONWEALTH,
1912 to 1916.**

Particulars.	1912.	1913.	1914.	1915.	1916.
No. of boats engaged ...	607	598	581	346	429
No. of men employed ...	4,291	4,277	4,137	2,561	3,336
Pearlshell obtained—					
Quantity ... tons	2,103	2,014	1,823	1,180	1,538½
Value ... £	530,298	346,437	297,776	143,407	229,255
Pearls obtained *—					
Value ... £	106,375†	97,730†	97,535†	14,894†	27,190†
Bêche-de-mer obtained—					
Quantity ... tons	450	625	531	770	513
Value ... £	25,142	30,943	27,847	40,078	30,222
Tortoiseshell obtained—					
Quantity ... lbs.	1,302	1,382	870	327	982
Value ... £	785	850	625	155	262

* As returned.

† Incomplete; and exclusive of pearls obtained by Japanese divers.

In addition to the production mentioned above, Queensland during 1916 raised 951 tons of trochus shell, valued at £22,941. The shell is used principally in the manufacture of "pearl" buttons.

§ 3. Oversea Trade in Fish.

That the development of the fishing industry in Australia leaves much to be desired is evident from the fact that the import of preserved fish into the Commonwealth is very large. The figures for the imports for the last five years were as follows:—

IMPORTS OF FISH, COMMONWEALTH, 1912 to 1916-17.

Classification.	1912.	1913.	1914-15.	1915-16.	1916-17.
Fresh (oysters) ...	cwt. 8,765	8,912	6,353	4,736	3,059
	£ 5,279	5,281	4,187	3,040	2,157
Fresh, or preserved by cold process... ..	cwt. 25,673	34,172	27,015	25,771	18,363
	£ 56,396	78,510	65,741	68,676	48,191
Potted	cwt. *	*	*	*	*
	£ 35,506	37,644	38,552	54,414	44,268
Preserved in tins ...	cwt. 194,092	171,733	194,005	213,347	174,145
	£ 606,969	525,996	660,693	755,286	715,741
Smoked, dried and n.e.i.	cwt. 26,472	24,629	15,477	10,403	10,015
	£ 76,327	70,605	37,141	32,868	37,239
Total ...	{ cwt.† 255,002	239,446	242,850	254,257	205,582
	£ 780,477	718,036	806,314	914,284	847,596

* Not available. † Exclusive of potted fish.

Tinned fish constitutes by far the largest proportion of the imports, the bulk of it consisting of salmon from the United States, Canada, Norway, and Alaska. The potted fish comes chiefly from the United Kingdom. New Zealand supplies the largest proportion of the fresh fish, the bulk of the remainder coming from the United Kingdom. The small import of oysters consists entirely of New Zealand produce.

The exports of local fish produce for the five years 1912 to 1916-17 is given hereunder :—

EXPORTS OF FISH (AUSTRALIAN PRODUCE), 1912 to 1916-17.
COMMONWEALTH.

Classification.		1912.	1913.	1914-15.	1915-16.	1916-17.
Fish, fresh, smoked, or preserved by cold process	{ cwt.	137	114	1,919	918	764
	{ £	436	367	9,532	2,806	3,089
Preserved in tins, dried, salted, etc.	{ cwt.	38,268	11,334	10,655	11,044	12,222
	{ £	35,827	40,573	29,337	40,441	39,839
Total	{ cwt.	38,405	11,448	12,574	11,962	12,986
	{ £	36,263	40,940	38,869	43,247	42,928

The quantity of fresh fish exported from the Commonwealth is trifling, and the amount of £3089 shewn in the table above consists chiefly of cured bêche-de-mer exported to Hong Kong from Queensland and the Northern Territory. The bulk of the amount of £39,839 consists of an export of salt fish also to Hong Kong from Queensland.

The exports of pearlshell and tortoiseshell are given hereunder for the five years 1912 to 1916-17 :—

EXPORTS OF PEARLSHELL AND TORTOISESHELL, 1912 to 1916-17.
COMMONWEALTH.

Article.		1912.	1913.	1914-15.	1915-16.	1916-17.
Pearlshell ...	{ cwt.	64,976	41,813	26,276	50,124	69,515
	{ £	524,281	383,193	179,430	194,052	363,669
Tortoiseshell ...	{ lbs.	5,170	3,244	1,244	570	1,283
	{ £	3,454	2,081	822	333	802

Nearly 70 per cent. of the pearlshell exported during 1916-17 was consigned to the United States, which took nearly £246,000 worth of the total export. The next largest share went to the United Kingdom, which took £63,000 worth, while shell to the value of £46,000 was exported to Japan.

