

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.

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.

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, Bêche-de-Mer, etc.**—(i) *General.* Pearl-shelling is carried on in the tropical waters 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 2,000 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 4 to 20 fathoms in depth. In Queensland and the Northern Territory the bêche-de-mer

industry is carried on, and tortoise-shell 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 £3,000, 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 £23,000, £21,800, £37,886, £30,280, and £41,698 was raised in Queensland during 1916, 1917, 1918, 1919, and 1920 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, though it might 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. At Thursday Island the pearling industry is almost monopolised by Japanese.

§ 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.

GENERAL FISHERIES (EXCLUDING EDIBLE OYSTERS, PEARL-SHELL, AND BÊCHE-DE-MER), COMMONWEALTH, 1920.

State or Territory.	No. of Boats Engaged.	Value of Boats and Equipment.	No. of Men Employed.	Total Take of—		Value of Take.	
				Fish.	Spiny Lobster (Crayfish).	Fish.	Spiny Lobster (Crayfish).
	No.	£	No.	cwt.	doz.	£	£
New South Wales ..	935	64,461	93,388	5210,319	6,396	5374,443	522,776
Victoria (e) ..	873	110,010	1,380	105,038	18,690	148,250	16,330
Queensland ..	633	40,187	1,226	47,200	..	89,517	..
South Australia(e) ..	850	30,000	910	(a)	(a)	250,000	(f)
Western Australia	232	21,856	514	23,093	8,598	64,659	4,299
Tasmania (d) ...	99	8,710	213	doz. 107,846	4,310	12,536	1,480
Northern Territory (e)	2	560	3	45	..	113	..
Commonwealth (d)	3,624	275,784	7,634	(a)	(a)	939,568	44,885

(a) Not available. (b) Including 55,180 cwt. fish, valued at £115,878, obtained by State trawlers and private fishermen. (c) Including £13,182, the value of 4,575 cwt. prawns and 656 baskets crabs. (d) Incomplete. (e) Year ended 30th June, 1921. (f) Included with fish. (g) Number of licensed fishermen.

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 amount of local oysters obtained in Tasmania.

EDIBLE OYSTER FISHERIES, COMMONWEALTH (a), 1920.

State or Territory.	Number of Boats Engaged.	Value of Boats and Equipment.	Number of Men Employed.	Number of Leases.	Oysters Taken.	
					Quantity.	Value.
	No.	£	No.	No.	cwt.	£
New South Wales	439	15,296	421	3,642	43,563	75,063
Victoria(b)	(c)	(c)	(c)	19	3,471	3,044
Queensland	93	12,181	118	395	25,733	30,587
South Australia(c) .. ..	..	..	..	..	..	..
Commonwealth .. ..	..	..	..	4,056d	72,767d	108,694d

(a) Practically no oyster fisheries in Western Australia, Tasmania, and Northern Territory. (b) Year ended 30th June, 1921. (c) Included with General Fisheries. (d) Exclusive of South Australia.

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, PEARL-SHELL, AND BÊCHE-DE-MER FISHERIES, COMMONWEALTH (a), 1920.

State or Territory.	Number of Boats Engaged.	Value of Boats and Equipment.	Number of Men Employed.	Quantity of Pearl-shell obtained.	Value of Pearl-shell obtained.	Value of Pearls obtained. (d)	Value of Bêche-de-mer obtained.	Value of Trochus-shell obtained.
	No.	£	No.	Tons.	£	£	£	£
Queensland (b)	169	80,000	1,189	440	66,000	80	65,557	161
Western Australia	341	176,160	2,504	1,664	268,417	68,530	..	..
Northern Territory(c)	14	2,830	45	22	3,500	..	5,341	141
Commonwealth	515	258,990	3,738	2,126	337,917	68,610	70,898	302

(a) No pearl-shelling industry in New South Wales, Victoria, South Australia, and Tasmania. (b) Also trochus-shell to the value of £41,698. (c) Year ended 30th June, 1921.

For obvious reasons the returns in regard to the value of pearls obtained can be regarded as rough approximations only. The trochus-shell raised in Queensland is used principally in the manufacture of "pearl" buttons. The next table gives the revenue from fisheries in each State :—

PUBLIC REVENUE FROM FISHERIES, COMMONWEALTH, 1920.

