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# Government of Madras

DEVELOPMENT DEPARTMENT

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**G.O. No. 1895, 8th November 1928**

Fisheries—Administration Report for 1927-28—Recorded  
with remarks.

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READ—the following :—

Letter from Dr. F. H. GRAVELY, D.Sc., Director of Fisheries, Madras,  
to the Secretary to Government, Development Department,  
dated 1st October 1928, Ref. No. 1802-G.

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**Order—No. 1895, Development, dated 8th November 1928.**

Recorded.

2. Owing to the handsome revenue obtained from the two pearl fisheries held during the year the transactions of the department resulted in a profit of Rs. 99,169. The working of the chank fisheries and of the Aquarium also brought in increased revenue as compared with the year 1926-27. Small profits were derived from the Tanur station and the Zoological Supply section. The Inland section which is one of the chief revenue-producing sections, however, sustained a loss of Rs. 12,948 during the year owing to the failure of the north-east monsoon. The cannery and oyster farm also worked at a loss. The former has not yet recommenced manufacture and practically all the stock of canned goods has been disposed of though at considerably reduced prices.

3. Towards the close of the year, the Government appointed a committee of officials and non-officials to examine the work of the department and report on the future policy to be adopted for its working and improvement. The sittings of the Committee terminated with the departure of the President to Geneva, and their report is awaited.

4. Experiments were conducted at Tanur on the proper methods of skinning and curing of sharks and for the determination of the

proper proportion of salt for shelled prawns and mullan in wet and dry weather and for mackerel under Ratnagiri cure. Owing to the failure of the sardine fishery, only 156 private oil and guano factories out of 470 factories actually worked during the year. The value of their output was only about a third of that of last year's output.

5. The two pearl fisheries held during the year which, from the financial point of view, form the biggest of the pearl fisheries since 1801 brought in a net profit of Rs. 3,38,931. The first fishery lasted from 9th November 1927 to 14th January 1928, while the second, which commenced on 1st March 1928, had to be abruptly closed on account of an outbreak of cholera in the camp on 7th April 1928. Though the two pearl fisheries extended practically throughout the whole season, chank fisheries were held both at Tuticorin and on the Rāmnād coast in the interval between the two pearl fisheries and immediately after the closure of the second fishery. The net receipts obtained amounted to Rs. 31,775 against Rs. 19,472 in 1926-27.

6. The revenue from the inland fisheries fell from Rs. 1,05,254 in 1926-27 to Rs. 1,01,257 in 1927-28, due mainly to the failure of the north-east monsoon, while the expenditure rose from Rs. 1,01,818 to Rs. 1,14,205 resulting in a net loss of Rs. 12,948. During the year some of the ponds in the Mopad and Praema fish farms were brought into working order and stocked with gourami and etroplus. The deep-water fishing experiments at the Mopad farm were satisfactory and the Government are glad to note that local fishermen are benefiting by the new methods of fishing introduced in this farm. The disastrous cyclone which passed over the Nellore District in November 1927 damaged the Ippur farm buildings considerably; the watchman's quarters and store-sheds in the Mopad farm also sustained slight damages; the work of repairing the buildings is in progress. Since the close of the year the Legislative Council has passed certain amendments to the Indian Fisheries Act which will be useful to put an end to poaching in public waters and to protect the interest of lessees and licensees.

7. Owing to the favourable fishing season, the operations in the yards on the west coast nearly doubled, while the operations in the yards in the Northern Circars and in the Nellore District showed a decline due partly to the poor fishing season, and partly to the effects of the cyclone already referred to. The Government consider that steps should be taken to improve the working of the

yards which have been showing a loss in recent years, or to close them and open new ones in centres where they are likely to prove of greater use to the fishermen. The yards at Pulicat and Sattankuppam on the east coast and Mattool, Badagara, Ponnāni and Uppala on the west coast do not appear to be working satisfactorily, and the Director is requested to submit a special report on their working during the last five years with suggestions for their improvement. The expenditure during the year was comparatively high due to heavy transport charges that had to be incurred on a large quantity of salt carried by rail to the west coast to meet urgent demands. The working of these yards cost the Government Rs. 4,56,050 in the year, while the revenue amounted to Rs. 4,40,393.

8. The trawler made half a dozen experimental fishing cruises off Madras and sixty hauls off Manapad, Cape Comorin and Calicut. The results of the hauls are explained in the Director's report. The use of the vessel for conducting on any great scale deep-sea fishing experiments is greatly handicapped for want of better-ventilated cabins for the crew, a laboratory, a refrigerator and cold store room. The provision of these improvements is under consideration.

9. The Marine Aquarium at Madras continues to be popular and brought in increased revenue during the year.

Sardine and mackerel investigations were continued at the West Hill Research Station, Calicut. At Vizagapatam the work of collection and identification of the common edible fish in the Circars was carried on. A small laboratory is being established at Krusadai Island mainly for the study of problems connected with the pearl and chank fisheries.

10. The combined oyster and biological specimen supply section worked at a loss of Rs. 1,257. The transactions relating to the supply of biological specimens were self-supporting, while the oyster supply operations sustained a loss of Rs. 1,264 owing to the scarcity of marketable oysters in the Ennuf beds which alone were worked as the Pulicat beds were given rest during the year.

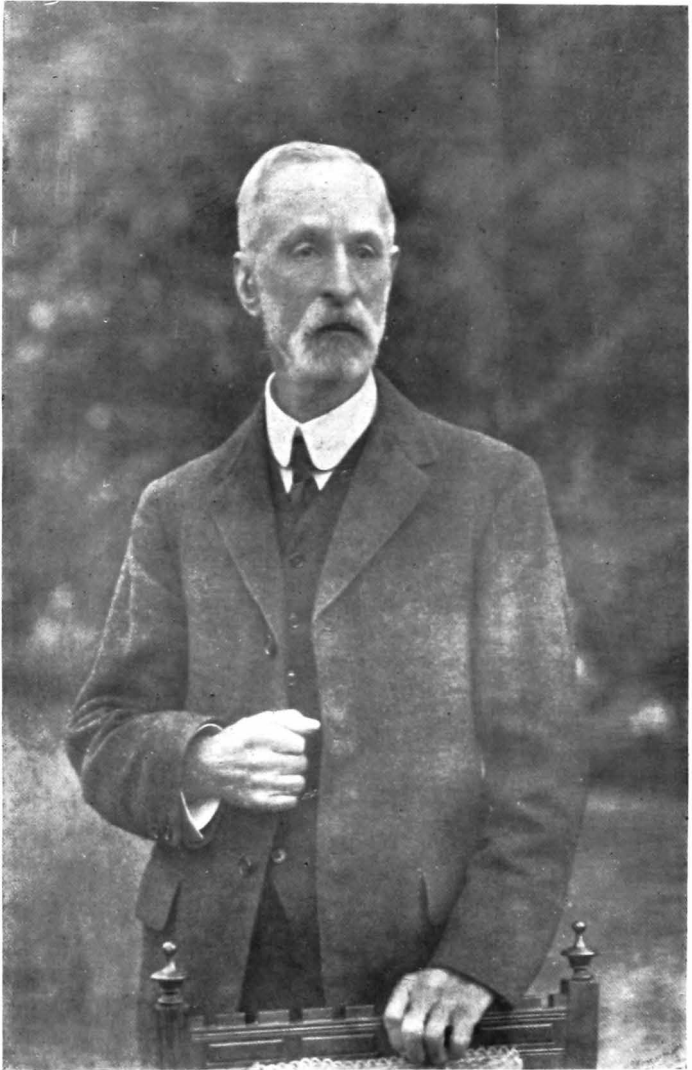
11. On the socio-economic side, the Government note with satisfaction the increasing interest evinced by fishermen in the education of their children. The Director of Fisheries is requested to append to future annual reports a statement showing the name and location of the fishermen schools, the strength of each class in the several schools, the number of students that passed out of each, the number of teachers employed with their qualifications and the cost of upkeep of each school during the year.

There is little progress to record under the co-operative movement on the west coast. There was a further fall in membership and share capital during the year. The condition of the societies in the Malabar District is slightly better, but the working of all the fishermen societies requires a thorough overhaul if they are to confer any benefit on the fishermen and the Government would be glad if the Registrar of Co-operative Societies would advise them on the steps that should be taken to improve these societies.

(By order of the Government, Ministry of Development)

A. McG. C. TAMPOE,  
*Secretary to Government.*

**Editors' Table.**



FRONTISPIECE ]

SIR F. A. NICHOLSON, K.C.I.E., I.C.S.,  
*Honorary Director of Fisheries (1907—1918),  
Founder of the Madras Fisheries Department.*

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FISHERIES DEPARTMENT.

*Received*

1928.

*Registered*

1928.

*Subject.*

Fisheries—Administration Report—1927-28.

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Ref. No. 1802-G./28.

STATION, MADRAS.

*Dated the 1st October 1928.*

From

DR. F. H. GRAVELY, D.Sc.,

DIRECTOR OF FISHERIES,

MADRAS,

TO

THE SECRETARY TO GOVERNMENT,

DEVELOPMENT DEPARTMENT.

SIR,

I have the honour to submit the annual report of the Fisheries Department for the year ending 30th June 1928. Towards the close of the year under report Government appointed a special committee to review all aspects of the work of the department and to advise upon them. The permanent Director, before he went on leave, prepared for the use of this Committee a "Note on the History, present condition, and future development of the Fisheries Department." In this he first discusses the activities of the department and subsequently the equipment and staff by means of which they are conducted. I have found it convenient to follow this arrangement rather than one adopted in preceding annual reports. The headings under which the activities of the department are discussed are also based on those used by Dr. Sundara Raj in the note referred to above, though for purposes of an annual report it has been found necessary to modify some of them slightly and to deal with them in a somewhat different order.

PART I.  
ACTIVITIES OF THE DEPARTMENT.

I. MARINE FOOD FISHES.

**A.—Sea Fishery Research.**

Sea fishery research is at present chiefly conducted on board the trawler "Lady Goschen" and in the laboratory at West Hill, Calicut. Another laboratory is being equipped for work on Krusadai Island and a little work is done (practically without a laboratory) at Vizagapatam. In all three of these shore stations, biological investigations have also been made in connexion with one or the other of the minor sea or backwater fisheries.

**I. TRAWLER.**—The steam trawler "Lady Goschen" commenced work in September 1927. The difficulties under which she started, both as regards equipment and crew, are dealt with below (pages 56-57). In spite of these difficulties she was able to accomplish a considerable amount of preliminary work before the monsoon set in.

Registers are being maintained containing particulars of each haul, including the depth and approximate position in which the net was shot, the times at which it was shot and hauled up, the nature of sea, sky, wind and current, the temperature of the air, and that of the sea water, the species of fish caught with their individual weights and notes on other organisms.

The chief kinds of fish caught on the Cape Comorin plateau are the following:—

*Big Fish.*

Tamil name.	Popular English name.	Scientific name.
1. Chepili ...	Red snapper ...	<i>Lutjanus doddecacanthus.</i>
2. Velameen ...	Sea bream ...	<i>Lethrinus nebulosus.</i>
3. Tholan ...	Perch ...	<i>Diagramma punctatum.</i>
4. Kalawa ...	Rock cod ...	<i>Serranus spp.</i>
5. Kuruvalli ...	Perch ...	<i>Lutjanus rivulatus.</i>
6. Thirukai ...	Rays and skates ...	<i>Trygon kuhlii</i> (mostly also <i>T. walga</i> and <i>T. sephen</i> ).
7. Surah ...	{ Dog-fish, sharks and saw-fishes,	{ <i>Carcharias spp.</i> <i>Pristis perrotteti.</i> <i>P. cuspidatus.</i>

Besides the above mentioned fish which on the average range between 1—3 feet in length, saw-fish and big rays even up to 10½ feet long have been caught; occasionally a small quantity of miscellaneous fish about 9 inches long were usually caught in each haul. The chief species represented were the following:—*Holocentrum rubrum*, *Myripristis murdjan*, *Scolopsis bimaculatus*, *Pagrus spinifer*, *Lutjanus spp.*, *Upeneoides vittatus* and *Upeneus spp.*

Other marine organisms commonly met with in the catches are:—Large quantities and many varieties of sponges, large quantities of huge sea-fans (Gorgonids) and black corals (*Antipatharia*), various sea-cauliflowers (*Spongodes spp.*), sea-cucumbers, star-fish, sea-urchins, feather-stars, brittle-stars, inedible fishes (e.g., globe-fish, scorpion-fish and trigger-fish, *Triacanthus* and *Monocanthus*), cuttle-fish and shell-fish such as rock oysters and *Avicula* attached to Gorgonids, etc.

Such of these organisms as were required for identification or for biological supply work were preserved.

Certain meteorological and hydrographical data were also recorded daily. Samples of sea water were also preserved to be analysed later in the Madras Aquarium Laboratory for the determination of chlorine contents, etc.

As a result of this work, the nature of the bottom has now been charted over an area of approximately 40,000 square miles with information as to the fish or other organisms to be obtained in different parts of it at the particular time of year at which the trawls were made on each of them; and the existence of a coral reef over which trawling is not only impossible but also dangerous to nets has been shown and its outlines mapped.

