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SECTION XI.

FISHERIES AND PISCICULTURE.

§ 1. Commercial Fisheries.

1. **Early Fishing Excursions of Malays.**—Economic fisheries in Australia date back to a period long before the exploration of the northern and north-western shores of the continent by Tasman and Dampier. The Malays of Macassar, in their proas, made fishing excursions amongst the reefs and shoals skirting the coast, collecting and curing trepang and *bêche-de-mer*, a practice continued up to the present time. They arrive ordinarily at the beginning of the north-west monsoon, and return to Macassar after a few weeks, as the south-east monsoon sets in. Besides the *bêche-de-mer*, the Malays barter rice, tobacco, and gaudy handkerchiefs for tortoise-shell, pearlshell, and seed pearls, collected by the aborigines.

2. **Fish Stocks.**—Australasia, extending from 10° to 45° south latitude, produces an abundant and varied fish fauna, embracing both tropical and temperate characters, including destructive, as well as edible species, and on its shores both crustaceans and amphibians. In the rivers and lakes indigenous varieties thrive side by side with imported ones, introduced and acclimatised for industrial and sporting purposes by Governments and angling societies. Exploitation of aquarian products—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; areas are closed against net-fishing, and a minimum size of mesh for nets is sometimes fixed. Even where the State has not interfered, the sea-fishers in some districts have made regulations for the purpose of controlling the market supply, and these they rigorously observe.

3. **Economic Fisheries.**—Australia's food fishes, though abundant, have not led to the development of an industry of national importance, though fresh and salt water fisheries pay handsomely in other countries, and could no doubt do so in Australia. It has been authoritatively stated that "The collection and distribution of the knowledge of the world's work in fish-culture would make an acre of water more valuable than an acre of land, and the toilers of the sea could reap manifold their present harvest." This would involve also better arrangements for the distribution of fish than exist at present.

4. **Lake and River Fishing.**—Lake and river fishing take even lower industrial rank than marine fishing, though local catches furnish on the aggregate a not inconsiderable amount of food supply.

5. **Distribution of Supplies.**—The economic arrangements as to distribution impose at present 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. Municipal oversight has been undertaken in Sydney, with good results, and is proposed in other capitals.

6. Oyster Fisheries.—Natural oyster beds, whose ample product is of excellent quality, exist in the shallow waters of inlets and estuaries of several parts of the Australian foreshore. 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.

7. Pearl-shelling.—Pearl-shelling is carried on in the tropical districts of Queensland, South Australia (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. Along the north coast the pearls taken are small, and their aggregate value inconsiderable; but the shells are marketed in considerable quantities, the industry giving directly and indirectly employment to a large number of people, mostly Japanese, Chinese, and Malays. The Shark Bay pearling industry, however, is carried on for both gems and shells. The fishing is now generally conducted with the aid of diving apparatus, in water varying from four to twenty fathoms in depth. The inshore banks and shallower waters have been almost entirely worked out, and the deeper waters, from three to twenty miles off shore, are now being worked.

In tropical Queensland pearlshell diving is actively pursued, and is by far the most important of the fishing industries, Torres Straits being the centre of production. With it the pursuit of *bêche-de-mer* is carried on, and tortoiseshell is obtained on the coasts. The industry is supervised by the Marine Department, which administers the Fisheries Acts. A statutory limit is fixed for the minimum size of shell that may be gathered. Experiments have been made in cultivating the pearl oyster on suitable banks. A small variety has been discovered at Stradbroke Island, in Moreton Bay, but the commercial value of the produce is small. In October, 1909, a pearl of great beauty and fine quality from the Thursday Island fisheries, was exhibited in Melbourne. Its weight was 32½ grains, and its value was stated at £1000.

The discovery of mother-of-pearl shell in Port Darwin Harbour in 1884 caused a rush of pearling boats from Torres Straits. But the muddiness of the water, rendered almost opaque by the heavy tides, prevented the divers from satisfactorily working the area and led to an abandonment of the industry within three years from its birth. Prospecting in new patches has since been carried on and the industry has been revived. In addition to pearl and trepang fishing, dry-salted fish is also exported from the Territory.