§ 4. Development of the Fishing Industry.

1. **Transport and Marketing.**—Up to the present the question of adequate transport and marketing of the proved supplies of fish has not been satisfactorily dealt with in all the States. In New South Wales, as shewn in § 6 hereinafter, the matter of exploiting and marketing trawlable fish has been undertaken by the State Government, which has also taken steps to improve the conditions under which the ordinary coastal fishing is carried on.

2. **Experiment and Culture.**—In many respects the fishing industry is capable of modification and development. Although some valuable work has been done by the State Governments in the way of experiment and culture, a uniform policy of development for Australia is desirable, and recommendations have been made that the Fisheries Departments of the various States should co-operate with the Federal Government with a view to increasing the productiveness of the Commonwealth waters; and that uniform fisheries laws should be adopted by adjacent States.

All live fish imported into Australia are examined on shipboard in order to prevent the importation of undesirable fish.

With the object of ascertaining something of the movements of oceanic fishes, as well as of those estuarine fishes which make periodical oceanic migrations, reports are furnished regarding the various kinds of fishes, etc., and their movements along the coast.

Fuller details regarding the activities of the States in fish-culture are given in Official Year Book No. 6, pp. 471-2.

By arrangement with the Commonwealth Fisheries Department, members of the staff of the Australian Museum, Sydney, accompanied the F.I.S. "*Endeavour*" on various cruises. Specimens were collected, mounted for scientific purposes, and distributed to other Australian Museums, a considerable number being put aside for the Commonwealth Fishery Museum.

3. Consumption of Fish.—Despite the circumstance that numerous varieties of valuable food fishes abound in the coastal waters of Australia, while the freshwater rivers and lakes yield abundant supplies of natural and acclimatised species, the fishing industry has not developed to the extent that might reasonably be expected. It has been said that the Australians are not an "ichthyophagous race," but the comparatively heavy import of dried and preserved fish would appear to disprove this statement. The natural explanation seems to be that the industry is ill-managed, the price to the consumer is high, while the fisherman's gain is uncertain—and the system of distribution lacks method. Considerable improvement has, however, been effected in recent years, particularly in New South Wales (vide § 6 herein).

§ 5. The Commonwealth Department of Fisheries.

1. The Federal Council of Australasia.—The Federal Council had power to legislate with regard to fisheries in Australasian waters beyond territorial limits. In its second session (opened 16th January, 1888) an Act was passed to regulate pearlshell and bêche-de-mer fisheries in Australasian waters adjacent to Queensland; and in the third session, opened shortly afterwards, the Act was made applicable to Western Australia. Upon the passing of the Commonwealth Constitution Act of 1900, however, the Federal Council ceased to exist.

2. Commonwealth Investigations.—In 1907 the Commonwealth Government decided to demonstrate what might be attained commercially by the application of modern methods. A Federal Investigation Ship, the "*Endeavour*," was constructed specially for the work, and a Director of Fisheries was appointed. Experimental cruises were immediately undertaken. These shewed that the Commonwealth possesses an asset of considerable value in her sea fisheries. The scope and results of the inquiries are set out in the reports issued by the late Director.

3. Scope of the Inquiry.—The immediate scope laid down for the investigation was, shortly, as follows:—

- (i.) By various means of capture to ascertain what marketable food-fishes may be found in ocean waters adjacent to Australia.
- (ii.) In what quantity they may be taken.
- (iii.) To what extent they migrate, and whither.
- (iv.) How they may be conveniently and economically captured.
- (v.) By systematic survey to find out and chart suitable fishing grounds.

In addition to the work which was thus carried on in the various recognised methods of capture (including long-line and drift-net fishing, etc.), hydrographic survey work, etc., was carried out for the purpose of ascertaining the nature of the sea bottom, depth of water, currents, and sea temperature.

4. **The F.I.S. "Endeavour."**—The construction of the investigation vessel was undertaken in the Commonwealth, and was upon the lines shewn by the most recent European experience to be of greatest advantage, with necessary modifications to suit the Australian climate. A description of the vessel, which was the first Commonwealth-owned sea-going ship, is given in Official Year Book No. 6, p. 473. Up to the end of 1913, 85 cruises had been made in eastern and southern waters. In 1914, 13 more cruises were successfully undertaken; but the vessel with all on board, including the Director, was lost on her 99th cruise, which was commenced on 20th November, 1914.

