

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 edible 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 sometimes 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.**—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 coasts from Cape York to Shark Bay, a length of shore of over 2000 miles. The shells are marketed in considerable quantities, and pearls are also 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 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.

The system of licensing boats and men engaged in the pearling industry restricts, in the States where it is in force, indiscriminate exploiting of the areas, and returns a small revenue.

Poaching in Australian territorial waters has long been rife, particularly on the north-west coast, and measures have recently been taken to check it.

In accordance with the "White Australia" policy, it has been determined that the employment of coloured labour in the pearl-shelling industry shall be restricted, and ultimately cease altogether. After 31st December, 1913, permits to indent Asiatics for the pearling fleet ceased, and all divers employed upon the luggers will eventually be white men. Experienced divers from England have been engaged. It is believed that practical difficulties which may arise in the transition period will be overcome. In March 1912 the Commonwealth Government appointed a Royal Commission to inquire into the pearling industry generally, and particularly as regards its labour problems. The Commission commenced its work at Cairns, Queensland, on 30th April, 1912. Evidence of a valuable nature has been taken in various centres; a progress report was presented in October 1913, and minutes of evidence, appendices, etc., were published in December 1913.

§ 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 been compiled as far as possible for the Commonwealth.

GENERAL FISHERIES (EXCLUDING EDIBLE OYSTERS, PEARLSHELL AND BÊCHE-DE-MER), COMMONWEALTH, 1913.

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 ...	681	29,655	2,712	135,139	9,732	136,907	4,379
Victoria ...	717	51,982	968	96,300	37,355	88,918	11,571
Queensland...	316	15,749	616	37,860	...	39,356	...
South Australia ...	950	31,000	1,232	85,000	24,000	161,000	9,000
Western Australia ...	273	20,984	572	*34,000	12,347	*42,000	3,704
Tasmania* ...	170	9,771	300	†	10,773	20,965	2,225
Northern Territory ...	7	350	28	72	...	90	...
Commonwealth ...	3,114	159,491	6,428	†388,371	94,207	489,236	30,879

* Estimated. † 159,545 dozen. ‡ Exclusive of Tasmania.

EDIBLE OYSTER FISHERIES, COMMONWEALTH, 1913.

State.	Number of Boats Engaged.	Value of Boats and Equip-ment.	Number of Men Employed	Number of Leases.	Length of Foreshore in Leases.	Oysters Taken.	
	No.	£	No.	No.	Miles.	Quantity.	Value.
New South Wales ...	327	9,678	337	1,896	279	34,646	44,773
Victoria ...	...	...	...	...	...	...	...
Queensland...	94	12,600	139	654	*	32,589	27,793
South Australia ...	7	660	11	*	...	819	1,638
Western Australia ...	...	...	...	...	...	...	...
Tasmania ...	...	...	...	...	...	...	...
Northern Territory ...	...	...	...	...	...	...	...
Commonwealth ...	428	22,938	487	2,550†	*	68,054	74,204

* Figures not available.

† Exclusive of figures for South Australia.

PEARL, PEARLSHELL, AND BÊCHE-DE-MER FISHERIES, COMMONWEALTH, 1913.

State.	Number of Boats Engaged.	Value of Boats and Equip-ment.	Number of Men Employed.	Quantity of Pearls obtained.	Value of Pearls obtained.	Value of Bêche-de-mer obtained.	Quantity of Tor-toiseshell obtained.	Value of Tor-toiseshell obtained.
	No.	£	No.	Tons.	£	£	lbs.	£
N.S.W. ...	...	...	...	...	...	...	...	...
Victoria ...	...	...	...	...	...	...	...	...
Q'sland ...	180	60,000	1,300	466	92,000	*8,265	29,268	1,167
S. Aust. ...	...	...	...	...	...	...	...	...
W. Aust. ...	379	202,550	2,743	1,489	240,776	88,050	...	...
Tas. ...	...	...	...	...	...	...	...	...
N. Terr. ...	39	4,605	234	59	13,661	1,415	1,675	215
C'wth. ...	598	267,155	4,277	2,014	346,437	97,730	30,943	1,382

* Exclusive of pearls obtained by Japanese divers, for which no record is obtained; estimated at about £25,000.

PUBLIC REVENUE FROM FISHERIES, COMMONWEALTH, 1913.