In Western Australia the centres of the industry are Broome, Cossack, Onslow, and Shark Bay. There are two distinct species of mother-of-pearl shell exported. The principal trade is done in the large shells (*Meleagrina margaritifera*), limited in distribution to tropical waters and extending in habitat from Exmouth Gulf northwards. It is laid under contribution for the larger manufactured articles, such as dessert and fish knife and fork handles, large buttons, and inlaid work. The largest and finest pearls are obtained from it. The second species is that known commercially as the Shark Bay variety (*Meleagrina imbricata*). It is of smaller size and used chiefly for the manufacture of small buttons. The pearls found are of varying value. The Shark Bay pearlshell is collected by dredging in the deeper waters and gathered by hand from off the shallow banks at low tide.

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.

In-consistency with the "White Australia" policy, it has lately been urged that the employment of coloured labour in the pearl-shelling industry should be restricted, and white labour encouraged.

The heavy mortality amongst divers has led to suggestions for their medical inspection, and for the establishment of a school for training divers.

§ 2. Fisheries Statistics.

1. **Estimates for the Commonwealth.**—Statistics of the fishing industry have not hitherto been systematically collected. The returns given below have been furnished by the States departments, and estimates, where they have been made, are official. The data do not generally lend themselves to presentation on a uniform scheme. The principal facts have been compiled as far as possible for the Commonwealth; details for 1907 and 1908 will be found under the heading of the individual States.

GENERAL FISHERIES (EXCLUDING EDIBLE OYSTERS, PEARLSHELL AND BECHE-DE-MER), COMMONWEALTH, 1908.

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.	ddz.	£	£
New South Wales ...	1,163	*	2,093	92,600	11,031	70,000	2,760
Victoria ...	755	38,321	1,158	93,899	27,127	65,184	6,726
Queensland...	266	8,924	497	31,069	...	28,519	...
South Australia ...	487	19,834	538	25,796	14,000	34,756	3,677
Western Australia ...	296	21,328	539	29,720	10,000	49,533	3,000
Tasmania ...	94	7,520	282	17,800	...	11,400	...
Commonwealth ...	3,061	95,927†	5,107	290,884	62,158	259,392	16,163

* Figures not available.

† Exclusive of New South Wales.

EDIBLE OYSTER-FISHERIES, COMMONWEALTH, 1908.

State.	Number of Boats Engaged.	Value of Boats and Equip-ment.	Number of Men Em-ployed.	Number of Leases.	Length of Foreshore in Leases.	Oysters Taken.	
						Quantity.	Value.
	No.	£	No.	No.	Yards.	cwt.	£
New South Wales ...	*	*	*	2,042	597,495	15,374	26,900
Victoria ...	...	...	...	...	...	...	...
Queensland...	135	7,800	190	885	*	37,000	35,000
South Australia†	4	730	6	2	15 miles	550	728
Western Australia ...	...	...	...	...	...	...	...
Tasmania ...	...	...	...	...	...	...	...
Commonwealth ...	*	*	*	2,929	*	52,924	62,628

* Figures not available. † 1907 figures; no returns available for 1908.

PEARL, PEARLSHELL, AND BECHE-DE-MER FISHERIES, COMMONWEALTH, 1908.

State.	Number of Boats Engaged.	Value of Boats and Equip-ment.	Number of Men Em-ployed.	Quantity of Pearls-hell obtained.	Value of Pearls-hell obtained.	Value of Pearls obtained.	Value of Béche-de-mer obtained.
	No.	£	No.	Tons.	£	£	£
New South Wales ...	...	...	...	...	...	...	...
Victoria ...	...	...	...	...	...	...	...
Queensland...	204	61,200	1,300	424	50,514	20,000	21,631
South Australia ...	52	16,500	248	58	7,578	...	1,272
Western Australia ...	348	143,421	2,304	1,286	161,006	29,225	...
Tasmania ...	...	...	...	...	...	...	...
Commonwealth ...	604	221,121	3,852	1,768	219,098	49,225	22,903

PUBLIC REVENUE FROM FISHERIES, COMMONWEALTH, 1908.

State.	Licenses.	Leases.	Fines and Forfeitures.	Other Sources.	Total.
	£	£	£	£	£
New South Wales ...	1,044	4,771	117	694	6,626
Victoria ...	...	...	...	...	...
Queensland...	6,120	1,870	18	168	8,176
South Australia ...	368	...	...	...	368
Western Australia ...	789	360	25	...	1,174
Tasmania ...	538	...	8	23	569
Commonwealth ...	8,859	7,001	168	885	16,913

GENERAL AND OYSTER FISHERIES, COMMONWEALTH, 1904 to 1908.