5. **Trawling Grounds Discovered by the "Endeavour."**—According to information supplied by the Commonwealth Department of Trade and Customs, it would appear from the experiments carried out by the "Endeavour" on the shelf of the east coast of Australia, that the best trawling grounds extend from near Port Stephens, in New South Wales, past Sydney to Gabo Island, continuing across the eastern slope of Bass Strait past Flinders Island to Tasmania. These trawling grounds cover an area of approximately 6000 square miles, and are within easy access to two markets—Sydney and Melbourne. Extensive operations have been carried out on these grounds, and fish in payable quantities have been obtained.

A very rich trawling ground has also been located in the centre of the Great Australian Bight, estimated to cover an area of about 4000 square miles. The depth varies from 80 to 300 fathoms, but the greater portion of the trawlable area is situated between 100 and 200 fathoms. Excellent results were obtained by the "Endeavour" in this locality, fine rock ling and flathead being among the many choice varieties caught. This ground is situated about half-way between Adelaide and Albany, and about two days' steaming from either place.

In both of the trawling areas referred to above, considerable quantities of prime edible fish have been caught by the "Endeavour," thus demonstrating the potential value of Australia's deep-sea fisheries.

6. **The Continental Shelf.**—In addition to the primary duty of locating payable trawling grounds, extensive hydrographic surveys were carried out by the "Endeavour" along the coast from the north of Queensland to the west coast of Western Australia. Soundings, samples of the sea bottom, sea temperatures, etc., were taken, principally within the hundred-fathom line, in order to determine the suitability or otherwise of the localities for trawling. These observations were, in most instances, taken prior to the casting of the trawl net, which was the principal means of capture used by the "Endeavour" for ascertaining the richness of areas so far as the abundance of fish food was concerned. Most of the soundings have been charted and are available for public information.

The late Mr. H. C. Dannevig, formerly Director of Fisheries for the Commonwealth, in his "Report on the Continental Shelf on the East Coast of Australia" (Fisheries—Volume III., Part 6), explained how systematic surveys were carried out by him on the "Endeavour," and information obtained as to the nature of the continental shelf which surrounds the Australian continent.

The shelf consists of a narrow submerged ledge, varying in width from 10 miles to more than 100 miles, covered by a depth of less than 100 fathoms. From the outer edge of this ledge or shelf the bottom slopes away more or less abruptly towards the great ocean depths. It is within the area of the shelf that trawling grounds may be looked for.

On the east coast of Australia, the typical shelf commences at Sandy Cape in Queensland, and continues southwards. For about 360 miles, or south of Smoky Cape in latitude 31° S., the shelf presents peculiarities which gradually disappear further south. One of these peculiarities is that the shallow portion of the shelf continues seawards for a considerable distance, so that, for instance, at Double Island, the depth is only 50 fathoms. At this depth the shelf may here be said to terminate, as, at depths

from 60 to 100 fathoms, apart from being narrow and rocky, the sea floor is frequently so steep as to form part of the general slope downwards to abysmal depths. Another peculiarity is that northwards from Cape Moreton the shallow portion of the ledge is mainly covered with coral sand, which southwards gives way to a somewhat yellow sand, occasionally interspersed, in localities where the currents are strong, with gravelly beds.

Southwards from Smoky Cape the relative proportion between the inner and outer areas becomes reversed. At the Cape itself the shelf is narrow and divides into two equal belts; the shallow area of less than 50 fathoms, and a deeper stratum with an average depth of 70 fathoms. From here southwards the outer stratum becomes gradually wider at the expense of the inshore or secondary ledge, a maximum width of which is found in the Newcastle Bight, where the inshore ledge is seven to eight miles wide, while the outer ledge extends for another twenty-one miles before breaking off into the deep. Simultaneously with the appearance of the outside ledge at Smoky Cape the depth of the "break off" increases quickly to about 100 fathoms, and remains so for the remainder of the coast south to Gabo Island.

Southwards from Gabo Island the shelf widens out considerably, and consists entirely of the outward or deeper stratum, which, between 50 and 300 fathoms, is many miles wide. The edge gradually bends westward parallel with the coast until opposite the mouth of the Snowy River, where at a distance of about thirty miles from land it turns abruptly to the south. On approaching the bend, the shallow area (of less than 50 fathoms) has gradually extended at the expense of the outer ledge, and while the former continues westward through Bass Strait and connects Victoria and Tasmania, the latter extends as a relatively narrow belt along the eastern slope past Flinders Island and along the east coast of Tasmania.

The hundred-fathom line from the south of Tasmania to the western end of the Great Australian Bight was also surveyed by the "Endeavour." On that portion of the coast it was found that the continental shelf was considerably wider than on the east coast, and the slope of the shelf more gradual.