State or Territory.	Licenses.	Leases.	Fines and Forfeitures.	Other Sources.	Total.
	£	£	£	£	£
New South Wales	1,422	9,037	204	330	10,993
Victoria(a)	639	29	120	11	799
Queensland	2,626	3,388	26	..	6,040
South Australia(a)	1,406	..	..	..	1,406
Western Australia	5,002	978	170	..	6,150
Tasmania	635	..	16	183	834
Northern Territory(a)	30	..	..	..	30
Commonwealth	11,760	13,432	536	524	26,252

(a) Year ended 30th June, 1921.

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 1916 to 1920 :—

GENERAL AND OYSTER FISHERIES, COMMONWEALTH, 1916 TO 1920.

Particulars.	1916.	1917.	1918.	1919.	1920.
General Fisheries—					
No. of boats engaged ..	3,581	3,401 (b)	3,287 (b)	3,838	3,624
No. of men employed ..	7,102	6,773 (b)	6,515 (b)	7,774	7,634
Fish obtained—					
Quantity .. cwt.	469,574 (b)	463,839 (b)	490,612 (b)	377,743(c)	385,695 (c)
Value .. £	742,535 (b)	695,718 (b)	755,059 (b)	877,120	939,568
Lobsters obtained—Value £	33,582 (b)	28,603 (b)	32,250 (b)	26,896(d)	44,885 (d)
Edible Oyster Fisheries(a)—					
No. of boats engaged ..	547	577	550	503(e)	532 (e)
No. of men employed ..	618	640	598	492(e)	539 (e)
Oysters obtained—					
Quantity .. cwt.	85,740	74,313	78,668	78,430(d)	72,767 (d)
Value .. £	94,884	86,550	92,261	100,910(d)	108,694 (d)
Public Revenue from Fisheries—					
Licenses .. £	8,673	9,080	8,903	10,959	11,760
Leases .. £	14,065	12,420	12,646	11,969	13,432
Fines and forfeitures £	764	358	438	523	536
Other sources .. £	255	999	575	3,919	524
Total Revenue £	23,757	22,857	22,562	27,370	26,252

(a) There are practically no oyster fisheries in Western Australia, Tasmania, and Northern Territory.
 (b) Exclusive of Tasmania. (c) Exclusive of South Australia and Tasmania. (d) Exclusive of South Australia. (e) Exclusive of Victoria and South Australia.

The following table gives in summarised form for the years 1916 to 1920 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. For obvious reasons, figures regarding value of pearls obtained can be taken as rough approximations only.

PEARL, PEARL-SHELL, AND BÊCHE-DE-MER FISHERIES, COMMONWEALTH, 1916 TO 1920.

Particulars.	1916.	1917.	1918.	1919.	1920.
No. of boats engaged ..	429	471	401	471	515
No. of men employed ..	3,336	3,615	2,935	3,453	3,738
Pearl-shell obtained—					
Quantity .. tons	1,538	2,192	1,616	2,300	2,126
Value .. £	229,255	264,295	224,115	387,034(b)	337,917
Pearls obtained(a)—					
Value .. £	27,190	39,333	63,487	74,212 (c)	68,610 (b)
Bêche-de-mer obtained—					
Quantity .. tons	513	624	468	308	..
Value .. £	30,222	42,064	48,933	42,721	70,898
Tortoise-shell obtained—					
Quantity .. lbs.	982	942	695	172 (c)	..
Value .. £	262	378	350	96 (c)	302
Trochus-shell obtained—					
Value .. £	23,000	21,800	37,886	30,280	41,698

(a) Incomplete; but as returned.

(b) Incomplete.

§ 3. Oversea Trade in Fish.

The development of the fishing industry in Australia leaves much to be desired, as 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, 1916-17 TO 1920-21.

Classification.		1916-17.	1917-18.	1918-19.	1919-20.	1920-21.
Fresh (oysters) ..	{ cwt.	3,059	1,583	2,321	520	2,092
	£	2,157	1,098	1,617	762	2,708
Fresh, or preserved by cold process	{ cwt.	18,363	11,080	5,383	9,444	17,558
	£	48,191	26,306	15,144	39,796	81,126
Potted	{ cwt.	(a)	(a)	(a)	(a)	(a)
	£	44,268	1,300	10,075	97,430	64,310
Preserved in tins	{ cwt.	174,145	148,421	62,426	148,684	103,505
	£	715,741	788,728	345,918	989,742	649,610
Smoked, dried, and n.e.i	{ cwt.	10,015	7,320	2,313	6,106	10,179
	£	37,239	35,602	15,863	38,298	52,774
Total ..	{ cwt. (b)	205,582	168,404	72,443	164,754	133,334
	£	847,596	853,034	388,617	1,165,938	850,528

(a) Not available. (b) Exclusive of potted fish.