Particulars.	1904.	1905.	1906.	1907.	1908.
General Fisheries*—					
No. of boats engaged ...	2,000	2,031	2,510	2,740	3,063
„ men employed ...	4,287	4,186	4,614	4,722	5,107
Fish obtained—					
Quantity ... cwt.	228,350	203,720	213,290	265,650	289,820
Value... £	133,300†	119,060†	132,190†	222,000	259,392
Lobsters obtained—Value, £	10,264†	9,496†	12,398†	11,460	16,163
Edible Oyster Fisheries*—					
No. of boats engaged ...	114‡	137‡	150‡	153‡	135‡
„ men employed ...	177‡	208‡	208‡	218‡	190‡
„ leases ...	876	801	870	1,229	...
Oysters obtained—					
Quantity ... cwt.	16,884§	18,572§	20,100§	79,832	1,185
Value ... £	19,000§	20,787§	22,509§	63,438	57,590
Public Revenue from Fisheries					
Licenses ...	£ 8,528||	9,221	8,200	8,419	8,891
Leases ...	£ 7,072||	6,268	6,939	6,699	7,001
Fines and forfeitures	£ 258||	162	388	208	168
Other sources ...	£ 341||	202	334	503	885
Total ...	£ 16,199||	15,853	15,861	15,829	16,945

* Exclusive of South Australia for 1904 and 1905 and of Tasmania from 1904 to 1907. † Exclusive also of New South Wales. ‡ Queensland and South Australia only. There are practically no oyster fisheries in Victoria, Western Australia, and Tasmania. § New South Wales only. || Exclusive of South Australia.

PEARL, PEARLSHELL AND BECHE-DE-MER FISHERIES, COMMONWEALTH,*
1904 TO 1908.

Particulars.	1904.	1905.	1906.	1907.	1908.
No. of boats engaged ...	837	741	603	-625	578
No. of men employed † ...	5,209	3,549	3,767	3,920	3,604
Pearlshell obtained—					
Quantity ... tons	2,271	1,813	1,747	2,034	1,768
Value ... £	255,755	196,874	187,323	249,115	219,158
Pearls obtained †—					
Value ... £	42,140	41,686	59,524	64,890	29,225
Bêche-de-mer obtained—					
Quantity ... tons	89	187	235	358	346
Value ... £	7,730	14,598	20,541	30,931	22,885
Tortoiseshell obtained—					
Quantity ... lbs.	2,209	2,543	3,659	3,437	5,056
Value ... £	1,027	1,370	2,007	2,042	2,776

* Queensland, Northern Territory and Western Australia only. There is no production in the other States. † Exclusive of Northern Territory. ‡ As returned.

2. **States Fisheries Statistics.**—(i.) *New South Wales.* Much of the information is approximate. From 1904 to 1906 the average numbers of men and boats employed in general fisheries were respectively 1730 and 849; the average annual quantity of fish marketed was nearly six million lbs. In 1907 the estimated number of men employed was 1935, and of boats, 1025; the take of fish was 124,078 baskets, averaging 75 lbs. each. In 1908 there were 1163 boats, worked by 2093 men, the take being 134,437 baskets of fish, 11,031 dozen lobsters, and 3478 baskets of prawns of 80 lbs. each. The approximate value in 1907 was £64,000, and in 1908 £72,760. The fisheries revenue over a series of years averaged £6000 annually, and was in 1908 £6626.

Considerable portions of the foreshores and shallow areas of the river estuaries are excellent natural oyster-beds, and with constant attention the annual yield of oysters could no doubt be materially increased. In 1907 the oyster leases covered 65 acres of deep water, and 553,975 yards of foreshore, and the yield was 14,406 bags, valued at £25,210. In 1908 there were leased 72 acres of deep water, and 597,495 yards of foreshore, from which 20,590 bags, value £26,900, were taken.