The collection of hydrographical and meteorological data has not yet progressed far enough for utilization. Other lines of biological research on food fishes, and the conditions on which their abundance depends await the provision of a laboratory on board.

2. WEST HILL LABORATORY, CALICUT.—The collection of data relating to the migrations of sardine and mackerel and their breeding habits continued, mostly on the same lines as hitherto employed. The periodical examination of specimens, a comparison of their diet as ascertained by microscopic examination of the stomach contents, with the predominating organisms of the plankton collections of the same period, and a daily recording of a physical aspect of the sea and the surrounding atmosphere were continued,



In April 1928, a more informative system of plankton analysis was devised involving the systematized handling of the plankton on a more carefully standardized basis. Work has begun on these lines from 7th May 1928.

There was a marked scarcity of sardines during the year, but mackerels were plentiful. From July to October 1927, when sardines were not available, periodical examinations were conducted on specimens of sardines and mackerels hand in hand with plankton analysis. Sardines were not also available for examination between the 18th October 1927 and 18th June 1928. During the season when monsoon weather prevailed the collection of plankton was suspended from the 30th May and 19th June 1928.

The monthly statements of catches, with value of the various varieties of fishes of economic importance received from the fish-curing yards of Malabar and South Kanara for the year 1925-26 were tabulated. A detailed analysis of similar records for the year 1926-27 has been commenced. But as the staff consists of only one Research Assistant, the work has necessarily suffered.

In the beginning of the year 1928, statistics of sardines and mackerel brought to fish-curing yards during the five years ending 1926 were received and graphs to illustrate monthly fluctuations in the occurrence of sardine and mackerel have now been plotted.

3. KRUSADAI ISLAND.—This laboratory is being established mainly for the study of problems connected with the pearl and chank fisheries. No work in connexion with food fishes has yet been commenced here.

4. VIZAGAPATAM.—The collection and identification of the common edible fish in the Circars, is being carried on wherever practicable. To this end, all the fish-curing yards are to be supplied with necessary receptacles and preservatives shortly, and the respective yard officers have been instructed already regarding them.

With a view to identifying the "Copepods" of Vizagapatam Harbour and its vicinity, as also those of the backwaters near Vizagapatam town, an attempt is being made to get a plankton collection at least once a week from the sea and similar collections from the backwaters as often as practicable.

After the advent of a dredger in Vizagapatam Harbour, the dredgings were brought in and examined on two or three occasions,

but as they contained very few organisms (foraminiferan shells) further examinations were suspended.

With a view to finding out the actual causes of the marked depletion of fish in the sea on this coast, the Port Officers of Gopalpur, Baruwa, Calingapatam, Vizagapatam and Cocanada have been addressed to furnish a copy of their log books which when received will be consolidated and correlated with the quantities of fish brought to the various yards for the last 10 or 15 years as furnished in section VI of the general information registers maintained in the yards. Copies of these registers have already been obtained and filed in the Vizagapatam office for the purpose.

Fish statistics are being collected regularly and tabulated. For want of time, these returns remain for the present simply as filed in the office.

## B.—Technological Research.

1. NETS AND METHODS OF FISHING.—Opportunity is being taken to avail of the expert knowledge and experience of Captain Cribb in making the long-desired reforms in fishing gear and methods of fishing in this Presidency. Though this has been one of the primary aims of the Department from its inception, no real attempt at improving existing fishing tackle and methods could be made in the past for want of an officer with expert technical knowledge.

Proposals to permit Captain Cribb to demonstrate to the fishermen of Tanur and Calicut new methods in the capture of sardine and mackerel and to suggest the improvements to the indigenous nets used have been submitted to Government.

2. TANUR EXPERIMENTAL STATION—*Labour*.—Special attention was directed to the reduction and standardization of working costs by organizing labour. The coolies engaged on daily wages were dispensed with and contract rates for piece-work were introduced. This has resulted in a certain amount of saving. The production was one and a half times that of last year in cured products and two and half times in fish-meal. Yet the working costs are less by Rs. 100.

*Plant*.—Studies on the remodelling of the manufacturing plant, to reduce coolly labour, fuel, etc., were made and a small engine for powdering fish-meal, etc., was purchased. Improved types of cooking vats and gutting tables are being considered and tried.

*Sodium hypochlorite.*—Experiments with electrolysed sea water to preserve fish for sale as fresh fish could not be completed on account of the disconnexion of the electrolysing plant at the Aquarium necessitated by alterations to the building now in progress. The results so far obtained seem to indicate that it is more a bleaching and deodorizing agent than a preservative. Applied in weak solutions it had no appreciable effects; and as strong solutions it bleached the blood and disintegrated the flesh; but mixed with saturated brine it quickened the penetration of salt. Its properties as a sterilizing agent will be further tried in the current year.

*Utilization of sharks.*—Two experiments with shark skins were conducted in 1921 and 1925 at the request of the Leather Trades Institute, but the methods were primitive and wasteful. Instructions as to the proper methods of skinning and curing have since been received from the Ocean Leather Company, America, where the industry is carried on extensively. Forty-one sharks costing Rs. 249-14-0 were purchased in the season and skins varying in length from 3 to 5 feet were obtained; the labour charges came to Rs. 66-8-0. The liver gave ten gallons of oil. The fins were dried unsalted; the flesh was converted into fish-meal; the bones to bone-meal and the teeth salted, preserved and dried as they are found to have a special market value. Twenty-one skins were sold and the sale of the rest is under correspondence.

*The reduction of fat in fish-meal.*—This is necessary to prevent rancidity and to increase keeping power. To test the effect of more efficient pressing two experiments were conducted in hydraulic pressing this year. The results show that by cooking and pressing the fresh fish the reduction of fat content, though appreciable, is not sufficiently low to justify the high investment it involved. In the case of fish which is not perfectly fresh the fat can be reduced even to 1 per cent of the dry weight of the cake but this is effected by pressing out the major portion of the solid fleshy matter as "foots". This reduces the dry weight of the cake to 4·3 per cent of the wet weight as against 16 to 20 per cent in the ordinary process. The chances of selling fish-meal at high prices being limited, the economic advantage of the reduction of fat by this method seems doubtful. Two new fish-meals introduced in the year were prawn shell-meal and shark-meal. Both have found favour with customers, the former for its cheapness (one anna per pound), and the latter for its low fat content (5·24 per cent) and white colour.

*Fish-curing.*—Experiments were also made to determine the proper proportion of salt for shelled prawns and mullan (*Equula*) in wet and dry weather and for mackerel under Ratnagiri cure on the first, second and third day. The following proportions have been fixed for the present:—

		Wet weather.	Dry weather.
Shell Prawn	...	1 : 4	1 : 5
Mullan	...	1 : 6	1 : 8
Mackerels under			
Ratnagiri cure	...	1 : 6	1 : 12
			1 : 19 on the first, second and third days.

*Sod oil or "depas".*—Experiments with fish oil, stearine and tallow were conducted; samples of sod oil were approved by the Leather Trades Institute and eight gallons were supplied to them.

*Analysis.*—The usual analyses of oil, guano and fish-meal were conducted at the laboratory.

3. CHALIYAM CANNERY.—As manufacture was suspended, no experiments could be made.

4. MADRAS.—Apparatus was sent up for determining the salinity and chlorine content in the samples of sea water collected by the trawler. Seventeen samples of water were analysed and the results tabulated. Further experiments on the preservative qualities of sodium hypochlorite solution could not be pursued as the electrolyser had to be disconnected when the southern wall of the laboratory was dismantled for the extension of the turtle tanks.

### C.—Sea Fishing Licences.

Under section 6 of the Indian Fisheries Act, licences for fishing with fixed engines were issued for 61 bushes and trees in Palk Bay.

### D.—Fish-curing Yards.

1. EAST COAST (NORTH)—*Improvements.*—Formerly a small fee used to be collected from the ticket-holders for lighting purposes. This has now been stopped, and each yard is being supplied with a tin of kerosene oil, and a hurricane lantern.

It has been noticed, especially in many of the northern yards, that the yard staff use for drinking purposes water from sub-soil ponds, dug out within the yard's precincts. The water from these pits is so foul, that many of the yard staff suffer from some ailment or other. The Inspector has therefore asked for the introduction of some sort of cheap sub-soil well protected by glazed earthenware

rings, as at Malpe and other places on the West Coast. It is hoped that such wells will be tried in the yards in the Circars during the coming year.

Similarly salt measuring trays which are in vogue on the west coast, will, it is hoped, be introduced on the east coast also. Some have already been made and sent to the yards. The introduction of these trays will do away with actual weighing of salt for issue.

The substitution of glazed earthen pots for curing fish in place of the highly insanitary mud pots, barrels, etc., now in use has not yet been given effect to owing to the difficulty of getting them. Further efforts are being made in this connexion.

*Yards opened or closed during the year.*—The number of yards in this section of the coast continues to be the same as last year. Proposals to open new yards south of Uppada in the Gōdāvāri and Kistna districts have not as yet materialized as time has been insufficient for the search for suitable places.

Though Government have sanctioned the opening of a fish-curing yard at Srirangapuram on 29th March 1927 it has not as yet been established, for want of a suitable cheap site. The land originally selected had to be given up on account of its prohibitive valuation (Rs. 44,333). Subsequently another plot of ground situated close to the fishermen's colony, recently inspected and approved by the Director, met with the same fate. The retention of the Mulapeta fish-curing yard in the East Gōdāvāri District, for a further period of one year from 1st April 1928, was sanctioned.

*Curing operations.*—57,532 maunds 19 seers of fish were brought to the yards during the year and 7,000 maunds 30 seers of salt valued at Rs. 8,750-15-0 were issued for curing. The dry weight of fish removed from the yards was 32,970 maunds and 35 seers. Thus the transactions are only about half of those of last year.

There has been a general decrease in all yards except those at Pattisonapur, Iskapalem and Battigalluru; even in these yards there is no great increase. The yards that were most adversely affected during the year were Manchinillapeta and Pundi in the Ganjām District, Bimlipatam, Kotturu, Montgomeripeta, Gangavaram and Raziapeta in the Vizagapatam District, and Konapapeta, Uppada and Mulapeta in the East Gōdāvāri District.

This marked decline in operations is more directly due to natural phenomena, such as the prevalence of rough seas during

the greater part of the year, than to migration of families to work as coolies in Rangoon, the Malay States, etc. The latter is only a result of the former and cannot be regarded as a primary cause for the decrease in the operations.

Other reasons, which have contributed greatly to the heavy fall in operation in these yards during the year, are:—

(i) Poorer catches of shoaling fish such as sardines and cat-fish, during the year. This may perhaps be a result of the unfavourable weather conditions.

(ii) The curers prefer to have the fish privately cured outside the yard, and this private curing is still being resorted to on a very large scale all along the coast. Though a remedy for this lies in the hands of the Municipality, Union and Taluk Boards, they have not as yet openly penalized such operations in the Circars, except at Calingapatam, where curers are now made in the interests of public health to resort to the Government yard, in more numbers than before through the active co-operation of the Union Chairman.

(iii) Yet another cause for this poor attendance at the fish-curing yard has been brought to light. Some of the curers, it is reported, have illicitly been removing salt-earth from areas where this is available and were caught using it for curing fish. The Salt department seems, however, to have taken measures to put a stop to this by appointing preventive officers and also by directing the fish-curing yard staff to patrol all areas from which the salt earth is removed for curing purposes.

(iv) Some of the yards which were supplied with salt by the Summadi salt factory had to go without it for four or five days during the heavy catches.

*Supply of salt.*—As most of the northern yards are situated in out-of-the-way places, considerable difficulty and delay is experienced in transporting salt from the salt factories. The cartmen refuse to transport salt at low rates, especially during the wet weather. There have been instances where certain yards had to go without salt for a day or two on account of such trouble, even in spite of previous contracts and agreements.

Excepting the four yards at Mulkam, Bimlipatam, Kotturu and Montgomeripeta, respectively, which are supplied with salt by the Excise Department, all yards are being supplied with monopoly salt reserved in the factories. Gangavaram, Jalaripeta and Lawson's Bay in their turn, get salt from the ditto stock of the

modified excise factory at Balacheruvu. The quantity of monopoly salt purchased during the year under review is only a little more than half the quantity purchased during the previous year, whereas the quantity of excise salt purchased exceeded that of last year by about 150 maunds. The rate per maund of monopoly salt varied from Re. 0-3-6 to Re. 0-5-0 in the northern yards and from Re. 0-2-6 to Re. 0-6-0 in the southern yards. The rate per maund of excise salt varied from Re. 0-5-3 to Re. 0-7-0. The ditto stock of the modified excise factory at Balacheruvu varied from Re. 0-4-0 to Re. 0-8-0 per maund.

The balance of salt on 30th June 1928 in the yards was 1,687 maunds 22 seers against 1,454 maunds 26 seers last year.