State.	Licenses.	Leases.	Fines and Forfeitures.	Other Sources.	Total.
	£	£	£	£	£
New South Wales ...	1,228	5,848	391	404	7,871
Victoria ...	...	...	...	...	...
Queensland...	2,146	3,630	2	11	5,789
South Australia ...	446	...	20	...	466
Western Australia ...	2,866	1,603	49	26	4,544
Tasmania* ...	622	...	18	1	641
Northern Territory ...	71	...	...	...	71
Commonwealth ...	7,379	11,081	480	442	19,382

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

GENERAL AND OYSTER FISHERIES, COMMONWEALTH, 1909 to 1913.

Particulars.	1909.	1910.	1911.	1912.	1913.
General Fisheries—					
No. of boats engaged ...	3,101	3,088	2,593	2,898	3,114
„ men employed ...	5,492	5,515	4,405	6,114	6,428
Fish obtained—					
Quantity ... cwt.	298,351	341,659†	350,828§	391,168‡	388,371‡
Value... .. £	276,672	381,182	474,027	497,345	489,236
Lobsters obtained—Value, £	16,078	22,172	27,718	27,840	30,879
Edible Oyster Fisheries—					
No. of boats engaged* ...	139	113	482	485	428
„ men employed* ...	175	174	589	518	487
Oysters obtained—					
Quantity ... cwt.	59,109†	59,854	64,397	58,113	68,054
Value £	63,192†	60,769	77,080	79,933	74,204
Public Revenue from Fisheries					
Licenses £	8,812	5,496	4,833	5,576	7,379
Leases £	7,446	9,842	11,583	11,668	11,081
Fines and forfeitures ...	142	180	345	495	480
Other sources £	649	742	386	625	442
Total revenue £	17,049	16,260	17,147	18,364	19,382

* Queensland and South Australia only for years 1909 and 1910. There are practically no oyster fisheries in Victoria, Western Australia, and Tasmania. † New South Wales and Queensland only. ‡ Exclusive of Tasmania. § Exclusive of Western Australia and Tasmania.

PEARL, PEARL-SHELL AND BÊCHE-DE-MER FISHERIES, COMMONWEALTH,*
1909 to 1913.

Particulars.	1909.	1910.	1911.	1912.	1913.
No. of boats engaged ...	567	586	578	607	598
No. of men employed ...	3,883	4,038	4,052	4,291	4,277
Pearlshell obtained—					
Quantity tons	1,770	1,853	1,717	2,103	2,014
Value £	270,256	299,143	327,444	530,298	346,437
Pearls obtained †—					
Value £	77,788	94,768	87,713	106,375‡	97,730‡
Bêche-de-mer obtained—					
Quantity tons	352	251	323	450	625
Value £	16,410	10,088	17,712	25,142	30,943
Tortoiseshell obtained—					
Quantity lbs.	3,532	2,070	1,056	1,302	1,382
Value £	1,739	998	572	785	850

* Queensland, Northern Territory and Western Australia only. There is no production in the other States. † As returned. ‡ Exclusive of pearls obtained by Japanese divers, estimated at £25,000.

§ 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 trade are as follows:—

IMPORTS OF FISH, COMMONWEALTH, 1909 to 1913.

Classification.		1909.	1910.	1911.	1912.	1913.
Fresh (oysters) ...	{ cwt.	10,580	9,640	7,152	8,765	8,912
	{ £	4,989	4,805	3,462	5,279	5,281
Fresh, or preserved by cold process... ..	{ cwt.	11,855	11,248	20,455	25,673	34,172
	{ £	20,785	23,001	44,536	56,396	78,510
Potted	{ cwt.	*	*	*	*	*
	{ £	22,082	25,408	26,024	35,506	37,644
Preserved in tins ...	{ cwt.	137,860	154,547	148,846	194,092	171,733
	{ £	371,620	466,381	443,049	606,969	525,996
Smoked, dried and n.e.i.	{ cwt.	21,667	19,448	21,605	26,472	24,629
	{ £	47,096	42,918	52,289	76,327	70,605
Total	{ cwt.†	181,462	194,883	198,058	255,002	239,446
	{ £	466,572	562,513	569,360	780,477	718,086

* Not available. † Exclusive of potted fish.