(ii.) *Victoria.* In 1908 a Fisheries Inquiries Board investigated the conditions of the fishing industry in Victoria. The scope of the inquiry covered questions as to the permanent and temporary closing of areas against fishing; the length and number of nets to be used by any one party; poaching; the destruction of cormorants; the appointment of local inspectors; adequate punishment for offences against the Fisheries Act; trawling and long line fishing experiments; and the handling, freight, and marketing of fish. The Fisheries Branch was, in 1909, transferred from the Public Works to the Agricultural Department, with a view to its reorganisation on the lines suggested in the Board's report. Legislation is proposed that is expected to result in the industry being considerably developed in the near future. The number of boats engaged in the industry average 700 over a series of years, and the men 1100. In 1907 there were 726 boats engaged, valued, with their equipment, at £38,666, and carrying 1153 men; in 1908, 755 boats, carrying 1158 men, and valued at £38,321. The take in 1907 was 99,707 cwt. of fish, valued at £60,442; and 24,889 dozen lobsters, valued at £6179. In 1908 it was 93,899 cwt. of fish, valued at £65,184; and 27,127 dozen lobsters, valued at £6726. Licenses to net in certain waters are issued without fee. These are not annual, but are supplemented every year by new issues. It is proposed to make the registration annual, and impose a fee. In 1907 a court case, which called attention to the fact that the necessary licenses had not been taken out in many cases, resulted in a large increase

in the issue of licenses. In 1906, 39 were issued to men and 38 to boats. In 1907 the numbers were 176 and 80, and in 1908, 83 and 45 respectively. There is no separate revenue credited to fisheries, the small amount derived by way of fines being credited to general revenue.

Annual leases have been granted to oyster fisheries, but the return has been insignificant. No leases were granted during the last three years.

(iii.) *Queensland.* Prior to 1907 no account was kept of the value of boats and equipment, but an approximation believed to be very close was furnished. Over a series of years the number of boats and men engaged in general fisheries averaged 250 and 500. In 1907, 242 boats, valued, with equipment, at £6596, and carrying 497 men, were worked; in 1908, 266 boats, valued at £8924, and carrying 497 men. The take in 1907 was 32,500 cwt., valued at £24,437; and in 1908, 31,000 cwt., valued at £28,519. There are no lobster fisheries. The amount put up in the fish-preserving establishments is not great, but the demand for fish locally tinned is growing. The revenue from fisheries in Queensland is considerable, and is chiefly derived from licenses. Since 1904 it has annually exceeded £7000, being in 1907, £7921, and in 1908, £8176.

For oyster fisheries, the deep waters in Moreton Bay and Sandy Strait are leased as dredge sections, which extend across the channels to the islands, and contain from 100 to 1000 acres each. Within these sections the majority of the oyster banks (ground containing up to 30 acres lying within two feet of low-water mark) are situated on the foreshores of the islands, and on the mud and sand flats. In 1907, 149 boats, valued at about £8000, and carrying 212 men, and in 1908, 135 boats, valued at £7800, and carrying 190 men, were engaged. In the former year 60,000 cwt. of oysters were taken, valued at £37,500; and in the latter year, 37,000 cwt., valued at £35,000. Leases granted numbered 924 in 1907, and 885 in 1908.

The year was a good one for the pearlshell industry. Good takes were registered, notwithstanding the industrial trouble early in the year. Prices also improved considerably, as much as £150 per ton being realised for pearlshell. During the last three years, however, there has been a considerable diminution in production, the number of boats and men engaged having been much fewer than in preceding years. In 1907, 211 boats, valued at £63,300, and carrying 1420 men, were employed. The take was 577 tons of pearlshell, valued at £70,495; 338 tons of *bêche-de-mer*, valued at £30,033; and 3095 lbs. of tortoiseshell, valued at £1927. In 1908, 204 boats, valued at £61,200, and carrying 1300 men, were engaged. The take was 424 tons of pearlshell, valued at £50,514; 322 tons of *bêche-de-mer*, valued at £21,631; and 4805 lbs. of tortoiseshell, valued at £2617. Prior to 1907, no record of the value of pearls obtained was kept, and it is impossible to estimate it. In the year named the value was approximately £30,000, and in 1908, £20,000.