*Licensing fees on the fish-curing yards.*—As per orders of Government received on 15th July 1927, the President, Union Board of Calingapatam, levied licence fees on the yard. At first he proposed to levy Rs. 5 but on representation reduced it to Rs. 3.

2. EAST COAST (CENTRAL)—*General.*—This area comprises the ten yards in the Nellore and Chingleput districts. The outstanding feature of the year was the cyclone which swept over the Nellore District, causing considerable damage to the three yards near Krishnapatam and slight damage to the yards in Pulicat circle. The Nelatur yard was completely swept out of existence by a tidal wave, while in the case of the Kondurpalayam and Kottapatnam yards, both the salt sheds and the curers' sheds collapsed.

*Yards opened or closed during the year.*—Operations in all yards being reasonably good, no yard was abolished during the year. The temporary yard at Nelatur was made permanent under G.O. Mis. No. 622, Development, dated 31st March 1928, in view of satisfactory operations during previous years, and the deposit amount of Rs. 150 was returned to the fishermen.

*Curing operations.*—The transactions, though generally good, were not so good as in the previous years. The total quantity of fresh fish brought to the yards was 53,924 maunds 5 seers against 71,069 maunds 39 seers in the previous year.

In the Nelatur yard, there was a heavy fall from 6,305 maunds 26 seers fresh fish in 1926-27 to 3,394 maunds 24 seers in 1927-28. This extraordinary reduction was due to the cyclone which not only swept away the yard, but also destroyed the nets and boats of the fishermen thus disabling them for several months from doing fishing work. Further, the yard had to be closed temporarily for nearly a month on account of the destruction of the sheds. Even now the men have not fully recovered from their losses and

are in need of nets. The next greatest fall was in the case of Pulicat yard. In 1926-27 this yard received 4,579 maunds 32 seers of fresh fish, while in the year under report it received only 2,954 maunds 32 seers or 1,625 maunds less. The Sattankuppam and Pulicat yards always work at a loss owing to extensive private curing done in the locality and the existence of a brisk fresh fish trade with Madras. So long as there is this private curing there appears to be no chance of improving the curing operations in the yards.

There was a satisfactory increase in the transactions of the Kadapakkam yard. In 1926-27 only 1,016 maunds 38 seers of fresh fish was brought to the yard, while in 1927-28, 2,248 maunds 28 seers was brought in. The closure of this yard was seriously considered sometime ago on account of its very poor transactions; but now that it has shown improvement, there appears to be no necessity for this. The general decrease in the operations appears to be due to paucity of fish caused by general failure of rains for the past few years; this is the explanation given by the fisherfolk.

*Supply and transport of salt.*—As no monopoly salt could be had in any of the salt factories near the fish-curing yards, salt was purchased from excise licensees and supplied to the Kadapakkam yard and to the three yards near Krishnapatam, viz., Nelatur, Kottapatnam and Kondurpalayam. The six yards in and around Pulicat got their salt supply from the Madras Salt Depot. If monopoly salt could be had from salt factories, the expenditure could be greatly minimized; but it is not available.

As regards transport, salt is sent to the three yards near Krishnapatam in Government boat. In the case of Pulicat yards, it has been the practice to take salt to the yards in hired boats, but the system worked very badly, causing at times considerable delay in the transport and starving some of the yards at times. During the year this was put an end to and the work was entrusted to a contractor who entered into a contract with us to convey salt to the yards at a fixed rate based on the average of the past three years' expenditure. This system is working smoothly and effectively and the yards are getting salt promptly and in time. Salt is however still taken to the Kadapakkam yard in hired boats.

*Wastage of salt.*—Excepting at Nelatur, there was no wastage of salt in any of the yards. The quantity lost at Nelatur as a result of the cyclone was 20 maunds 5 seers; a cash balance of Rs. 29-11-0 was also lost. Both were written off under G.O. Mis. No. 118, Development, dated 23rd January 1928.



3. EAST COAST (SOUTH)—*Transactions*.—A total quantity of 80,785 maunds 33 seers of fish was brought into the 14 fish-curing yards in the three districts against 78,476 maunds 21 seers last year as detailed below:—

Tinnevelly, 4 yards	...	35,708	maunds	23	seers.
Rāmnād, 3 "	...	22,162	"	19	"
Tanjore, 7 "	...	22,914	"	31	"

A total quantity of 15,616 maunds 18 seers of salt valued at Rs. 19,520-9-0 was issued to the curers against 14,851 maunds 9 seers of salt valued at Rs. 18,564-12-6 in the previous year. The weight of cured fish removed from the yard was 56,333 maunds 38 seers as against 55,218 maunds 4 seers in the last year.

The transactions in almost all the yards were good though not as good as they might have been since the usual shoals of fish did not appear in certain centres.

4. WEST COAST—*General*.—There were 57 fish-curing yards working on this coast during the year. Of these, three were private yards opened only during the fishing season of the year. Of the public fish-curing yards, one worked only during the fishing season.

Two yards, one at Kirimanjeshwar and one at Vekkode were opened for the first time during the year. Government have already sanctioned the opening of new yards at Puthiakadapuram near Tanur and at Natikka. Memorials have been received for the establishment of yards at Edakad and at Baikampady. As reported last year, Government have sanctioned the opening of a fish-curing yard on the Agathi Island in the Laccadive group. It was intended to start the yard when the inspection party went there. But as there was no inspection this year, the yard could not be started.

*Transactions*.—Appendix No. II (9) gives the transactions in the yards during the year. The number of applications for salt rose from 117,060 last year to 145,138. The weight of fish brought in was 1,507,736 maunds, and the weight of salt issued 244,081 maunds 1 seer, realizing Rs. 3,05,101-4-6 and the quantity of cured fish removed from the yard was 887,039 maunds 36 seers. The corresponding figures for the year ending 30th June 1927 were 890,868 maunds 1 seer of fresh fish brought to the yards, 146,160 maunds 24 seers of salt, realizing Rs. 1,82,700-12-0 and 542,227 maunds 9 seers of cured fish removed from the yards.

The season commenced rather early and was very promising at the beginning. The catches, especially of mackerel, were so heavy that the stocks of salt in many of the yards were exhausted within about a fortnight of the commencement of heavy operations.

The price of cured fish went so low that it was found more profitable to convert mackerel into manure. It is reported that even salted mackerel were in some cases sold as manure, there being little difference in the price between the beach-dried mackerel manure and the salted mackerel. When the stock of salt was depleted in certain yards, some of the curers are reported to have used bazaar salt and it has been calculated that had there been no depletion of the stock of salt in the yards, over 23,000 maunds of salt more would have been consumed. The depletion, however, was not felt as much of a hardship, as the curers did not gain by the sale of the fish.

Although the year under review has been an unusually prosperous fishing year, neither the curers nor the fishermen derived the benefit they should have from the heavy catches. So continuous and extensive were the catches that prices both of fresh fish and cured fish slumped heavily and the fishermen barely got a living. Some of the curers were actually reported to have sustained heavy losses. At times the selling price of fish in Colombo, the principal foreign market for Indian salt fish, was actually less than the cost of producing it here and transporting it there.

The Colombo system of curing was introduced during the year in the Gangoli, Hangarkatta and Ullal yards. This method of curing is becoming increasingly popular among the South Kanara curers.

Brine curing has not been resorted to in any of the yards except in Malpe II where 1,170 gallons of filtered brine are reported to have been used.

Uppala, Mattool, Badagara and Ponnani are the only yards which show a fall in operations. Mattool appears to be badly located. In Badagara bazaar salt is sold very cheap and the big salt merchants who have their godowns allow salt on credit. Consequently there has been a great deal of private curing outside the yard, since the issue price of salt was raised. Ponnani yard has steadily been declining. It is located at the southernmost corner of the fishing village far away from the usual resort of fishermen and curers. The coolie charges incurred in taking raw fish to the yard and removing the dried products, added to the issue price of salt since it was raised, are found to exceed the charges incurred in curing the fish near the fish market with bazaar salt. For this reason, all the curers have separate private fish-curing sheds licensed by the Union Board. The curers who do not resort to the yard are not subject to any rules and restrictions in the matter of curing. It is under contemplation to shift the yard a little to the north so as to afford the fishermen better facilities for curing.

In the Uppala fish-curing yard there was a fall in the consumption of salt, only 116 maunds 20 seers having been consumed against 123 maunds 30 seers during the previous year. As the transactions of this yard are disappointing its closure is under consideration.

The Tellicherry, Quilandi and Parappanangadi yards are in danger of being washed away by the sea. In the case of the yard mentioned last, erosion by the sea as well as by flood water from inland has been so destructive that its shifting has become compulsory. The proposal has been sanctioned by Government and a new site is being acquired. The cost of shifting the yard will be borne by the ticket-holders.

*Curing sheds.*—The ticket-holders are beginning to appreciate the advantage of permanent masonry sheds and cemented salting tanks. Persuading them to put up masonry shed is becoming easier. Over 20 have been built during the year. In one yard, lack of funds alone stands in the way of wholesale conversion of the temporary thatched sheds into masonry ones.

*Demonstration curing.*—The demonstration curing shed constructed at Government expense at the Malpe fish-curing yard conducted five operations between 23rd October 1927 and 16th December 1927. The fish cured for demonstration purposes were appreciated by the curers and were sold at prices higher than the current market rates. A net profit of Rs. 49-2-2 was realized though the quantity of fish cured was only 131 maunds 34 seers. The number of operations could not be increased for want of funds. In the demonstration shed at Calicut, 29 maunds 10 seers of fresh fish was cured and sold to fish merchants. The transactions yielded no profit as the fish treated was mackerel.

*Taxation by Local Bodies.*—The arbitrary levy by local Boards of exorbitant licence fees from the curers has been pressing heavily upon them, but in consequence of the representations made by the officers of this Department the Government have fixed a reasonable maximum fee for such licences. The curers are to be exempted from the payment of licence fees in respect of sheds in a fish-curing yard, but in respect of each fish-curing yard the Government are liable to pay a licence fee not exceeding Rs. 5. In regard to store sheds outside the yard, the Government have fixed a maximum fee of Re. 1 per year. The notification was issued on 2nd October 1927. As, however, the licence fee was technically due on 1st October 1927, some Local Boards have given effect to the notification only with effect from 1st April 1928.

*Transport of salt from Tuticorin to West Coast.*—During the season the trawler was able to do only 5 trips for transport work.

As in the previous year, the following schooners were chartered for transport work during the season from the Masula contractor:—

	Capacity.	Rate of hire
	BAGS.	per month.
		RS.
"Nageswaraswamy" ... ..	5,600	1,250
"Seetharamaswamy" ... ..	4,400	1,000
"Swami" ... ..	2,500	750
"Anjeneyalu" ... ..	2,400	700

Unfortunately the biggest schooner "Nageswaraswamy" sprang a leak shortly after her arrival and the salt bags loaded in her had to be unloaded to enable her to go over for repairs, and her services were not available for the rest of the season. This shortage in the number of schooners chartered, their late arrival at Tuticorin and the sudden demand for large quantities of salt consequent on the unexpectedly large catches of mackerel rendered transport by rail as well as by a private contractor in his schooners necessary off and on. A statement containing the total quantity of salt transported under these heads is given in Appendix III.

For the 5 trips with salt schooners undertaken the expenses were roughly as below:—

Total quantity of salt transported by trawler ...	Maunds.		
	62,254		
Cost of transport by the trawler ... ..	RS.	A.	P.
	22,113	2	2
Average cost per maund ... ..	0	5	8½
Average cost if a contractor had been engaged...	0	6	5½
Profit per maund by transport of salt by the trawler ... ..	0	0	9
Profit by transport of 62,254 maunds of salt by trawler ... ..	2,918	2	6
Total quantity of salt transported during 1927-28	Maunds.		
	231,080		
Total profit that would have been derived had the whole quantity been transported by trawler.	RS.	A.	P.
	8,920	9	6

This bears out the conclusion arrived at in paragraph 153 of the last year's annual report that transport of salt by trawler is cheaper than by the private hired schooners.

*Wastage of salt.*—The total quantity of wastage ascertained and written off during the year was 1,359 maunds 25 seers against 1,162 maunds ½ seer in the last year. The increase in the wastage during the year is due to some bags having been jettisoned from schooner "Bridget Ammal" and some bags having been damaged during adverse weather, while under transport.

### E.—Private Oil and Guano Factories.

There were 470 oil and guano factories licensed during the year against 504 last year. But on account of the failure of the sardine fishery as in the previous year, only a few (156) of them did any actual work. Sardines were scarcer even than during the previous year which was itself one of the poorest sardine years on record. Approximately 200 tons of fish oil, valued at Rs. 50,000, 850 tons of fish guano, valued at Rs. 95,000 and 1,00,000 tons of fish manure valued at Rs. 10,00,000 were produced. The corresponding output for the previous year was 640 tons of fish oil, 2,100 tons of fish manure. Owing to the abundance of mackerel, attempts were made to extract oil and guano from this fish. The oil yield was very poor, but the guano and manure manufactured from mackerel were found to have high manurial value, equal to, if not actually higher than, sardine guano. The price of guano rose from Rs. 80 to Rs. 200 and of oil from Rs. 175 to Rs. 350 per ton, loose ex-factory. Mackerel manure was sold for Rs. 60 to Rs. 120 and sardine manure for Rs. 80 to Rs. 150 per ton. No systematic inspection of oil and guano factories was made owing partly to lack of time and partly to the very small number of factories that worked and the limited extent of the operations carried on even in them.

