

## STRAITS SETTLEMENTS AND FEDERATED MALAY STATES.

### ANNUAL REPORT ON THE FISHERIES DEPARTMENT FOR THE YEAR 1924.

#### ECONOMIC INVESTIGATIONS.

1. Preliminary investigations into a number of subjects, which may be classified generally as fisheries economics, were made during the year. These included enquiries regarding salt and dry fish, fishery salt, canning, pearl-shell, agar-agar and crocodile leather.

#### SALT AND DRIED FISH.

2. The importance of the trade in salt and dried fish is shown by the figures for British Malaya of the Registrar of Imports and Exports:

Year.	Imports.		Exports.	
	Tons.	Value. \$	Tons.	Value. \$
1923 ...	37,611	10,914,220	... 45,575	18,016,868
1924 ...	47,866	12,436,951	... 54,996	14,499,979

The graph given as appendix I shows the countries from and to which this salt and dried fish is sent. The largest import nearly 50 per cent. comes from French Indo-China (23,645 tons) with Siam and Siamese States (17,713 tons) next. The Netherlands East Indies is outstandingly the country of receipt of British Malayan exports of this article (48,848 tons).

#### SALT.

3. The fish caught on the east coast by the Japanese fishermen is marketed fresh in Singapore. This is effected by the use of ice and motor carriers. For the rest with the exception of the small quantity consumed locally and some boiled fish exported to Singapore, all the fish captured on the east coast of the Peninsula is salted and sun-dried. In certain areas on the west coast, of which the most prominent is Pulau Ketam, considerable quantities of fish are salted down and sun-dried. The quality of salt obtainable for this industry is, consequently, of great importance.

Salt was imported in 1924 into British Malaya almost entirely from Siam and Siamese States (56,925 tons) and Egypt (7,922 tons).

A number of samples of salt used for fish-curing in Malaya were kindly analysed on behalf of the Fisheries Department by the Government Analyst, Singapore. The results of the analysis of nine of these samples and the analysis of a British fishery salt are given as appendix II. It has been shown, that the most satisfactory salt for fish curing is the one with the highest percentage of sodium chloride and the smallest of the chlorides and sulphates of magnesium and calcium and other impurities. Magnesium and calcium salts tend to retard the penetration of the salt and to give the salted fish a bitter and unpleasant taste. The salts used locally have a high percentage of magnesium and calcium salts and of insoluble and organic matter. A description of the Siamese salt industry has kindly been provided by the Consul-General for Siam and his assistance has been sought in procuring samples directly from some of the better pans and mines. On receipt, these will be analysed. It may then be possible to arrange for the supply of a better quality fishery salt without marked enhancement of price. Enquiries are also being prosecuted with regard to the supply of a better quality salt from Egypt.

#### CANNING.

4. No Malayan fish is tinned. Yet canned fish find a ready market even in Malayan fishing villages. Few sundry goods shops in such villages are without those large oval tins of large sardines imported from California. This canned fish is cheap even to the fisherman and is of good quality.

There are certain Malayan fish caught in sufficient quantities even by present methods and sufficiently cheap to satisfy the preliminary requisites of a successful cannery. The most universal of these is a small anchovy named "bilis" or "bunga ayer" in Malaya. They are mostly species of "stole phorus." The numerous kelong or fishing stakes round the Island of Singapore catch little else.

A small scale experiment in canning these tiny fish was carried out on the fisheries vessel the S.L. "Shark." The cans were purchased ready made from pineapple factories and elsewhere; a manual double-seaming machine was borrowed and the remaining necessaries, including a small portable auto-clave for processing, were purchased at small cost. Owing to the early deterioration after death of these delicate fish, the "Shark," was anchored alongside a "kelong" and the catch transferred from the "kelong" as soon as made and immediately treated for canning. It was found necessary to behead and gut the fish, as the gall-bladder rendered the canned fish bitter. The product so treated, canned well and tasted well. Owing to the poor adjustment of the double-seaming machine, a considerable number of the cans were improperly closed and later became blown. The experiment demonstrated the advisability of obtaining a small plant capable of being carried on the "Shark." Canning demonstrations at fishing villages of suitable fish caught cheaply and in sufficient quantities by the fishermen of such villages will be made possible by such a plant. There seems to be no reason why canned fish should not, partially at any rate, supplant the salt and dried fish of the eastern dietary. Five thousand two hundred and eighty-three tons of sardines were imported from the United States of America during the year. Other countries provided 98 tons only. A total of 2,704 tons were re-exported.