(iv.) *South Australia and Northern Territory.* In 1907, 633 persons and 512 boats were engaged in general fisheries, the value of boats, equipment, etc., being £21,570. In 1908 the figures were 538 persons, and 487 boats, valued at £19,834. In 1907 the take was 20,734 cwt. of fish, valued at £25,121, and 1380 doz. of lobsters, valued at £369; and in 1908, 25,796 cwt. of fish, valued at £34,756, and 14,000 doz. lobsters, valued at £3677. In 1907, 840 fishermen's licenses were issued, and 820 in 1908. The revenue from general fisheries was £286 in 1907, and £368 in 1908, all from licenses. There are two fish-preserving establishments in the Northern Territory. Legislation to increase the powers of inspectors, and to enforce compulsory licensing of fishermen and boats in all cases is proposed, the necessary Bill having been introduced into Parliament in August, 1909. Oyster fishing has been introduced, but has not, up to the present, attained any great dimensions. In 1907, 4 boats and 6 men were engaged, and 416 bags were taken, valued at £728. For 1908 no figures are available. Revenue from oyster fisheries was £21 in 1907 from licenses, and in 1908 £32 from licenses and leases. In addition, £34 was collected from licenses in the Northern Territory in 1907.

In pearl-shelling, the limitation of shelling grounds and the scarcity of suitable labour has considerably hampered the industry, not more than half the fleet of boats having been engaged in late years. No pearls have been declared, but it is hardly possible that none were procured. It is believed that a quantity of pearls pass through the post-office without the knowledge of the Customs, and that dishonest divers send some away unknown to the boat-owners—in some instances by special messengers. There are indications that trepang fishing will receive more attention than hitherto from Europeans, in whose hands the whole of the industry is now held. The closing of the coast against the Macassar proas must necessarily cause a shrinkage, but it is expected that in the course of a year or two this will prove a great boon to local boats, inasmuch as it will give the fishing grounds time to recoup. Both the pearlshell and the trepang fisheries are capable of expansion. In 1907, 31 boats were engaged; pearlshell taken amounted to 64 tons, valued at £8805. Other products were:—342 lbs. of tortoiseshell, valued at £115; 38,976 lbs. of dried fish, valued at £322; and 20 tons of béche-de-mer, valued at £898. In 1908, 52 boats were licensed, valued at £16,500, crews numbering 248. During the year, however, many of the boats were taken off for want of men, others to carry on different work. The take was 58 tons of pearlshell, valued at £7578; 24 tons of béche-de-mer, valued at £1272; 83,900 lbs. of dried fish, valued at £1697; and 251 lbs. of tortoiseshell, valued at £159. Revenue from licenses amounted in 1908 to £59.

(v.) *Western Australia.* In 1907 there were engaged in general fisheries in Western Australia 235 boats, valued, with their equipment, at £16,500, and carrying 504 men; and in 1908, 298 boats, valued at £21,328, and carrying 539 men. The take in 1907 was 1500 tons of fish, valued at £50,000, and 10,000 doz. lobsters, valued at £3000. Revenue from fisheries amounted in 1907 to £787, and in 1908 to £1174.

In the pearl and pearlshell fisheries, 383 vessels carried crews aggregating 2500, a great number of whom were Asiatics; in 1908, 348 vessels carried 2304 labourers. The quantity of pearlshell obtained in 1907 was 1393 tons, and the value £169,815; in 1908 the quantity was 1286 tons, valued at £161,006. Pearls to the value of £64,690 and £29,225 were taken in 1907 and 1908 respectively. The béche-de-mer fisheries are little developed, and no produce of commercial value was obtained in 1907 or 1908, although in previous years small quantities have been marketed.

(vi.) *Tasmania.* The fishing boats and fishermen in Tasmania are not licensed, and no record is kept of them. The fish markets are under the control of the municipalities, and these do not keep complete records of quantities sold. The number of boats engaged in 1908 was 94, with crews aggregating 282. The estimated total value of boats and equipment was £7500. The estimated take of fish was 17,800 cwt., estimated value £11,400. There are no lobster fisheries. The revenue over a series of years averages about £600, mostly derived from licenses to angle for salmon and trout with rod and line. In 1907 the total receipts were £596; in 1908 £569.

Oyster fisheries are not worked except in a most primitive way.

The work of the Commissioner trends mostly in the way of breeding and distributing young fresh-water fish, especially acclimatised trout.

§ 3. Oversea Trade.

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 large, the export inconsiderable. The figures for the trade are as follows:—

IMPORTS OF FISH, COMMONWEALTH, 1904 to 1908.