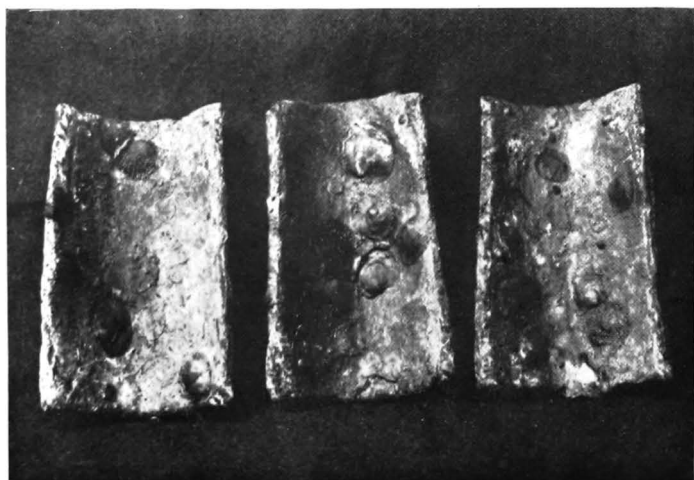
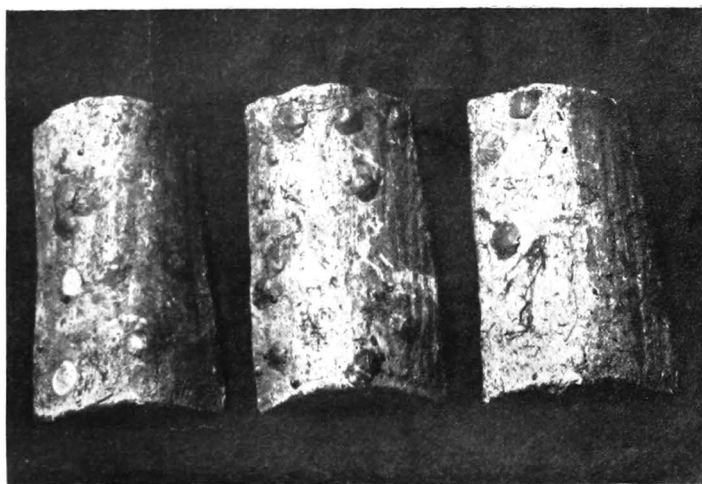
## 2. MINOR MARINE AND ESTUARINE FOOD FISHERIES.

### A.—Prawns.

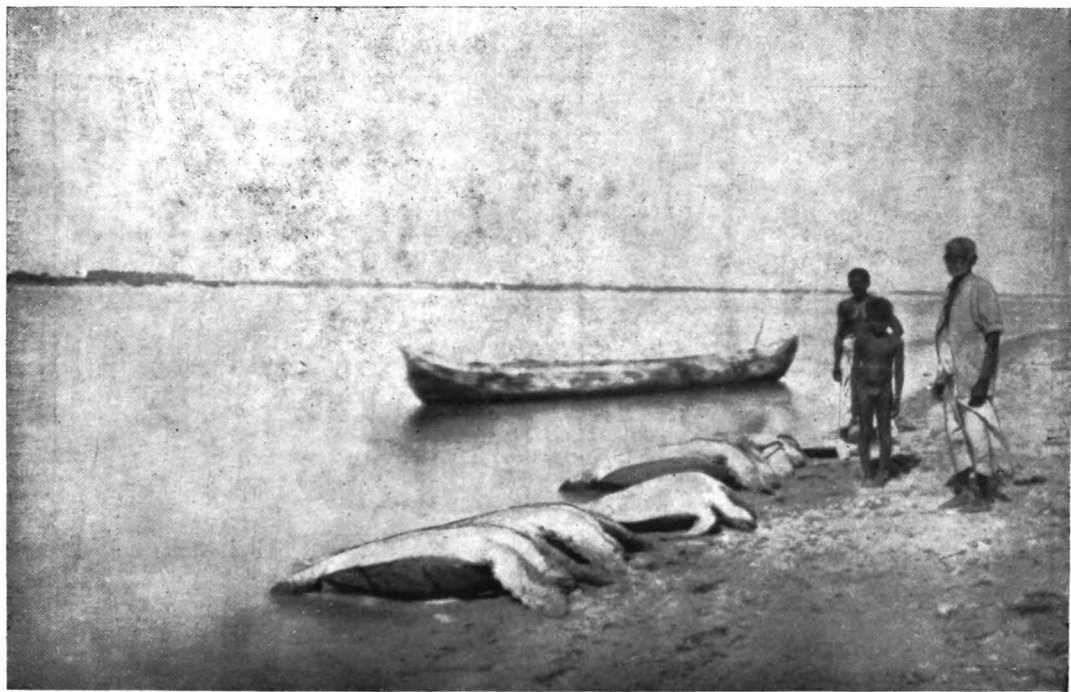
The Research Assistant, West Hill, Calicut, has investigated the methods employed in the farming of prawns at and around Dharmadam. Prawns are gradually collected from the rivers in the neighbouring paddy flats, by system of controlled sluice gates and periodical hauls at the option of the operator. During the course of the investigation samples were collected from periodical hauls. Photographs were taken of the fields and appliances, and plans of their structures sketched. A consolidated report on this fishery is nearing completion.

### B.—Edible Oysters.

ENNUR.—The 1927 supply season lasted till 4th November 1927; and the 1928 one was started on 23rd February 1928. It had to be closed on the 18th April owing to the scarcity of marketable oysters in the Ennur beds which alone could be worked. The sale of 147,550 oysters from 1st July to 4th November 1927 (84,100 oysters) and from 23rd February to 18th April 1928 (63,450 oysters) together realized Rs. 2,155-1-0.



Oysterlings attached to tiles used in oyster culture, Pulicat Oyster Farm.



Krusadai Island Turtles.

Arrangements were made with the Executive Engineer, Chingleput Division, to exclude the Ennur oyster beds from the shell collection lease for the current year.

**PULICAT.**—The rest needed by the Pulicat beds was continued during the present year.

**SEARCH FOR NEW BEDS.**—When the Ennur backwater beds were found unable to meet demands, attempts were made to go further afield and exploit the reported extensive beds of Iskapalli and Gokulapalli near Talamanchi (Nellore District). As it was found that these beds were leased to shell contractors, the concerned Executive Engineers have been asked to exclude the areas from the next lease. As the locality is a new one to the department, necessary organization for the regular work of collection, further treatment, and conveyance to Talamanchi railway station does not exist. If the Pulicat beds are not found able to supply the oysters required next year, means for exploiting these additional beds must be considered.

**OYSTER GRIT FOR POULTRY.**—The demand for this continues. A sum of Rs. 84-4-0 was brought from the sale of 1,610 lb. of the grit; one of the orders received was from Perak in the Federated Malay States.

#### **C.—Beche-de-mer.**

3,063 lb. beche-de-mer were cured at the Government curing station at Tirupalagudi against 1,474 lb. in 1926-27, and 1,187 lb. in 1925-26. Plenty of raw material is reported as available all along the coast, and I understand that a local merchant proposes to start a private curing yard at Tirupalagudi on the same lines as the Government yard. Since Government have decided not to renew the lease of the Rāmnād chank fishery and since the curing of beche-de-mer was carried on simply to supplement the earnings of Rāmnād divers, no more beche-de-mer curing will be conducted from 1st July 1928. As a result of the Government enterprise at Tirupalagudi, there will now be a private yard working and it is hoped that, with the abundance of raw material reported to exist, the industry will develop satisfactorily.

#### **D.—Turtles.**

The shallow seas around Krusadai Island are favourite feeding grounds of the two edible turtles and the one yielding the tortoise-shell of commerce.

The egg-laying grounds of these turtles range from Dhanushkodi to Pamban and the adjacent islands. A supply of turtles to the



Madras Club, one per week as required by that club was started in the middle of March 1928; the supply could not be maintained steadily as unfavourable weather conditions off and on prevented turtle fishing.

### 3. INLAND FOOD FISHES.

#### A.—Inland Fishery Experiments and Research.

1. DEEP WATER TANK FISHING EXPERIMENTS.—The results of the deep water fishing experiments conducted in the Mopad Reservoir are highly satisfactory. Notwithstanding the low level of the lake during the first part of the year under review, the daily catch has been uniformly good, which was not the case before. The changes introduced into the methods of fishing and the introduction of new nets to suit deeper water are producing the desired effect. The old method of cast net fishing has been practically abandoned. The first new net introduced was the Ennore net, referred to in the report of 1925-26. Though it was not successful at the beginning, partly owing to its newness and the consequent apathy of the Mopad fishermen towards it, and partly to their ignorance of the method of plying it successfully, the men have now acquired, as a result of the experience gained in the subsequent years, the deftness of hand and the quickness of action necessary for it and they are now able to bring up good hauls even in deep water. Subsequent to this, several drift nets, with varying meshes were introduced one after the other with good results. These nets are used both by day and by night. During nights the net is allowed to drift in the lake and the next morning it is hauled up and the enmeshed fish are gathered; but during the day, it is spread out in a spot favourable for fishing and the fish are driven into it by splashing the water and other contrivances; in this way also good catches are secured. Realizing the efficiency of this net for deep water fishing, it is now reported that the local fishermen have made similar nets and are using them to poach fish in the lake at night. Though the men may be utilizing the knowledge acquired from us in a way detrimental to our own interests, it is nevertheless a matter for gratification that our demonstrations have had such definite success. In addition to the above nets, it is under contemplation to try some of the sea nets, notably the inshore seine called "Periyavalai", especially when the tank is full. Owing to financial considerations this could not be done during the year but will be tried later when funds permit.

From September last, a register has been maintained recording the results of daily operations and an extract from it is given

below to give an idea of the catching capacity of the various nets. The small catches by drift nets in January 1928 are due to the fact that the nets in use became worn out and there was delay in securing new ones—

Year and month.					Name of nets.		
					Ennore net.	Drift net.	Cast net.
					LB.	LB.	LB.
1927	{	September	...	...	275	1,073	...
		October	...	...	...	1,416	...
		November	...	...	...	830	...
		December	...	...	...	1,143	...
1928	{	January	...	...	...	162	168
		February	...	...	420	207	...
		March	...	...	635	...	...

In previous years it was the practice to bring the daily catches to shore in a dead condition. In a country like that around Mopad, where the temperature goes up to 112 degrees and even more at times during the hot weather, the tainting and putrefaction of fish is greatly accelerated and for this reason, it is necessary to dispose of the catches as quickly as possible. In that sparsely-populated place too with no markets near by, great difficulty used to be experienced in selling the catch while fresh and consequently considerable quantities of fish used to be cured, which resulted in appreciable loss to Government. This difficulty, however, was completely overcome during the year. Fish are now brought to the shore alive with the aid of a "Livecar" and are stocked in one of the farm ponds until there is demand for them. By this means, it has become possible to supply fresh fish regularly every day to the fish contractors both at Kanigiri and Udayagiri in absolutely good condition, and also to some of the private purchasers who indent for such fish now and then. This system is greatly appreciated by all and for the first time, the public of the Mopad and Udayagiri taluks are able to secure fresh fish, free from taint and putrefaction.

During the year 10,998 lb. of fish were caught in the Mopad Reservoir and sold for Rs. 1,029-0-4.

2. FISH BREEDING—*Hilsa*.—*Hilsa* hatching experiments at Bezwada were again attempted this year during the *Hilsa* season and with better results than last year.

*Gourami*.—These are thriving in all the farms, including the Vellore Fort Moat into which they were introduced last year and

the Praema and Mopad farms where the fish were introduced only a few months ago.

At Vellore Fort Moat they bred successfully last year. During the inspections of the farm nearly a dozen nests were observed in the gourami sections. The heavy growth of water-lilies whose leaves are eaten by this fish provides good feeding. In a year or two it will be possible to supply this valuable fish to the local market, where there is always a keen demand for fish. At Mopad only about 30 young fish were put into one pond, more or less as an experiment and large head of medium-sized fish will be transferred shortly as soon as the ponds which are now being repaired are ready. At Praema, bigger fish of 6" to 9" which were introduced into two ponds in December and March last, have begun to breed, although the same sized fish at Sunkesula have not done so. This shows that climatic and other conditions at Praema are more suitable than at Sunkesula for this fish.

A large number of breeders kept in one of the breeding ponds at Sunkesula has not bred satisfactorily for the past few years. The breeding pond in question was much more shady than the other gourami ponds, both at Sunkesula and elsewhere. A large number of overhanging branches was therefore lopped off to give more light to the pond; after this it was completely netted and cleared of all fish. In this 25 pairs of select breeders were placed in January last. After six months in June last several young ones from 1½" to 2" in length were found in this pond. The experiment thus shows that excessive shade was the cause of the gourami not breeding in this pond before.