Tinned fish constitutes by far the largest proportion of the imports, most of it consisting of salmon from the United States, Canada, Japan, 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 and Canada. The small import of oysters consists entirely of New Zealand produce.

The exports of local fish produce for the five years 1916-17 to 1920-21 are given hereunder:—

EXPORTS OF FISH (AUSTRALIAN PRODUCE), COMMONWEALTH, 1916-17 TO 1920-21.

Classification.		1916-17.	1917-18.	1918-19.	1919-20.	1920-21.
Fish, fresh, smoked, or preserved by cold process	{ cwt.	764	983	530	790	10,193
	£	3,089	4,048	2,591	6,017	86,474
Preserved, in tins, dried, salted, etc.	{ cwt.	12,222	13,413	7,072	9,259	102
	£	39,839	57,254	45,342	66,255	195
Total ..	{ cwt.	12,986	14,396	7,602	10,049	10,295
	£	42,928	61,302	47,933	72,272	86,669

The quantity of fresh fish exported from the Commonwealth is trifling, and the amount of £86,474 shewn in the table above consists chiefly of cured bêche-de-mer exported to Hong Kong from the Northern Territory.

The exports of pearl, tortoise, and trochus-shell, of Australian origin, are given hereunder for the five years 1916-17 to 1920-21 :—

**EXPORTS OF PEARL, TORTOISE, AND TROCHUS-SHELL, COMMONWEALTH,
1916-17 TO 1920-21.**

Article.		1916-17.	1917-18.	1918-19.	1919-20.	1920-21.
Pearl-shell ..	{ cwt.	69,500	59,598	49,300	45,040	31,480
	{ £	363,669	347,964	316,154	462,152	319,143
Tortoise-shell ..	{ lbs.	1,283	1,157	239	1,542	2,922
	{ £	802	483	138	1,011	1,864
Trochus shell ..	{ cwt.	..	..	..	26,000	11,900
	{ £	..	..	..	105,894	37,602

Most of the pearl-shell exported during 1920-21 was consigned to the United States and the United Kingdom, values being £100,087 and £217,859 respectively. A small export was also made to Japan.

§ 4. Development of the Fishing Industry.

1. **Transport and Marketing.**—Up to the present the question of the 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. In Queensland, also, State trawling was developed in 1919, and some good trawling bottoms have been located and charted between Cape Moreton and Caloundra.

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." The annual consumption of fish per head of population in Great Britain is 42 lbs.; in Australia it has been estimated at 10 lbs. The comparatively heavy import of dried and preserved fish would appear to indicate that there is great scope for the development of the industry, which now seems to be ill-managed, the price to the consumer being 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.

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 undertaken, which shewed that the Commonwealth possesses an asset of considerable value in her sea fisheries. The *Endeavour* was unfortunately lost at sea, with all on board, at the end of 1914, and has not been replaced. A description of the trawling grounds discovered, and the depth of the ocean to the east of Australia and a list of the publications of the Department are given in pp. 333 to 335 of Year Book No. 14.

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

The State Trawling Industry was established in 1915, and fishing operations are conducted with seven steel steam trawlers. The catches are landed at Sydney and Newcastle, and the fish is handled by means of retail shops, of which there are fourteen in the Metropolitan area, one in Newcastle, and five in country towns. During the year ended 30th June, 1920, the State trawlers landed over 2,800 tons of fish, valued at £117,696.

§ 7. Fish Preserving.

Bounties were provided for ten years by the Federal Government for fish preserving, the rate payable being $\frac{1}{4}$ d. per lb. The amounts paid were £27 in 1907-8; £1,727 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; £177 in 1916-17. In 1917-18, £35 was paid in satisfaction of a claim made in the preceding year. Up to the present but little development has taken place, the establishments which claimed bounty for fish preserving numbering only one in 1917-18, as compared with five in 1916-17, two in 1915-16, and five in 1914-15. No bounties were paid in 1918-19 and subsequent years.