Classification.		1904.	1905.	1906.	1907.	1908.
Fresh (oysters) ...	{ cwt.	9,468	8,195	9,225	12,288	9,702
	{ £	4,309	3,564	4,075	5,607	4,381
Fresh, smoked, or preserved by cold process	{ cwt.	8,403	11,386	9,591	14,060	19,311
	{ £	12,060	16,507	14,632	28,524	48,072
Potted ...	{ cwt.	†	†	†	†	†
	{ £	9,747	8,508	11,934	13,864	20,874
Preserved in tins ...	{ cwt.	106,007	120,213	135,872	127,555	144,750
	{ £	249,054	288,371	310,656	316,320	400,981
Dried or salted and n.e.i.	{ cwt.	15,736	16,992	17,336	14,843	19,349
	{ £	24,662	27,898	29,729	27,252	34,780
Total ...	{ cwt.*	139,614	156,786	172,024	168,746	193,112
	{ £	299,832	344,848	371,026	391,067	509,088

* Exclusive of potted fish. † Not available.

EXPORTS OF FISH 1904 to 1908.

Classification.		1904.	1905.	1906.	1907.	1908.
Fish, smoked, or preserved by cold process	{ cwt.	35	179	264	160	394
	{ £	48	287	468	296	1,230
Preserved in tins, dried, salted, etc.	{ cwt.	2,713	6,234	6,107	8,651	7,006
	{ £	12,485	22,499	24,559	38,977	23,299
Total ...	{ cwt.	2,748	6,413	6,371	8,811	7,400
	{ £	12,533	22,786	25,027	39,273	24,529

A considerable development has taken place lately in the fish preserving industry. Two factories were opened in the Northern Territory of South Australia in 1907, and a large output resulted from the operations of those previously established. There was, however, an excess of imports over exports amounting to £350,000 in 1907 and to £475,000 in 1908.

EXPORTS OF PEARLSHELL AND TORTOISESHELL, 1904 to 1908.

Article.		1904.	1905.	1906.	1907.	1908.
Pearlshell ...	{ cwt.	42,171	47,648	35,632	41,244	40,746
	{ £	244,679	252,895	212,242	252,063	250,901
Tortoiseshell ...	{ lbs.	3,616	4,139	4,835	3,566	5,310
	{ £	2,167	2,812	2,507	2,192	2,783

§ 4. Development of the Industry.

1. **Transport and Marketing.**—The large importations of fish into the Commonwealth indicate the scope for the development of the local fishing industry. How to secure a regular supply of wholesome fish at a moderate price has been a problem for years. 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. At the present time the natural wealth of Australia in fish is exploited only to a very slight extent. The daily supply of fish in Great Britain is 300,000 tons, and the deep sea fisheries cover an enormous area.

2. **Experiment and Culture.**—(i.) *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, but much yet remains to be done before the industry is at all commensurate with the industrial progress and consuming capacities of the Commonwealth. 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 in its efforts to increase the productiveness of the Commonwealth waters, and the research work generally undertaken by it; and that uniform fisheries laws should be adopted by adjacent States. The existing fishing is inshore, the supplies being obtained from the vicinity of river estuaries and lakes. Deep-sea fishing, as established and carried on in older countries, is, so far, practically non-existent in Australia. It has been established that the deposits of fish eggs generally float upon the water. The drift of currents or the influence of winds often carry them a considerable distance from the shore, thus affording very little chance of development. The problem that is now engaging experts all over the world is how to artificially control the drift of eggs, so that the fish may be hatched near shore under the most favourable conditions.

(ii.) *New South Wales.* In New South Wales, trawling experiments have shewn that considerable areas along the coast are suitable fishing grounds, but practical work on commercial lines is yet undeveloped. The stocking of rivers and lakes was begun by private enterprise, since which Government aid has been granted, and eminent success has been attained, among other fish, with the Californian rainbow trout. Young fry are distributed annually from the trout hatchery at Prospect, and the natural reproduction of the fish in the streams that issue from the mountain ranges is regarded as a valuable asset. In 1902 attempts were successfully made to transport European fishes alive to Australia. A marine hatchery and biological station has been completed at Gunnamatta Bay, Port Hacking, by means of which it is proposed to gradually acclimatise suitable fishes. The output of ova and fry last season was in excess of that of previous years. The natural oyster beds are also being extended. In September, 1909, a Fisheries Exhibition was held at Sydney, to shew the resources of the State.