In July 1925 half a dozen gourami were supplied free on an advertisement to Mr. E. N. House of Puthuthottam Estate, Anamalais, for breeding purposes. He subsequently reported that the fish were thriving well in his tank at an elevation of 3,500 ft. Having seen the suitability of the fish for small pond culture, he has recently constructed some small ponds and sent in an indent for 10 dozen gourami fingerlings. These will shortly be supplied. Another gentleman in Madras, Mr. S. V. Ramaswami Mudaliyar, recently purchased a dozen gourami fingerlings for breeding purposes. This valuable food fish is thus beginning to attract the attention of the public and with some propaganda, there should be great demand for it from big land-holders and others.

*Mullets.*—Mullet fry is used largely for stocking some of the provincialized tanks in the Nellore and Chingleput districts. To find out their rate of growth a small experiment was conducted

in the Chingleput Fort Moat. Towards the end of January last 2,000 mullet-fry 2" to 3" long caught in the Adyar backwater were placed in a section of the Chingleput Moat. When in April on account of the failure of rain the water in the moat went very low and the fish had to be caught, the mullets were not only found living having acclimatized themselves to fresh water but were found to have grown to a length of nearly 7". Under more favourable conditions the fish should show still better growth. This experiment will be repeated and an attempt made to find out the maximum growth of the fish under fresh water conditions.

*Catla*.—The Mopad Reservoir was stocked with catla fry from the Gōdāvāri as follows :—

1921	...	...	1,000 fingerlings	4" to 6"
1922	...	...	600 "	"
1924	...	...	200 "	"

Though two or three big catla were caught in previous years young ones were never found. In February last the Inspector of Fisheries (Inland), while supervising the netting operations, came across 4 fingerlings, each 4" long. Since then about 50 fingerlings have been caught and released. This goes to prove the utility of stocking big reservoirs with suitable fish which will ultimately enhance the value of their fisheries.

*Etroplus*.—As a result of our stocking Willingdon Reservoir with fry of etroplus this fish has now established itself in that water area. This has been testified to both by the fishery contractor and the Public Works Department.

*Tench and English carp*.—Owing to the cramped space available at Sunkesula both are accommodated in a single pond, and they have to some extent deteriorated. They will shortly be transferred to the Praema ponds, where conditions are more favourable for their growth and breeding. Next January a further consignment will be brought from Ootacamund to supplement the present stock.

## B.—Stocking, Protecting and Leasing of Tank and River fisheries.

STOCKING OPERATIONS.—Though the north-east monsoon commenced in good time and was favourable at the outset for piscicultural operations, owing to its sudden break during the latter half of November and the cessation of rains thereafter, a large number of provincialized tanks in the Presidency, particularly in the Nellore and Chingleput districts, received only partial supplies, while an appreciable number received practically no supply at all. Several tanks could not be stocked for want of sufficient water.

During the year under report there was a paucity of catla fingerlings in the Gōdāvāri and so it was possible to transport only 2,396 young ones against 3,300 in the previous year. They were distributed as follows :—

The Cauvery River	...	...	...	...	1,143
Ippur Fish Farm	...	...	...	...	853
Attigunta Tank, Nellore	...	...	...	...	400

It was not possible to deal with other waters on account both of drought at the time of stocking and of paucity of fish. The cost amounted to Rs. 340-6-10. Most of the catla left in the Ippur Fish Farm escaped during the cyclone. The remainder as well as those in the Attigunta tank, have not yet been disposed of. In all probability they will be fished departmentally and sold as the auction did not prove satisfactory.

The catla stocking experiment at the Vellore Fort Moat Fish Farm, referred to in the last year's report (page 37), proved a great success. Catla grew splendidly and also etroplus, which were introduced a few years earlier. In March 1928 the right of catching fish for one year was auctioned. There was very keen competition owing to the presence of catla and etroplus and the highest bid went up to Rs. 1,730. As stated in the last year's report the initial cost of stocking was only Rs. 85 and the high price obtained clearly shows the value of stocking impounded permanent waters with growing marketable fish.

2. FISHERY LEGISLATION.—The question of amending the Indian Fisheries Act is still pending with Government. As the matter now stands we have to fight with strong local combinations without any legal weapon. We are at present practically impotent to give any help to lessees against poachers. It is on account of this that outsiders are afraid to take up fisheries, when they find the local people are against them. Even when departmental fishing of any tank is undertaken, Fisheries officers have to conduct the operations with the aid of the police. In view of the delay in passing the legislation Government were moved to prohibit fishery in provincialized waters under section 6 of the Fishery Act for a period of two years as a temporary measure as was done previously.

3. FISHERY SALE CONDITIONS.—Hitherto there has been no uniformity in the matter of fishery sale notifications and agreements. This was unsatisfactory and in one or two instances the lessee took advantage of the defective conditions and successfully evaded payment. This unsatisfactory state of affairs has now been remedied, for, in G.O. No. 1240, Development, dated 13th August 1927, revised terms of sale and agreement giving no

loophole for bidders to back out when they liked, were issued for use by the auctioning authorities in all the districts. The revised conditions of payment of rentals were found, however, to be very stringent, as a result of which the first sale of the Gobichettipalaiyam Taluk fishery proved abortive and the men refused to bid until the conditions were modified. On representing the matter to Government, the conditions were modified in G.O. No. 531, Development, dated 23rd March 1928.

It may not be out of place to say something about the operation of these conditions with reference to fishermen co-operative societies to which some of the fishery leases are given. It is an admitted fact that the members of the fishermen community are very poor and with a view to bettering their condition, societies are being formed for them and whenever possible the fishery leases are given to such societies under the terms of the sale notification. If the lease is for three years, the society is required to pay down almost immediately one year's rental and 5 per cent deposit on the total amount. When this figure runs up to four figures, it is not possible for these poor men to raise such big sums at once, unless they have recourse to usurious money lenders whom we want to eliminate. The Komarapalaiyam Fishermen's Co-operative Society of the Coimbatore District which was given the lease of certain fisheries of the Gobichettipalaiyam Taluk for three years (vide G.O. Mis. No. 462, Development, dated 13th March 1928), have made representations regarding this and have requested a relaxation of certain rules relating to payment of instalments. The matter has gone up to Government. If, by formation of societies for fishermen and leasing out fisheries to such societies, it is intended to improve their condition financially, some concession will have to be shown to these societies in the matter of payment of rentals in advance; otherwise they will be wrecked on the rock of finance.

4. DISPOSAL OF FISHERIES IN AUCTION.—With a view to regularizing the system of fishery auctions in general and the disposal of fisheries on private tenders without having recourse to public auctions in particular, Government, in G.O. No. 339, Development, dated 24th February 1928, have laid down certain principles to be observed by all auctioning officers.

5. PROHIBITION OF FISHING BY PUBLIC WORKS DEPARTMENT.—The effect of G.O. No. 1, Irrigation (Public Works and Labour Department), dated 3rd January 1927, prohibiting fishing within the apron limits under anicuts and other irrigation works was watched during the year; though the bidders at times of sales complained about this order, it did not result in any

appreciable decrease in rentals. It is, however, too early yet properly to judge of the effects of the prohibition.

*Fishery sales.*—Fishery sales of the provincialized tanks in the Nellore and Chingleput districts, were very bad indeed. Only in the case of river fisheries were the sales generally successful. The poor rentals in the case of tanks were due to various causes, chief of which are:—

(1) Failure of rains and the consequent inadequate supply of water.

(2) Depressed economic condition of the country for the past two years owing to failure of monsoon and to the storm havoc in the Nellore District.

(3) Widespread prevalence of cholera in the Nellore District at the time of auction.

(4) Want of fishery legislation to give adequate protection to the lessees against poachers.

(5) Combination among the villagers to keep down rentals this year.

(6) The coming in of the fishery auctions of several taluks almost at the same time, owing to the rapid drying up of tanks, giving very little time to the few fishery officers to study the situation and make arrangements to break local combinations and induce outsiders to take up fishery leases.

A list of tanks which fetched comparatively low rentals will be found in Appendix IV (2).

The private disposal system was introduced to counteract the mischief created by local combinations and was to a great extent a success. It has, however, its own defects and involves a lot of correspondence. With a view to replacing it, if possible, by a better system, the Executive Engineer, Nellore, in consultation with this department invited tenders through the District Gazette for the following delta tanks:—

Kanigiri-Duvvur tanks.

Kovvur tanks.

Kodur tanks. (Departmentally fished).

Allur large and  
Ramanna tanks. } Sold by private negotiation.

He accepted the tenders for the fisheries of Kanigiri-Duvvur tanks and Kovvur tank and rejected the others. The tenderer for the latter tank paid the stipulated sum, but the other man backed out subsequently; on account of this the fishery had to be resold for Rs. 1,505 against the tender amount of Rs. 3,100. The question of taking civil action against this man is under consideration.

In the Nellore district the local combinations were so strong that in some cases tanks had to be auctioned two or three times. This involves considerable waste of time and energy to the officers both of the Public Works and of the Fisheries Departments. And the amounts realized were miserable. In the case of the Kodur-Ummidi tank, which used to fetch on an average Rs. 1,300, the compensation being Rs. 980, the fishery was sold three times and even then the villagers offered only Rs. 460. While the auctions were going on, the villagers were stealthily removing fish from the tank. The tank being a big one, fishing it departmentally is not an easy matter. After mature consideration it was decided to do it at any cost. Police help was requisitioned which was given ungrudgingly by the District Superintendent of Police; the Public Works Department and Revenue officers also rendered help. The fishing was conducted under the supervision of the Inspector by the Assistant Inspector, Ippur. In the initial stage, owing to obstruction by the villagers, great difficulties were experienced in procuring fishermen and in the disposal of the catches. These were overcome gradually and a sum of Rs. 621-11-0 was realized from the fishery. If the villagers had not stealthily removed fish from the deep pits in the tank, the amount would have gone up to more than Rs. 1,000. Apart from the gain, the departmental fishing had a most salutary effect on the morale of the villagers.

The tanks which were fished departmentally and the amounts fetched are given below:—

				RS.	A.	P.
1.	Kodur-Ummidi tank	...	...	621	11	0
2.	Puduparti tank	...	...	31	14	0
3.	Idagalli tank	...	...	35	0	0

The Ullam fishery of the Kotta Pennaka tank referred to in last year's report could not be disposed of owing to there being too much water in the tank. Unless the Ullam (deep pits) become visible it is not possible to make out a list of them and issue fish pattas to their owners. This will be done when conditions become favourable.

From the year 1922, about 1,500 catla fingerlings on an average have been released annually into the river Cauvery at a spot below the Hoginkal falls. The fishery of the river from the falls to a distance of four miles below is being conserved by the Forest Department and no kind of fishing is allowed there. Since this section forms a sanctuary for breeders, it is not auctioned. This year the Inspector of Fisheries, Nilgiris, was asked to examine this section of the river and to some extent below it, to see whether the



introduced fish have bred. He reported that no catla could be found and that the river is fished by hosts of fishermen and that all fish from the minutest fry are destroyed by all sorts of engines. This is a deplorable state of affairs and will have to be put an end to, if catla is to be permanently established in the Cauvery. But it is unlikely that this can be done before the passing of effective fishery legislation to prevent indiscriminate fishing.

#### 4. PEARL AND CHANK FISHERIES.

##### A.—Pearl Oyster Research.

It was considered possible that there might be beds of pearl oysters in deep water beyond the 9—11 fathoms on the pearl bank ordinarily fished by naked diving and that these beds might form a reservoir from which the depleted banks were re-populated whenever conditions happened to occur favourably. In G.O. Mis. No. 78-R, Development, dated 7th March 1928, Government, therefore, sanctioned a proposal to utilize the services of the trawler for conducting dredging operations for a period of three weeks.

A set of special dredges suitable for such work was prepared according to a design suggested by Captain Cribb and the operations were commenced on 27th March 1928 from the north side of Tholayiram par in nine fathoms. The pearl oysters were found to be confined to the banks in depths of  $9\frac{3}{4}$  to 11 fathoms and there were none beyond them at least up to about 20 fathoms depth. The dredging work was continued at intervals till May 30 when they had to be brought to a close on account of the heavy swell and rough seas resulting from the setting in of the south-west monsoon. The area thus surveyed extends from off Pamban to off Cape Comorin in the south and Colachel on the west coast. Some stray pearl oysters about five cm. long were met with occasionally in 5 to 9 fathoms off Upputhanni Tivu and Valinuk-kum Point. A fair quantity of adult pearl oysters were dredged from the banks off Tuticorin.

A few young oysters 1·8—4·0 cm. long were dredged from the reef off Tiruchendur (position seven fathoms, Tiruchendur Pagoda bearing south-west by west) together with a fair quantity of dead shells of similar young oysters whose death appeared to have been recent.

##### B.—Inspection of Pearl Banks.

The following banks off Tuticorin and Tiruchendur were inspected during February 1928 with the following results:—

I. THOLAYIRAM PAR.—There were enough oysters for a small fishery.

2. KARAI KARUVAL PAR.—There were no oysters. Plenty of "suram" (*Modiola* sp.) a well-known pest of pearl oyster was picked up in each dive.