EXPORTS OF FISH (AUSTRALIAN PRODUCE), 1909 to 1913.

COMMONWEALTH.

Classification.		1909.	1910.	1911.	1912.	1913.
Fish, fresh, smoked, or preserved by cold process	{ cwt.	994	912	248	137	114
	{ £	2,896	1,963	1,026	436	367
Preserved in tins, dried, salted, etc.	{ cwt.	6,746	5,346	6,891	38,268	11,334
	{ £	15,556	17,532	23,185	35,827	40,573
Total	{ cwt.	7,740	6,258	7,139	38,405	11,448
	{ £	18,452	19,495	24,211	36,263	40,940

Although a considerable development has taken place lately in the fish preserving industry, there is for the Commonwealth an excess of imports over exports amounting approximately to £450,000 in 1909, £540,000 in 1910, £545,000 in 1911, £745,000 in 1912, and £680,000 in 1913.

The exports of pearlshell and tortoiseshell are given hereunder for the five years 1909-13 :—

EXPORTS OF PEARLSHELL AND TORTOISESHELL, 1909 to 1913.

COMMONWEALTH.

Article.		1909.	1910.	1911.	1912.	1913.
Pearlshell	{ cwt.	34,585	40,307	39,126	64,976	41,813
	{ £	250,291	322,184	330,003	524,281	383,193
Tortoiseshell	{ lbs.	3,207	1,742	1,693	5,170	3,244
	{ £	1,557	823	964	3,454	2,081

§ 4. Development of the Fishing Industry.

1. **Transport and Marketing.**—For many years the question of securing to the consumer a regular supply of wholesome fish at a moderate price has been under consideration. Where quick transport by rail or steamer is not provided, the catch of fish in tropical or sub-tropical waters can only be locally consumed, since speedy marketing is essential. Adequate refrigerating apparatus on railway waggons and coasting steamers and quick transport to centres of population might, however, alter the economic condition in a satisfactory direction. In the temperate regions there are adequate supplies close to the principal ports—a fact which is of considerable advantage, since short trips mean marketing of the produce in good condition, and less sea risks are incurred. At the present time the natural wealth of Australia in fish is exploited only to a very slight extent.

2. **Experiment and Culture.**—*The Existing Fisheries.* In many respects the fishing industry is capable of modification and development. A good deal has been effected 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 arriving in 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., observed travelling along the coast, as well as the quantity and size of fish seen. Some very useful information has in this way been obtained.

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.

§ 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 béche-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. Cruises and experiments were immediately instituted. These shew 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 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 where.
- (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 is being thus carried on in the various recognised methods of capture (including long-line and drift-net fishing, etc.), survey, hydrographic work, etc., is conducted, for the purpose of ascertaining the nature of the 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 was lost on her 99th cruise, which was commenced on 20th November, 1914.

5. **Consumption of Fish.**—The inadequacy of the present supply of fish in Australia is universally admitted, yet all reports agree that there is, off the coast, a bountiful harvest of fish. It is not, as in Great Britain and the northern countries of Europe, a popular article of diet, but is rather in the nature of a luxury. While the value of fish consumed in Norway is nearly 20s., and in Holland, Denmark, and the United Kingdom 5s. per head of population, in Australia it is little over 1s. 6d. Moreover, in the European countries named, notwithstanding the fact that the trawlers have generally to go much further afield for their catches, a shilling's worth of fish represents a much larger quantity than could be obtained for the same amount in the Commonwealth, where the wealth of the coastal waters indicates that, with satisfactory handling, the product of the sea would become an article of food for the poorest classes, and a valuable industry would be developed. The uncertainties and limitations of the market, caused by the irregularity of the supply, will be overcome when the fact is recognised that the ocean product, properly exploited, is adequate to supply the demand, however strong. Under present conditions, it is not surprising that Australians are not great fish-eaters. The quantity of fish consumed annually per head in Great Britain is 42 lbs.; in Australia it is only 9 lbs.

§ 6. 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; and £80 in 1913-14. It is anticipated 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. The abundance of fish in Australian waters offers excellent opportunities for the institution of preserving establishments, particularly in those coastal districts which enjoy a temperate climate. Up to the present but little development has taken place, the establishments for fish preserving numbering only five.