(iii.) *Victoria.* In Victoria very little has been done in the way of hatcheries and culture, and that has been mainly the work of private individuals and angling clubs. The Government has, however, incurred the expenditure of a sum of money on hatcheries with good results. Fry and yearlings are distributed, and one consignment of the latter was despatched from the Geelong hatchery and liberated without loss at Mundaring, Western Australia. Young rainbow and Loch Leven trout are also released into the rivers of the State from the hatcheries lately established at the Zoological Gardens. Trawling experiments were conducted some years ago, but the results were inconclusive.

(iv.) *Queensland.* In Queensland artificial hatching was undertaken by the Acclimatisation Society of Southern Queensland. Here, also, the American rainbow trout has succeeded, fry being distributed from the hatchery at Spring Creek, Killarney. The lung-fish, formerly known only in two streams, has been successfully transplanted to several other streams. Oyster beds are also being developed in several parts, and improved methods of culture have largely increased the output. The trawling experiments of 1901 and 1902 point to the improbability of a great trawling industry being established. The trawling area off Queensland would be a mere strip, because of the presence of the coral region immediately to the north and the fact that the sea deepens very rapidly to the east.

(v.) *South Australia.* In South Australia the indiscriminate exploitation of the Port Lincoln and adjacent oyster beds led to the necessity for their being closed from time to time to prevent the district from being altogether worked out. The future outlook has in this way been improved as regards oyster culture. The South Australian fishing grounds have been stated to be most desirable areas, only wanting men and boats to ensure a large take. Trawling by private individuals has led to satisfactory results. The question of establishing a floating hatchery is under consideration.

(vi.) *Western Australia.* In Western Australia the coastal waters have been examined to ascertain whether suitable trawling grounds exist. The Acclimatisation Committee has successfully hatched and liberated trout, the Mundaring weir being stocked with the Loch Leven variety. Perch were stocked in the lakes near Wanneroo Caves.

(vii.) *Tasmania.* Considerable distributions of ova and fry are annually made from the River Plenty in Tasmania. Besides the supplies to Tasmanian waters, the northern States are also recipients of ova.

(viii.) *Commonwealth Investigations.* The Federal Council has power to legislate with regard to fisheries in Australasian waters beyond territorial limits. In the 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. It was not till 1908, however, that the Federal Government commenced operations in regard to fisheries. A fisheries investigation vessel (the F.I.S. *Endeavour*) has been built and launched. Its general object is to find out what fish occur around Australian coasts, and how to catch them. Trawling, whereby the fish are disturbed by a large bag-shaped net which is drawn along the sea-bottom, and caught and retained in a trap arrangement at the tail-end of the net, forms one of the branches of experiment. Work will also be carried on in all known and recognised methods of capture, including long-line and drift-net fishing, etc.; and survey, hydrographic work, etc., is carried out, so as to get information as to the nature of the bottom, depth of water, currents, and sea temperature. In the report of the first six months' work of the trawler, it is stated that suitable and unsuitable grounds were met with in all parts. Not all suitable grounds are rich in life. Over vast areas the bottom consists of coarse "hungry" sand, which is almost barren and desert like, while in other instances the sand is covered with quantities of sponges and other growth. But large catches have been frequently taken, and areas have been located suitable for trawling and prolific in food fishes. The *Endeavour's* catches have been distributed amongst various charities.

(ix.) *Inquiries by Scottish Fishermen.* In the latter half of 1908 a delegation of Scottish fishermen visited Australia to make inquiries regarding the possibility of the remunerative working of the Australian fisheries. They appeared to be impressed with the excellence of the fishing grounds, and have reported favourably on the proposal to settle colonies of fishermen, with their wives and families, on the coast, and establish industries for fish catching, smoking, curing, etc., and for manufacturing fertilisers, fish oils, and fish cakes.

§ 5. Fish Preserving.

Bounties have been provided by the Federal Government for fish preserving. These, together with the increased yield that may be expected as a result from the fisheries investigations now being conducted, will probably 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 at the present time are very few:—

NUMBER OF FISH-PRESERVING ESTABLISHMENTS, 1904 to 1908.

State.	1904.	1905.	1906.	1907.	1908.
New South Wales ...	2	2	2	1	1
Victoria ...	...	...	...	...	...
Queensland ...	4	4	4	4	5
South Australia ...	...	...	...	2*	2*
Western Australia ...	3	3	3	3	3
Tasmania...	1	1	...	...	...
Commonwealth ...	10	10	9	10	11

* These are in the Northern Territory.