3. VILLANGU KURIVAL PAR.—There were young oysters about six months old in an area of about 1/16 square mile. As there was plenty of "suram" mixed with the oysters, it is very doubtful whether these young oysters will survive.

4. TIRUCHENDUR POONTHOTTA PAR.—Very few adult oysters. Plenty of dead shells. On examination it was found that they must have died about November or December 1925, as the valves had greatly deteriorated. According to the report of the divers sand wash six inches deep in some places, in other places the rock was bare; oysters six months old were fairly numerous and there was a large quantity of "suram"; dredging confirmed the above results.

5. SANTHAMMA KOIL PIDITHA PAR AND THERADI PILU PIDITHA PAR.—Same results as at Tiruchendur Punthotta par. There were no adult oysters. All the oysters in the Tiruchendur banks seem to have perished sometime in 1925, owing to sand wash. There has recently been a spat-fall, but the chances of its survival are doubtful, as "suram" are already numerous and likely to smother them.

Beds to the north of Tuticorin could not be inspected, as the vessels and staff were busy with the two pearl fisheries and it is proposed to do this in the coming autumn.

### C.—Pearl Fisheries.

The season under report has been the most prosperous one yet for the pearl and chank fisheries and is responsible for the total revenue of about Rs. 3,96,360. This is the highest on record, since the acquisition of pearl and chank fisheries in 1801 by the British. In 1806-1807 the two fisheries brought in a net revenue of Rs. 3,14,454 and the revenue during the season under report has exceeded this by about Rs. 81,900.

There were two pearl fisheries during the year and though both were held on a small scale, they each brought in as much revenue as a large fishery. The season under report is further remarkable for the long pearl fishing period covering 97 fishing days. The net revenue from the pearl fishery section for the whole year, after deducting all expenses came to Rs. 3,38,930-10-11 against Rs. 1,83,533 during 1926-27 and Rs. 1,36,417 during 1925-26 which is the highest on record for a single fishing season.

**FIRST FISHERY.**—The first pearl fishery was commenced on the 9th November 1927 and was in the first instance sanctioned by Government for a period of one month from 9th November 1927 and was subsequently extended up to the 15th January 1928. There was fishing for 56 days and the fishery was conducted on the same lines as the one held in November 1926. The camp was located at Silavuthurai and the oysters were divided and stored in the old Kottu enclosures which were slightly modified for the purpose. The pearl merchants had their shops in the town and lived there; and the foreign divers, who were few in number, easily accommodated themselves at Tuticorin. The boats returned to Tuticorin after delivering their loads in the kottu and anchored off the Fisheries office.

This first fishery brought in a gross profit of Rs. 1,95,038-14-0; the expenditure after including all charges was Rs. 8,611-0-1. A total of 6,251,940 oysters was fished and the Government share of them amounted to 4,100,233. Many pearl merchants were present and there was a good demand on all sides for oysters. The Government oysters sold at an average of Rs. 48 per 1,000 while the Government valuation was only Rs. 16. The weather was exceptionally favourable, a thing unusual at this part of the season. The fishery was closed on 14th January 1928. The divers and fishermen who participated had good earnings. There were many who made between Rs. 500 and Rs. 750 and none less than Rs. 300.

**SECOND FISHERY.**—An inspection of the Tholayiram par was carried during the first week of February 1928, when it was found that there were still on the banks a total of about  $1\frac{1}{2}$  crores of oysters, of which 50 lakhs were fishable and the rest scattered over a large area. As the number of oysters was not very great a small fishery on the same lines as the first one was recommended and Government sanctioned it for one month from 1st March 1928. The fishery was advertised only within the Presidency and it was specially notified that about 30 boats only would be employed. It was, however, found that a large number of boats and divers were arranging to come and they had to be warned in advance that it would be impossible to utilize the services of all of them and that if they insisted on coming they would be doing so at their own risk. In spite of this, a large number of boats and divers arrived and on the 29th February 1928, there were nearly 84 boats with 1,147 divers applying for permits to participate in the fishery. Of these, 217 were Arabs from the Persian Gulf. As days went on, more boats arrived and by the 7th March the

number of boats had increased to 93 and the divers to 1,347. This caused much inconvenience and anxiety and all had to be admitted, as the rejection of a large number would have caused disappointment and trouble. All were therefore allowed half time fishing, permit being issued for alternate days only. By this arrangement, it was possible to provide employment to all of them and avoid discontentment.

The fishery was confined to Tholayiram par at a depth of 9-11 fathoms.

WEATHER.—The weather was ideal throughout the whole period. There was a favourable north-west breeze in the morning and an east wind in the afternoon which facilitated the passage of the boats to and from the bank. There was no need to engage a tug as, on calm days, the departmental launches were able to tow the boats.

Fishing commenced on 1st March 1928 with 38 boats which brought in a total of 52,700 oysters, an average boat-load being 1,350 oysters each. The boats were sent out to sea alternately until the 24th March. From the 25th, however, all were permitted, to fish as the oysters showed signs of decay. A total of 31 lakhs of oysters was fished up to 31st March against the estimated quantity of 50 lakhs of fishable oysters present and it was proposed to continue the fishery for a further period of one month or until such time as the weather permitted. Unfortunately, however, cholera broke out on 2nd April causing the death of one Tuticorin diver and a mundock (line-man from Kilakarai). This scared the divers considerably and as the epidemic showed signs of spreading, the fishery was closed temporarily in the first instance. As the disease did not abate Government in their Order Mis. No. 860, Development, dated 12th May 1928, directed that the fishery should not be re-opened.

This second fishery gave a net revenue of Rs. 1,93,483. There was fishing for 31 days and a total of 3,477,593 oysters was fished against 6,251,940 in the first fishery of the season. The Government share came to 2,303,156 oysters and these fetched Rs. 2,01,306-6-0 at an average of Rs. 87-6-6 per 1,000. The prices realized were the highest on record, the maximum being Rs. 126 per 1,000 oysters. The good prices were due to keen competition and to the frequent finding of good pearls. The probability that this might be the last fishery in the cycle was also in a way responsible for the good prices that prevailed. The fishery might have turned out to be the best one held since the beginning of British control, but on account of the unfortunate outbreak of

cholera, it could not be continued to its natural termination. In spite of this, the fishery stands first in the matter of revenue among the five fisheries held in this cycle. A statement of the receipts and expenditure of the various fisheries held since 1890 is given below for purposes of comparison :—

Year.					Gross receipts.	Expenditure.	Net profit.
					RS.	RS.	RS.
1890	...	...	...	...	25,061	17,258	7,803
1900	...	...	...	...	19,461	8,248	11,033
1908	...	...	...	...	10,218	2,936	7,282
1914	...	...	...	...	16,542	14,045	2,497
1926—							
March	...	...	...	...	2,25,455	71,062	1,54,437
November	...	...	...	...	31,387	4,585	26,802
1927—							
March	...	...	...	...	2,54,497	86,827	1,67,670
November	...	...	...	...	1,95,039	8,611	1,86,428
1928—							
March	...	...	...	...	2,02,575	9,092	1,93,483

**PROSPECTS OF NEXT FISHERY.**—There are still in the Tholayiram par sufficient oysters for a small fishery on the same lines as the one last held. It is, however, doubtful whether they will survive as they are already more than six years old. As things stand at present, there is very little prospect of another fishery during the next few years.

#### D.—Chank Fisheries.

**GENERAL.**—The pearl fishery at Tuticorin extended over practically the whole season; but the chank fisheries were held both there and in the Rāmnād District, in the interval between the two fisheries by utilizing the services of the divers immediately after the pearl fishery. This is the first occasion on which pearl and chank fisheries have been carried on in the same season in these districts.

**VALAMPURI CHANKS.**—Two were fished during the year. One was sold for Rs. 300 and the other for Rs. 250.

**ADVANCES TO DIVERS.**—A sum of Rs. 2,197-7-2 was outstanding with the divers of the Tinnevely and the Rāmnād districts at the close of the 1926-27 season. Of this a sum of Rs. 105-12-0 was written off under orders of Government (G.O. Mis. No. 2180, Development, dated 20th December 1927). A further advance of

Rs. 523-15-6 was issued mainly to help in recruiting divers for the Rameswaram and the Tirupalagudi fisheries. A large sum had to be issued at Tirupalagudi to prevent the divers there from going to Ceylon attracted by the higher wages offered. Except for a week when they struck work and asked for increased rates, they worked throughout the season satisfactorily and fished well. A sum of Rs. 471-1-3 was recovered, leaving a balance of Rs. 2,144-9-5 at the close of the season.

BOAT LOAN TO DIVERS.—A sum of Rs. 234-3-0 was outstanding as loan with three divers. Of this, a sum of Rs. 25-3-0 was recovered. A fresh loan of Rs. 100 was issued to a chank diver at Tuticorin and the balance outstanding on 30th June 1928 was Rs. 200.

I. TINNEVELLY CHANK FISHERY—*Fishing Operations.*—The following are the details of shells fished during the season:—

	1927-28.	1926-27.	1925-26.
Full sized ... ..	93,172	53,348	46,588
Undersized ... ..	9,240	3,903	6,308
Wormed ... ..	2,658	1,507	2,460
	<hr/>	<hr/>	<hr/>
	105,070	58,757	54,356
	<hr/>	<hr/>	<hr/>

Chank fishing usually commences about the last week of October or the first week of November. The pearl fishery commenced on the 9th November and no chank fishery was possible until it closed, which was on the 15th January 1928. The divers refused to commence diving immediately and began to agitate for the same increased rates that prevail in Ceylon, viz., three to four annas per chank. Most of these men had been to Ceylon during the period from July to October 1927, and had made some money in the chank fisheries there. Immediately after they returned from Ceylon they sent a petition demanding among other things three annas per chank and a smaller gauge board. The agitation was, however, foreseen and a recommendation had already been made to increase the remuneration to one anna six pies per chank which the Government sanctioned. The men were persuaded to agree to this and the fishery was commenced on the 8th January 1928. Ten canoes of 48 local divers participated in the fishery and as many as 39,650 chanks were collected by the 29th February 1928, when the chank fisheries had to be stopped on account of the commencement of the pearl fishery. As however the boats could only be allowed to engage in pearl fishing on alternate days, use was made of those divers who remained on shore and

about 36,250 chanks were fished. When on the 25th March all the boats were allowed to participate daily in the pearl fishery, the chank fishery had to be suspended.

With the stopping of the pearl fishery on the 7th April, the fishery again recommenced and this time 11 boats with 69 divers participated. A total of 93,172 chanks were fished during the whole season against 53,348 during 1926-27. The increased remuneration to divers gave them very good earnings and average earnings per head during the days the divers went out to sea was Rs. 5-10-0 as against Rs. 1-5-6 during the previous season. The increased rates have given an impetus to the chank fishery and many new men are now learning chank diving.

*Contract.*—Several merchants submitted tenders, of which the highest was from Mr. Hem Chandra Kar, a former contractor, who offered the high rate of Rs. 526-12-9 for full sized Tinnevely District shells and Rs. 8-0-0 for undersized ones. The lowest was that of the Dacca Industrial Union who offered only Rs. 350 for full sized and Rs. 25 for undersized shells. Government however sanctioned the sale to the Dacca Industrial Union at the rate of Rs. 400 per 1,000 shells for a period of three years from 1st July 1927. The difference between the rates is nearly about Rs. 13,000 over the current season's catches which the Madras Government have foregone for the benefit of the Bengal workmen.

The net profit on the Tinnevely Chank Fishery was about Rs. 23,100 against Rs. 12,747 in 1926-27 and Rs. 7,515 in 1925-26.

2. RĀMNĀD CHANK FISHERY.—A total of 145,972 shells was fished in all the centres against 67,181 chanks during 1926-27.

Fishing centres.	1927-28.	1926-27.	1925-26.
Rameswaram including Mandapam ... ..	72,488	21,638	100,962
Kilakarai including South Vedalai ... ..	3,638	3,899	8,030
Tirupalagudi including North Vedalai and Sivaganga shells.	69,826	41,644	29,500
	<u>145,972</u>	<u>67,181</u>	<u>138,492</u>

A total of 12,097 immature shells was brought ashore, of these 5,866 were returned to sea alive.

The season under report is the last year of the lease of the Rāmnād Chank Fishery from the Raja of Rāmnād, and tenders were invited for the purchase of the shells of this season only. The contract was given to the Dacca Industrial Union for one year

at the rate of Rs. 350 for Rameswaram and Kilakarai chanks and Rs. 240 for Tirupalagudi.

The net profit on this fishery was Rs. 10,292 against Rs. 4,761 in 1926-27 and Rs. 17,989 in 1925-26.

*Rameswaram.*—The season here is a very short one and commenced about the middle of February and closed by the last week of April. It is the Kilakarai and Periapatnam divers who work here and they were taken to Rameswaram from Tuticorin immediately after the pearl fishery was closed. There were only two weeks of good fishing during which period 63,631 chanks were fished. The divers had good catches, as the bed enjoyed a respite during the pearl fishery years and the average earning per day per head came to Rs. 1.02.