#### COLD STORAGE.

5. There are good prospects of the erection by private enterprise of a small cold storage in the neighbourhood of the Clyde Terrace Market, Singapore, with provision for keeping fish chilled. This is likely to be a welcome addition to the facilities of the market and will enable the stall-holders and wholesale vendors to spread occasional gluts of fish over a number of days.

The sharp freezing and cold storage of fish captured locally does not promise to be commercially remunerative for the present except on a very restricted scale. The supply of fish of a size, nature and price suitable for cold storage is inadequate. On the east coast, the fishing is confined to the south-west monsoon and the majority of fish caught are small. On the west suitable fish are consumed without difficulty by the fresh fish market at a price unremunerative for cold storage. In one or two places such as Pulau Ketam a considerable quantity of suitable fish is salted down and sun-dried. The question of a small cold storage at Port Swettenham to deal with the fish from Pulau Ketam was still under consideration at the close of the year. Matters may be very different, if modern power methods supplant to any extent the present system of fish capture.

#### PEARL-SHELL.

6. Small quantities of shell suitable for the pearl-button industry are obtained off the islands of the east coast and off Pulau Sembilan on the west. As far as is known these seas have not been tested by properly-equipped divers. A proposal for the financing by Government of a properly equipped pearling lugger was considered, but, in view of the claims of many other and more promising fishery investigations, was not proceeded with.

The shell dealt with in Singapore comes from India, Burma and many places in the Malaya Archipelago. Many of the importers of this shell were interviewed and the trial of a small experimental and inexpensive button factory was suggested. The main importer was not in favour of the proposal, owing to the recent establishment of American pearl-button factories in the Philippines. The Imports and Exports Returns show that an average of 25,261 pikuls of shell were imported yearly during the period 1910-1919. In 1920, 1921, 1922 and 1923 the amounts imported were 18,498, 12,131, 14,622 and 12,558, respectively. There has been a remarkable and sudden decrease in the amount of shell imported, which the main importer attributes to the diversion of the trade to the Philippines.

#### EXPERIMENTAL STATION.

7. The sheds at Telok Ayer, Singapore, were taken over from the Supplies Department towards the close of the year. It is proposed to erect a smoke-house and artificial drying room and to test on a small scale the suitability or adaptability of the methods of other countries in salting and drying, smoking, pickling, dehydrating, and manufacture of fish meal, guano, oil, etc., for the Malayan fisheries.

#### POND CULTURE.

8. A large number of returns on pond culture were received from the greater part of British Malaya. These returns were not sufficiently complete or reliable for statistical purposes, but proved the extensiveness of this industry. An investigation into the details of the culture and sale of fish reared in ponds in Singapore had not been completed by the end of the year.

## PRICE OF FISH.

9. It is not possible to compare the prices of British and Malayan fishes with certainty, as so few of them are identical or even somewhat similar. Appendix III compares the prices fetched at auction in the fish markets of Billingsgate (London) and Clyde Terrace Market (Singapore) of fish of an equivalent nature. As far as such fish can be considered to be equivalent, Malayan fish are dearer, often twice as dear, and prawns and shrimps and crabs cheaper than English fish and similar crustacea.

## FRIED FISH SHOPS.

10. The Ministry of Food returns showed that about one-fourth of the fish consumed in Great Britain was sold from fried fish shops. These shops provide a cheap, wholesome and nutritious meal for the less wealthy classes both from the counter and in the shop itself. They make use largely of less popular though equally nutritious fish. Of these there are a number in Malaya, the capture of which would be stimulated by a greater demand and somewhat better prices. The Asiatic population in the bigger towns of Malaya moreover, consumes an unusual amount of food cooked away from home. There is consequently a field of utility and profit for fried fish shops in many parts of the Peninsula. Methods of cooking and ingredients employed by eating shops and hawkers in Singapore were under investigation during the year, so that adaptations of the fried fish shop methods of Great Britain suitable to local conditions might be ascertained. A fried fish and chips shop was opened towards the close of the year in the Tanglin district by a European.

## PLANKTON.

11. Fishery officers were supplied during the year with plankton nets, formalin, bottles, etc., and given instructions with regard to the collection of this minute often microscopic, drift of life of the sea. Being incomparably the most important source of food of edible fish, its distribution and nature is an economic factor calling for investigation. A systematic daily collection by each of the three motor cruisers along the west coast between Penang and south of Malacca was initiated but imperfectly carried out. There is no one competent in the department to do more than very roughly classify the contents of such collections. A specialist is required and if engaged some years hence, he will have a quantity of material ready to hand giving seasonal variation over a number of years.