7. Publications of the Commonwealth Fisheries Department.—New and rare species of fish and marine forms secured by the "Endeavour" have been preserved, examined and described by various scientists, recognised as authorities on the subject of marine life. The following monographs have been published by the Department of Trade and Customs, the names of the authors being appended:—

SUBJECT.			AUTHOR.
<i>Mollusca</i> (2 parts)	...	...	Charles Hedley, F.L.S. (Assistant Curator and Conchologist, Australian Museum, Sydney).
<i>Fishes</i> (4 parts)	...	...	Allan R. McCulloch (Zoologist, Australian Museum).
<i>Sponges</i>	...	...	E. F. Hallmann, B.Sc. (Australian Museum).
<i>Assymetron</i>	...	...	Miss Janet W. Raff, B.Sc. (Melbourne University).
<i>Globigerina Ooze</i>	...	...	F. Chapman, B.A., A.L.S. (Palæontologist, National Museum, Melbourne).
<i>Hydroida</i> (3 parts)	...	...	W. M. Balé, F.R.M.S.
<i>Foraminifera and Ostræoda</i>	...	...	F. Chapman, B.A., A.L.S.
<i>Algæ</i>	...	...	A. H. Lucas, M.A. (Sydney Grammar School).
<i>Polychæta</i>	...	...	William Benham, M.A., D.Sc., F.R.S. (Professor of Biology at the University of Otago, N.Z.)
<i>Gephyrean Priapulæ</i>	...	...	Do. do. do.
<i>Sea Lilies, Star Fishes, Brittle Stars and Sea Urchins</i>	...	...	Hubert Lyman Clark (Curator of Echinoderms, Museum of Comparative Zoology, Cambridge, Mass., U.S.A.).
<i>Cephalopoda</i>	...	...	S. Stillman Berry.

The following papers were, in addition, prepared by the Director of Fisheries, the late H. C. Dannevig:—

First and Second Preliminary Reports on the Fishing Experiments carried out by the F.I.S. "Endeavour."

Notes on Australia's Fisheries, with a summary of the results obtained by the F.I.S. "Endeavour."

Paper on the Continental Shelf of the East Coast of Australia.

Paper on the Physiography of Bass Strait.

§ 6. The State Trawling Industry—New South Wales.

As far back as the year 1898, the New South Wales Government equipped a small vessel called "Thetis" for the purpose of investigating the potentialities of the State coastal waters in regard to the supply of edible fish. The knowledge gained from the cruises of this vessel was, of course, considerably augmented by that obtained since 1907 by the more modern methods adopted by the Commonwealth vessel "Endeavour." In view of the favourable outlook, the State Government determined to exploit the fishing industry. The necessary vessels and equipment were ordered, and by the middle of the year 1915, three steam trawlers built of steel and equipped in accordance with the most up-to-date methods had commenced operations in the coastal waters. Other vessels have also been built for trawling and surface fishing. It was not long before these vessels had proved the existence of highly valuable trawling grounds within a day's steam of Sydney Heads, and what is believed to be one of the most prolific areas in the world has been located within three hours steam of the home wharf. The ample product has been landed and sold to the public at extremely low rates in the State retail depôts as well as at occasional sales in markets and in country districts.

There are seven State retail fish depôts, six in the metropolitan district, and one at Newcastle.

Moreover, in connection with the undertaking, arrangements have been made for the collection and distribution of fish taken by coastal and estuarine fishermen. With this end in view, large refrigerating stations have been built at Newcastle, Clarence River and Port Stephens. The scheme has proved a great boon to fishermen by obviating the losses caused by the uncertain supply of ice and the absence of facilities for marketing.

There is a strong feeling that it is desirable for either the Government or the City Council to take over the entire control of the fishing industry.

§ 7. Fish Preserving.

Bounties have been provided by the Federal Government for fish preserving, the rate payable being $\frac{1}{2}$ d. per lb. The amounts paid were £27 in 1907-8; £1727 in 1908-9; £311 in 1909-10; £115 in 1910-11; £168 in 1911-12; £103 in 1912-13; £80 in 1913-14; £156 in 1914-15; £106 in 1915-16, and £177 in 1916-17. It is hoped that the bounties, together with the increased yield that may be expected to result from the fisheries investigations now being conducted, will lead to a considerable output and consumption of locally-preserved fish. Up to the present but little development has taken place, the establishments which claimed bounty for fish preserving numbering only five in 1916-17, as compared with two in the preceding year, and five in 1914-15.