*Mandapam.*—8,853 chanks were fished against 11,055 during 1926-27 and 17,222 during 1925-26.

*Kilakarai.*—3,658 chanks were fished against 3,899 shells during the last year. The catches are generally poor here as fishing is done only in the inshore beds, and the annual yield does not exceed a few thousand shells. The shells are of the same quality as the Rameswaram shells and for the current season, they have been sold at the sale rates. At the commencement of the season, the divers demanded the same rates as those prevailing in Ceylon and for a week refused to commence fishing. The demand was not considered as the lease was expiring with the current season. The men were however persuaded to work.

*Tirupalagudi.*—The chank fishery here had the same labour difficulty in a more intensified form than in other places. The men struck work for some time and were arranging to go in a body to Ceylon. Petty advances were issued to those who were in need of them and they were persuaded to remain in India. Good fishing was done and 69,514 shells were collected.

*Sivaganga.*—2,116 shells were collected in the Sivaganga villages against 1,781 during 1926-27 and 1,014 during 1925-26. The fishery gave a net profit of Rs. 183-10-5.

3. COROMANDEL CHANK FISHERY—*Tanjore.*—This fishery brought in a rental of Rs. 3,710 during the season. The lease granted to Mr. M. K. Shamsuddin Maricar of Pondicherry expired on the 30th June 1928 and the fishery was leased for a period of one year to Mr. E. K. Muhammad Sultan Maricar of Karikal on an increased rental of Rs. 6,811. Proposals are before Government for working the fishery departmentally.



*South Arcot.*—This is the first year of the three years lease granted to Mr. M. K. Shamsuddin Maricar of Pondicherry. The rental realized was Rs. 1,670.

*Chingleput and Nellore.*—A rental of Rs. 1,003-5-4 was realized against Rs. 760 for the previous season.

### 5. BIOLOGICAL SPECIMEN SUPPLY.

The progress in this work is being steadily kept up. The value of specimens sent out increased from Rs. 3,928-11-0 last year to Rs. 5,045-15-0 this year. As usual the North Indian Universities were our largest customers. Four Colleges in the Punjab, the Colleges in the Gwalior and Kolhapur States and three English Universities were among our new customers. The Mysore State has purchased specimens for eight of its high schools. Ten species of Echinodermata identified by Dr. Devanesan were added during the year to the named collection at Ennur. Appendix VI shows the list of institutions served.

Work was commenced at Calicut in the isolation of microscopic marine organisms for supply purposes.

During the investigation into the bathymetrical distribution of pearl oysters by the Trawler "Lady Goschen" prolific beds of Amphioxus and big Ascidiæ were discovered and several hundred specimens were collected for the use of the Biological Supply Section. The position of this ground is Hare Island bearing N.W. and Trichendur Pagoda bearing S.W. by S. in 9½ to 10 fathoms depth with fine red sand bottom.

### 6. ANTI-MALARIAL WORK.

1. Two ponds in Gambier's Gardens, Adyar, were stocked with larvicidal fish at the request of Mr. A. Y. G. Campbell.

2. Specimens of larvicidal fish were supplied to Captain, Back Bay Scheme, Bombay.

3. Information about larvicidal fish and their utility for combating malaria was furnished to Captain Narasinga Rao, Anatomy Lecturer and Secretary, Health Exhibition Committee, Coimbatore.

4. Twenty-six water-holes in the Nallamalai Hills were stocked with 12,800 larvicides. Forest people are of opinion that our stocking operations are to some extent effective in keeping down malaria in and around the operated places.

5. The Vellore and Chingleput Fort-moats were cleared of noxious water weeds such as water-hyacinth, etc., which give good shelter for mosquitoes to breed and multiply, and stocked with larvicidal fish.

6. Larvicidal fish were exhibited in the following exhibitions held at Madras:—

(a) Young Men's Christian Association exhibition held in August 1927.

(b) All-India Agricultural, Industrial and Khaddar Exhibition held in December 1927.

(c) Industrial Exhibition held during the Madras Park Fair and Carnival of Sports held in December 1927.

## 7. SOCIO-ECONOMIC WORK.

### A.—Education.

1. FISHERIES TRAINING INSTITUTE, CALICUT.—The Fisheries Training Institute reopened after the monsoon vacation on 8th August 1927 and continued its usual work till the school year ended on 14th June 1928.

*Syllabus.*—The syllabus in Fisheries technique was thoroughly revised. The new syllabus is a comprehensive one touching all aspects of fishery science. The introductory part deals with the importance of fisheries and shows how far that importance has been recognized in different ages and in different countries. This is followed by a section of the great fisheries of the world showing the physical conditions that render certain areas of the ocean specially productive, the varieties of fish caught in such localities, and the fishing methods employed. The next chapter deals with marine products of economic importance with special reference to South India. Then follow two sections dealing with the preservation of fish as food and the manufacture of bye-products such as oil and manure. The remaining sections are on pisciculture, oceanography, fisheries legislation, and the administration of fisheries in relation to health and fishery economics.

More apparatus is urgently required for making the teaching of fishery technique according to this syllabus really effective. But it cannot be supplied until the additional accommodation referred to below is provided.

*Pupil teachers.*—The Selection Committee met at Mangalore on 16th July 1927 and at Calicut on 19th July 1927. Four Kanarese and twelve Malayali students were selected for admission. The

Institute had on reopening a total of 36 pupil teachers including the new admissions. But one of the latter left soon after to continue his studies in a high school, one was unable to secure a certificate of physical fitness and one had to be discharged for inefficiency. Thus the strength was reduced to 33. Four of these were Muhammadans, four Christians and the rest Hindus. One of the Hindus belonged to the backward class of Ezhuthachans. The rest were fishermen by caste. Among the Christians one was a woman. Twelve pupil teachers sat for the final examination, eight passed, four being placed in the first class. Four old students also passed this year and thus completed their certificates. There were six Kanarese pupil teachers, all fishermen by caste, undergoing training at Mangalore and two of them completed their course there.

*School work.*—Greater attention has been paid this year to the teaching of Fisheries technique than in the previous years. The school was inspected by the District Educational Officer on 23rd February 1928. He says in his inspection report that “the school is doing fairly satisfactory work as far as circumstances permit.” He draws attention to the urgent need of a playground.

The students twice went on excursions to Tanur spending a full week there on each occasion. From September to March they had daily practice in boating and a batch of three students went each day for fishing. The proceeds of the fish caught by the students and remitted to the treasury amounted in all to Rs. 226-13-0. The carpentry section was inspected as usual by the Inspector of Industrial Schools. All the students except one passed in the examination.

The Pupil-teachers' Literary Society and Games Club worked actively throughout. But the reading room conducted by the society was much too small for the purpose, the room intended for it being used for keeping nets. The school competed in the Y.M.C.A. Sports and two students and one teacher secured medals.

The Students' Co-operative Society was very useful in imparting a practical knowledge of co-operation to the pupil teachers. Arrangements are being made to do some non-credit work on the indent system in the coming year, the idea being to purchase clothes and stationery jointly.

The scout troop continued to work efficiently. It consisted of 24 sea-rovers, three scout instructors and a scoutmaster, all the



Madapalli Higher Elementary School, managed by the Fisheries Department.

four last being members of the staff. Nine members of the troop attended the Viceroy's rally at Ootacamund in August and seven attended the All-India Scout Jamboree at Bombay in December 1927. A special feature of the troop activities during the year under review was active participation in the campaign against plague. The troop greatly helped the municipal authorities in collecting villagers for inoculation and in other preventive measures. The District Collector wrote to the scoutmaster appreciating the services rendered. The troop also helped the Malabar Welfare Committee in their varied activities, particularly in running the Child Welfare and Maternity centres. The District Educational Officer says in his inspection report of the Institute for the year—"There is an efficient troop of sea-rovers and the scoutmaster is to be congratulated on his work."

2. SCHOOLS.—Excluding the Vellayil Day School, which is directly under the Headmaster of the Fisheries Training Institute, there were 29 day schools and 4 night schools at the beginning of the year. Three new schools were started, one at Palapatti, one at Kadavanad and the other at Pudiappa. The Palapatti School was started with two teachers in August but grew so rapidly that within three months a third teacher had to be appointed. The total number of schools at the end of the year including the Model School was 37. The total number of pupils reading in the various Fishery Elementary Schools rose from 2,440 to 3,000 of which 868 were girls as against 703 in the previous year. The total number of teachers employed was 107 against 89 at the end of the last year. Of these 78 have been trained at the Fisheries Training Institute, and 21 in ordinary training schools while 8 are untrained. The corresponding figures for the previous year were 56, 17 and 16.

Two new schools have been sanctioned, one at Kirimanjeshwar and the other at Udayawar. But they have not yet been started.

The schools at Kaipamangalam, Nattika, Talikullam and Kottakadapuram show satisfactory progress. An additional teacher each for Nattika, Talikulam and Kottakadapuram and two for Kaipamangalam were sanctioned in April. Kaipamangalam, like Madapalli is a Higher Elementary school. The schools at Nattika and Talikulam have been showing such satisfactory progress and the children are evincing so much interest in their work, that it will be a pity if these two schools are not soon raised to the higher elementary standard. Proposals for this were submitted last year, but were rejected. The Blangad and Puthenkadapuram

schools are not showing such good progress as was expected but nevertheless their working is on the whole satisfactory. The Kundazhiyur school which was showing good progress is now showing a decline. The cause of this is attributed to the existence of factions in the village. The Tanur Night School does not appear to be working satisfactorily. Of the four temporary schools, two (Palapatti and Kadavanad) were those opened this year and both are now promising schools. With the appointment of an additional teacher, the Mannalamkundu school whose progress was not satisfactory is showing improvement. The Veliangode school, which is for Mopla children is not progressing, in spite of the appointment of two Mopla teachers as Headmaster and Assistant.

All the permanent schools in South Kanara are housed in masonry buildings. The temporary schools at Byndoor and Kumbala are, however, accommodated in temporary sheds. The temporary shed of the Parappanangadi school is not only in disrepair but is also not spacious enough for accommodating the pupils whose number is increasing. Efforts to get the shed extended have proved unavailing. A local Jenmi who has promised to build a shed has so far failed to keep his promise. The only alternative seems to be for the Government to put up a suitable building. The school is now a temporary one but there is justification to make it permanent. Compulsory elementary education has been introduced in the village and the attendance is not likely to diminish to any great extent provided we keep a Mussalman teacher at the school.

The Kadalundi school building is on a par with that of Parappanangadi in respect of unsuitability. But the owners of the shed have been constructing a masonry shed for the last two years. The building is reported to be nearing completion and is expected to be ready to be taken over in a few months.

The Chaliyam school is located in a temporary shed owned by the Department. The Government have sanctioned the construction of a permanent building. The site has got to be acquired.

The Pudiappa school though a temporary one at present, is so popular that the question of making it permanent is likely to arise at no distant date. It is now located in a thatched shed owned by the villagers.

The Quilandy school has been shifted to a strongly built shed erected by the Department with space to accommodate 100

children. There were nearly 70 children when the shed was constructed. The present strength is 121. Extra land has been acquired for putting up an additional shed also to provide a school garden.

The Kuriyadi school has accommodation only for 60 children and admission has been restricted. Twice as many children are reported to be seeking admission. The Government have sanctioned the construction of a permanent building but as in the case of Chaliyam school the site has got to be acquired.

The Madapally School building whose accommodation was sufficient for the strength of the school two years ago had to be extended to accommodate the additional number of children who have since joined the school. It is a rented building.

The school building at Kaipamangalam is a masonry building constructed this year. The Kadavanad and Mannalamkundu school sheds belong to Government. If the present rate of progress is maintained, a masonry building will have to be constructed for the Kadavanad school ere long. The question of constructing a permanent building for Mannalamkundu school is not so urgent. The buildings at Talikulam, Kottakadapuram, Blangad and Puthenkadapuram are rented ones. The schools at Kundazhiyur and Nattika are in temporary rented buildings. The owner of the Kundazhiyur school building collected some materials two years ago and gave an assurance that he would let the building when constructed for a fixed rent. But he had failed to construct the building till now. The Nattika school, the permanent retention of which was sanctioned during the year, will have to be provided with a permanent building by the department as the villagers are unable to construct one to be rented out to Government. The progress of the Valiangode school is not such as to justify the construction of a permanent building. Palappati school though opened only in August last year has shown satisfactory progress and it will have to be provided in the near future with a permanent building.

3. OTHER EDUCATIONAL WORK—*Scouts*.—Scouting activities were extended outside the Fisheries Training Institute to the villages this year. As a result of the Cub-master's training camp specially held in June 1927 for training the Fisheries Rovers in cubbing, six cub packs with a strength of 67 cubs and two scout troops with 28 scouts were started all of which are doing useful work in their respective villages.

*Students' training.*—One student, K. C. Kesavan Pillai, employed in the Travancore Fisheries, studied at the Tanur Experimental Station for three months. He could not complete his course on account of ill-health. Two others were granted permission but did not come.