## STATISTICS.

12. One of the objectives of fishery statistics is the ascertainment and comparison of the quantities of different kinds of edible fish caught monthly and yearly, so as to provide data, upon which commercial projects may be based and from which scientific enquiry regarding migration, fluctuations, conservation, etc., of fish may start. Their accurate compilation is a matter of great importance, but is unfortunately of great difficulty in Malaya. The only reliable system is ascertainment of the catch, when first landed. Much detailed and difficult organisation is required for this in Malaya. A plan of organisation was sketched out during the year and will be given a trial in 1925. The Federated Malay States Government approved of the appointment of a Malayan-born Chinese Fishery Inspector, one of whose duties will be the checking and the organisation of the statistics for the Federated Malay States. Both the Fisheries Enactment, 1923, and the Fisheries Ordinance, 1924, give power to call for returns from fishermen and fish-dealers. Returns of the fish sold in the markets of the bigger towns of the Peninsula and of the salt and dried fish exported from Federated and Unfederated Malay States were received during the year. They are, however, too incomplete to form a statistical record of the catches of the Peninsula. Reliable statistics of the quantity of fish sold in the Singapore markets are obtainable from the Municipal market returns. Appendix IV gives the weight and place of origin of the fish bought in the Singapore Municipal Markets. The Dutch Islands provided 73 per cent. of the fish so sold, while less than 17 per cent. was caught in local waters. The daily average consumption is about 295 pikuls or 17 tons 11 cwt. If boiled fish can be considered fresh fish, considerable additions to the above figures must be made, to obtain the total consumption of fresh fish in Singapore. The numerous "kelong" or fixed engines about Singapore catch little else than a small anchovy known as "bilis." At certain times of the year sardines in considerable quantities are caught as well. The "bilis" is boiled, as it spoils quickly. Both it and much of the sardine catch does not come on to the markets. During the south-west monsoon, moreover, very considerable quantities of boiled fish are imported from the east coast which also do not come on to the markets.

## EXPERIMENTAL VESSEL.

13. After consideration of the particulars of the experimental vessel by the Ministry of Agriculture and Fisheries, a cable was received recommending the purchase of a new vessel delivered in Singapore for £19,500. A vessel, designed to include modifications deemed necessary in Malaya, was considered to be better value than a modified second-hand castle-type trawler. The considerable increase in initial cost was agreed to and the necessary sum has been included in the 1925 Estimates.

## OTHER CRAFT.

14. The Director was away from head-quarters in the s.l. "Shark" for various periods totalling to over three months for the year. During these periods many of the fishery villages up to Alor Star on the west and Tumpat on the east coast were visited. The s.l. "Shark" was also employed by the Senior Fishery Officer for licensing areas in Singapore waters. She is not, however, suited for the class of work required by a Fishery Officer. The three motor cruisers on the other hand used by the Fishery Officers on the west coast have proved themselves well-fitted for the work, for which they were designed. They are extremely lively but sea-worthy and dry boats. Appendix V gives details of expenditure.

## LAW.

15. The Fisheries Ordinance, 1924, came into force on 15th September, 1924. It is similar though not identical with the Fisheries Enactment, 1923, which came into force in the Federated Malay States on 9th January, 1924. Rules both under the Ordinance and the Enactment identical in most respects came into force during the year. Identical licence fees for fishing gear are now payable in the Federated Malay States and Colony.

## STAFF.

16. The Director was the only European in the department during the year. None of the Asiatic staff possesses either technological or scientific fisheries education. Problems requiring solution are the adaptation of the present style of fishing to the use of power, the application of the technological methods of other countries as regards preservation and distribution of catch, curing, canning, cold storage, etc., etc., to the local fisheries and the scientific investigation of the sea in connection with edible fish. A number of specialists in each of these divisions will be required. A fisheries economist was chosen in England towards the close of the year and should be in Malaya early in 1925. Enquiries were made in Japan regarding the possibility of recruitment there. It was thought that the adaptation of European and American methods carried out in Japan might be suitable to Malaya. Language difficulties and mental orientation together with the high rate of salary sought, however, makes this an unlikely field of recruitment. Mr. Lim Teck Lye was appointed to the vacant post of correspondence clerk on the 20th March. Inche Ahmad bin Krani Man was appointed Fishery Officer, Singapore, on the 12th of June. On the 1st October he was appointed Fishery Officer South in place of Inche Mohamed bin Lebai Isa, resigned. The post of Fishery Officer, Singapore, was filled by Mr. V. K. Tampi. Mr. Seng Yew Liang was appointed Chief Clerk from the 19th August, *vice* Mr. Tan Guan Hoe.

## REVENUE.

17. The revenue collected for the years 1922, 1923 and 1924 under the headings fees for fishing gear and boats is given in the table below :

Settlement or State.	Fees for fishing gear.			Fees for fishing boats.		
	1922.	1923.	1924.	1922.	1923.	1924.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Singapore ... ..	2,081 00	2,196 00	1,492 42	152 00	194 00	564 00
Penang ... ..	9,898 00	10,398 00	7,911 56	1,768 00	1,823 00	1,728 00
Dindings ... ..	732 50	1,121 00	1,424 75	316 00	423 50	412 50
Malacca ... ..	1,364 00	1,737 50	1,161 31	398 00	420 00	422 00
Perak ... ..	13,478 00	18,905 00	17,484 00	610 00	620 00	508 50
Selangor ... ..	11,212 00	14,480 00	13,648 00	594 25	627 00	551 50
Negri Sembilan ... ..	184 50	236 25	289 75	50 00	59 75	56 90
Pahang ... ..	24 85	34 00	35 00	258 00	296 25	
Total ... ..	38,974 85	48,107 75	43,446 79	4,146 25	4,464 50	4,243 40

The total revenue for the Colony was \$15,124.54 and for Federated Malay States \$33,199.23, being revenue collected for fishing boat and gear licences together with other revenue \$633.58. The decrease in revenue is mainly due to fees for fishing gear having been collected in the Colony for three quarters of the year only. The financial year for licence fees in the Colony ended, until 1923, on the 31st March. Under the new Fisheries Ordinance the financial year coincides with the solar year.

## EXPENDITURE.

18. Expenditure from the votes allocated to the Fisheries Department for the year in the Estimates amounted to \$45,916.40 against a total revenue of \$48,333.79. Of this expenditure \$25,675.66 was on the joint account of the Colony and Federated Malay States, the former being debited with \$13,437.83 and the latter with \$12,237.83. The expenditure incurred on the separate accounts of the Colony and Federated Malay States was \$6,580.34 and \$10,660.40, respectively.

## FISHERMEN.

19. The approximate number of professional fishermen in the Settlements and States of the Colony and Federated Malay States are given below :

Settlement or State.	Malay.	Chinese.	Japanese.	Tamil.	Others.
Penang ... ..	3,576	2,530	...	278	
Dindings ... ..	1,403	424	...	495	
Malacca ... ..	2,441	465	...	8	115
Singapore ... ..	1,235	1,750	215	...	1
Straits Settlements ... ..	8,655	5,169	215	781	116
Perak ... ..	1,980	5,573			
Selangor ... ..	2,307	6,588			
Negri Sembilan ... ..	110	473			

SINGAPORE,  
March, 1925.

C. F. J. GREEN,  
Director of Fisheries, S.S. & F.M.S.

## APPENDIX II.

Analysis of ten samples of salt by the Government Analyst, Singapore.

No.	Sample salt.	Calcium sulphate per cent.	Calcium chloride per cent.	Magnesium sul- phate per cent.	Magnesium chlo- ride per cent.	Sodium carbonate per cent.	Sodium chloride per cent.	Insoluble and organic matter and other salts.	Total.
1	British fishery salt ...	0.07	0.11	...	0.03	0.05	99.72	0.02	100
2	Egyptian salt ...	0.65	..	0.12	0.39	0.04	98.10	0.70	..
3	Siam salt ...	0.51	..	0.36	0.63	0.02	98.30	0.18	..
4	" ...	0.71	..	0.09	0.41	0.01	97.77	1.01	..
5	" ...	0.46	..	0.27	0.53	0.02	97.31	1.41	..
6	" ...	0.28	..	0.45	0.73	0.06	96.65	1.83	..
7	" ...	0.54	..	0.49	1.02	0.02	95.74	2.19	..
8	" ...	0.62	..	0.47	1.28	0.01	95.18	2.44	..
9	" ...	0.44	..	0.75	1.33	0.02	94.26	3.20	..
10	" ...	0.65	..	0.93	1.52	0.03	93.29	3.58	..

In samples 7 and 10 the insoluble matter amounted to 1.00 per cent. and 0.96 per cent., respectively.

In all the others, excepting 1 and 3 it amounted to 0.5 per cent. approximately.

In sample 10 0.08 per cent. of iron and aluminum was found.

## Statement showing wholesale price of fish per katty in cents at the Clyde Terrace Market compared with those at Billingsgate. Those with English names refer to Billingsgate.

	1923.												1924.			
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Average for 13 months.		
															Oct.	Nov.
Soles	107	118	78	77	71	74	96	72	85	108	133	119	136	98	106	94
Lidah	85	98	99	91	87	95	100	100	94	95	80	90	91	92½	106	94
Plaice	46	46	55	41	42	46	43	44	36	46	36	39	51	44	40	37
Sabblah	39	31	35	30	31	32	34	34	37	36	35	35	32	34		
Haddock	14	14	22	26	27	26	28	22	19	17	14	17	19	20	50	44
Parang	42	34	38	37	32	39	37	36	42	40	38	37	40	38		
Cod	16	18	19	25	15	15	11	9	9	12	11	16	21	15	35	35
Tembereh	...	...	...	...	...	...	...	...	34	33	32	36	32	33		
Herring	11	11	11	12	18	11	13	15	17	9	10	10	14	12½	32	29
Terubok	26	23	26	27	24	28	28	27	27	27	26	30	27	26½		
Mackerel	15	18	25	20	22	18	20	17	16	18	16	15	17	18	52	51
Tenggiri	50	45	45	47	49	43	41	41	43	44	43	45	42	44½		
Bream	8	9	9	9	9	10	10	14	14	9	8	9	9	10	19	20
Delah	20	18	19	19	20	19	20	8	18	17	17	19	9	19		
Conger	12	16	19	24	16	13	13	12	11	9	10	11	14	14	29	22
Malong	21	19	19	26	17	17	18	17	21	21	20	22	21	20		
Salmon	193	...	...	...	...	156	180	158	135	132	101	112	...	146	49	48
Kurau	45	42	41	48	41	40	44	41	43	44	43	46	42	43		
Crab	42	45	43	52	49	42	41	48	35	42	38	26	43	42	33	33
Ketam	35	34	38	34	31	36	33	38	35	33	30	33	34	34		
Prawn	209	232	270	250	332	363	399	224	245	271	423	342	282	295½	75	72
Udang Besar	54	75	82	72	60	64	72	71	70	71	75	74	81	71		
Shrimp	12	11	14	12	26	27	34	15	17	18	17	12	15	17½	41	41
Udang Kechil	39	40	45	45	32	38	38	36	36	36	41	41	42	39		
Oysters	746	927	927	927	927	927	927	927	831	...	...	...	922	899	55	55
Tiram	62	67	67	67	70	70	70	70	70	59	60	55	55	65		

Prices for Temberek began to be taken from May, 1924, only.

## APPENDIX IV.

## Quantity and origin of fish bought in the Singapore Municipal Markets.

Place of origin.	Total weight in pikuls of fresh fish sold in 1924, in the markets of:					Totals pikuls.
	Clyde Terrace.	Ellen borough.	T. Ayer.	Orchard road.	Kandang Kerbau.	
	Pkls. kts.	Pkls. kts.	Pkls. kts.	Pkls. kts.	Pkls. kts.	Pkls. kts.
Local waters... ..	9,197 68	4,639 48	1,950 34	829 56	1,646 74	18,263 80
Federated Malay States ... ..	...	1,925 84	...	...	...	1,925 84
Johore (Cucob) ... ..	1,924 65	4,873 29	...	...	...	6,797 94
Trengganu ... ..	2,052 50	...	...	...	...	2,052 50
Dutch Islands of:						
1. Batam ... ..	6,944 02	...	...	...	...	6,944 02
2. Kerimun ... ..	2,304 00	6,998 86	...	...	...	9,302 86
3. Sambu ... ..	7,653 84	...	...	...	...	7,653 84
4. Rhio Straits... ..	...	21,903 45	...	...	...	21,903 45
5. Moro... ..	20,329 99	9,801 86	...	...	...	30,131 85
6. Sugi ... ..	2,712 00	...	...	...	...	2,712 00
Total all sources ... ..	53,118 68	50,142 78	1,950 34	*829 56	* 1,646 74	107,688 10

\* This is exclusive of the fish received from other Singapore markets and already included in the figures for such markets. The Orchard Road Market received 4,068.74 pikuls and Kandang Kerbau 5,049.40 pikuls from the other markets. The total imported from the Dutch Islands amounted to 78,648.02 pikuls.

## APPENDIX V.

## Costs of the Fisheries Motor Cruisers.

Name of motor cruiser.	Cost of crew (wages, allowances, clothing).	Fuel, etc.	Stores upkeep repairs.	Total cost.	Miles travelled.	Cost per mile.	
						Exclusive of cost of crew.	Inclusive of cost of crew.
	\$ c.	\$ c.	\$ c.	\$ c.		c.	\$ c.
Terubok ... ..	1,565 69	573 73	350 59	2,490 01	2,176	42	1 14
Tenggiri ... ..	1,756 55	945 48	348 67	3,050 70	3,784	32	0 81
Talang ... ..	1,715 13	893 56	168 32	2,777 01	3,097	34	0 90