Mr. Athawale, Official Chemist to the Government of United Provinces and his party of six students visited the station on 27th March 1928.

The Krusadai Biological Station was visited by Professor Rao and a batch of his students from the American College at Madura on 28th January 1928.

*Aquarium.*—The number of visitors for the year was 104,401 as against 112,303 in the previous year, but the number of visitors at the 4-anna rate was 9,409 as against 7,932 of the last year, so that the gate money was more in proportion to the number of visitors. The Aquarium was, moreover, specially reserved for purdah parties of Royal Families and Zamindars at an enhanced rate of Re. 1 per head on 9 occasions against 4 of last year. The record attendance for the year for any single day was on Kanna Pongal day when 3,760 persons visited the Aquarium as against 4,109 of last year.

The following table shows the monthly and average daily attendance for 1927-28:—

Month.	7 a.m. to 5 p.m.	5-30 p.m. to 7 p.m.	Total for the month.	Daily average
1927.	RS.	RS.	RS.	RS.
July ...	6,346	537	6,883	222
August ...	4,846	433	5,279	170
September ...	5,866	485	6,351	211
October ...	6,555	557	7,112	229
November ...	5,587	466	6,053	202
December ...	20,010	2,821	22,831	736
1928.				
January ...	14,578	939	15,511	500
February ...	5,616	602	6,218	242
March ...	6,080	636	6,716	217
April ...	6,417	666	7,083	233
May ...	6,434	677	7,111	229
June ...	6,663	590	7,253	241
	<hr/>	<hr/>	<hr/>	<hr/>
	94,992	9,409	1,04,401	286
	<hr/>	<hr/>	<hr/>	<hr/>



The daily average attendance for the year is 286 as against 309 of last year. This was largely due to the fall in the number of visitors during the period of the cholera epidemic. The marked increase in the daily average attendance during December and January is due mainly to the sessions of the Indian National Congress held at Madras during this season and to the opening of the All-India Industrial and Khaddar Exhibition at Madras.

Two hundred and fifty students from different schools and Colleges accompanied by their teachers visited the Aquarium for demonstration purposes.

Among the visitors this year were His Excellency Sir William Birdwood, Commander-in-Chief for India, Lord and Lady Grimthorpe, Lord and Lady Strafford, Sir John Simon, Lord Burnham, Lord G. R. Lane Fox and Lord Strathcona, Tourists of the Round the World Cruise Canada of the Pacific Railway (Empress of Australia), Professor Dr. Edmund Graefe of Dresden, Germany, Sir J. C. Bose, Raja J. P. Subadar Singh of Nepal, Brigadier-General Charles Rudkin, His Highness the Maharaja of Benares, His Highness the Ex-Maharaja of Indore, Sir Mirza M. Ismail, Diwan of Mysore and Mr. A. McG. C. Tampoe, Secretary to Government, Development Department.

**B.—Co-operative Societies.**

1. WEST COAST.—The societies started by the Fisheries Department at Blangad and Palapatti began work during the year under report. They are working satisfactorily though the amount repaid is less than was stipulated. This was due to the fact that though the catches were phenomenally heavy, the price obtained was less than what would have been realized had the catches been normal. The actual fishermen who caught the fish were not benefited by this abundance as the market for dried fish was dull. Towards the loan of Rs. 1,500 borrowed from Government the Blangad Society was able to remit Rs. 575 in six instalments with a sum of Rs. 89-9-5 for interest. Of a similar amount borrowed by the Palapatti Society Rs. 500 was remitted in five instalments and Rs. 101-15-0 towards interest. The amount fixed to be repaid by each society by the end of the year was Rs. 650. The Palapatti Society had also borrowed Rs. 500 from the District Co-operative Bank for purchasing foodstuffs during the slack fishing season. Out of this amount Rs. 200 has been repaid. The

intensive supervision that was exercised by the Fisheries Department over the working of these two societies is largely responsible for the success of the societies. The sale-proceeds of the catches of the Blangad and Palapatti societies were Rs. 2,177-3-0 and Rs. 2,150-8-0, respectively. The society's share in the catches were Rs. 642-2-0 and Rs. 659-7-6, respectively.

There were 19 fishermen's societies in the South Kanara district as against 20 in the previous year. The progress of these societies is not encouraging. The indebtedness of societies has increased and their transactions are very limited. Only nine societies seem to have had any transactions during the year and the rest are practically doing no work.

In Malabar the number of societies was 37. Their condition is showing some improvement. The best-conducted societies are the Women Curers' Society at Cannanore, the Azhicode Society, the Madapalli Curers' Society and the Thalayi Curers' Society. It was at one time proposed to wind up the Women Curers' Society. But it was taken in hand by the Sub-Inspector of the Cannanore yard and it is now one of the best-conducted societies on the west coast. The members have thorough confidence in the society and look upon it as a blessing during the non-fishing months. It borrowed twice from the District Bank and paid back both loans before the time allowed for repayment had expired. The society purchased foodstuffs and supplied them to the members in place of loans. Loans were recovered readily daily during the busy season. The Yard Sub-Inspector is attempting to arrange joint purchase and sale of fish by the members of the society to save them from the clutches of capitalists and middlemen.

The Tiruvani Society of Tellicherry was in a bad state and the Co-operative Department proposed its liquidation. The Inspector asked for a year's respite for the society and with the help of the Yard Sub-Inspector at Tellicherry worked for its revival. Their efforts have been successful. The society has improved and is in a much better condition than last year.

The Muzhupilangad, Vellor, Koraphuzha, and Beypore societies, which practically did not work last year were active during the year under review. With the exception of the Kadalundi, Chaliyam, Puthiangadi, Pudiappa, Kolla, Quilandy, and Meladi societies, all the societies in the Calicut section have shown decided improvement.

A serious handicap to the success of the societies is the lack of suitable office-bearers who are prepared to do honorary work without compensation.

Two new societies were organized at Vekkode and Nattika, respectively, and the necessary applications were forwarded to the Deputy Registrar of Co-operative Societies. They could not be started before the close of the year as the papers were still pending with the Deputy Registrar.

The registration of the societies at Tanur and Velliangode has been cancelled. The societies at Perinham, Kaipamangalam and Pallipuram did some work, but nothing appreciable. The Kundazhiyur Society, which, at the beginning of 1926-27, was not working satisfactorily on account of communal difficulties was revived for some time through the efforts of the Inspector of Fisheries, but has fallen back again on account of fresh communal troubles. The Talikulam and Vadanapalli societies which were revived at the beginning of the year with the help of school-masters did some transactions for a short period. The Puthangadapuram Society did practically no work during the year. The President of the society was keeping heavy cash balance in spite of a resolution passed two years ago that he should deposit the money in the treasury until the overdue loans were collected. The Chettuvayi Society also suffers from communal splits. The Blangad Society can be revived with the help of the President who is an influential man in the place.

The "Chit-Fund" or the "Kuri System" is very prevalent in the Ponnani Taluk and this stands in the way of the spread of the co-operative movement. Fishermen are under great obligations to do their duties by these chit-fund societies lest they should be ostracised by their community. The ordinary thrift societies started for fishermen are not of much help during the non-fishing months or for the purchase of boats and nets. The fishermen therefore prefer the chit-fund to them.

Fishermen's societies cannot be revived unless the Fisheries Department interests itself in their work. A proposal was submitted last year to employ two officers on Rs. 20 each to look after the Fishermen's co-operative societies. The proposal is still under the consideration of the Co-operative Department. Last year the Registrar of Co-operative Societies invested the Inspectors of

Fisheries with powers to call for the accounts of societies and this has enabled the Inspectors to enforce the production of books. During the year under review the Assistant Director of Fisheries has been invested with the powers of an Assistant Registrar of Co-operative Societies. The transactions of fishermen co-operative societies are given below :—

Particulars.	1926-27.	1927-28.
Male members ... ..	2,464	2,361
Female members ... ..	318	219
Total number of members ... ..	2,782	2,661
	RS.	RS.
Paid-up share capital ... ..	62,848	58,686
Total of loans disbursed ... ..	84,138	83,309
Total of loans for payment of prior debts ... ..	36,397	41,591
Total of loans for industrial purposes ... ..	27,912	23,322
Total of loans for other purposes ... ..	19,829	18,306
Total of loans received from Central Banks ... ..	9,086	17,908

2. INLAND.—Through the help of the officers of the Co-operative Department, the co-operative work among Inland fishermen progressed satisfactorily during the year. In addition to the societies already in existence, a society for the fishermen of Karunthattangudi (Tanjore District), was formed and the question of giving them the lease of the Vennar-Vettar fishery of the Tanjore Taluk is under the consideration of Government.

In Trichinopoly Town there is a large population of Muhamadans, whose sole profession is fishing. They are very poor and have no other means of livelihood. With great trouble, a society for these people was formed by the Deputy Registrar of Co-operative Societies, Trichinopoly, and the question of giving them on lease, the Trichinopoly Taluk fishery with effect from 1st July 1928, is under consideration.

In addition to the above, the fishermen of Kandukur in the Nellore district were induced to form a society for themselves, so that they may take up the fishery leases of some of the tanks in and near Kandukur town. The Chief Inspector, Co-operative Department, made enquiries and the necessary papers for the registration of the society were sent up to the Deputy Registrar. A society will be soon formed here. It is hoped that other societies for similar

purposes in the Kandukur and other taluks of the Nellore District may also be formed. The Assistant Registrar, Nellore, is taking a keen interest in the matter.

The Deputy Registrar, Bellary, is trying to form societies for the fishermen of Kurnool and Markapur towns. Attempts are also being made to form a society for the Chingleput fishermen.

In Appendix V are given the provincialized fisheries leased out to the various fishermen co-operative societies together with the lease period and the amount.

### C.—Other Socio-economic Work.

WEST COAST.—All the associations referred to in last year's report continue to work. The activities of these organizations and the propaganda of Fisheries Officers have resulted in an awakening of the community and an appreciable improvement is noted in social and economical conditions. All the maritime taluk boards with the exceptions of Coondapoor and Ernad have fishermen members on the board. Fishermen are also represented as Honorary Bench Magistrates. Mr. Soma Marakala of Malpe has started a factory for freezing fish, a novel venture on the west coast. The success of this enterprise is being keenly watched. The Department of Industries is co-operating with the Fisheries Department in helping Mr. Soma to work the factory. A social service organization entitled "The Aryajana Social League" was started during the year at Tellicherry with branches at the various fishermen villages from Kasaragod to Calicut. Its aim is to improve the condition of fishing folk in all directions. The year was mainly devoted to organization, enlisting members and collecting funds. The league hopes to effect substantial improvements in the social and economic condition of the fishing population.

The work of the departmental officers towards the promotion of cleanliness and habit of temperance and frugality in fishermen was continued during the year. The relations between the fishing population and the officers of the Department were entirely cordial and the villagers come to Fisheries Officers for advice and assistance.

The fishing community lost one of its most energetic and public-spirited leaders by the death of Rao Sahib P. V. Gopalan on 18th June 1928. He was a Special Magistrate and on resignation had just been nominated a member of the District Board. He was for

three years a member of the Legislative Council and one of the members of the Selection Committee of the Fisheries Training Institute.

Cholera broke out early in December in Malpe. The yard staff at Malpe rendered every possible help to the Health Inspector in chlorinating wells and disinfecting houses. Since there was a natural prejudice against inoculation among the public, the yard staff gave the lead by offering themselves for inoculation.

Though large quantities of fish were obtained during the year owing to its very abundance it did not materially improve the economic condition of fishermen, the prices realized being very poor. The social and economical condition of the fishing villages showed appreciable improvement during the year. The younger generation are not so much addicted to drink and other evil habits as are their elders. The fisheries schools are diverting the attention of the younger members of the community to better things, and those who have completed their studies in the lower standards show a great desire to prosecute their studies further.

The local boards were utilizing the licensing provisions of the Local Boards Act as a source of income, but the Government have reduced the licence-fee. They are now demanding profession tax from those who are scarcely able to earn enough for their sustenance. Appeals elicit the reply that the tax should be paid before they can be entertained. Such action by local boards has the effect of driving fish-curers from public fish-curing yards, and illicit curing of fish under unhygienic conditions is on the increase; and unwholesome tainted fish which will be condemned by, and for which no salt will be issued in a fish-curing yard is cured with an insufficient quantity of dirty bazaar salt. Thus these curers escape not only the rigorous enforcement of the yard rules, but also payment of licence fees and profession tax. There have also been cases of prosecution for nuisance under the Penal Code or the Town Nuisance Act.

## 8. PROPAGANDA.

### A.—Fisheries Exhibitions.

The Inland section participated in the following exhibitions during the year exhibiting fishing appliances and live fish:—

- (1) The Y.M.C.A. Exhibition held in August.
- (2) The All-India Industrial and Khaddar Exhibition held in December.

(3) The Industrial Exhibition held during the Madras Park Fair in December.

The live specimens of gourami, etroplus and larvicidal fishes attracted the attention of the public and Mr. C. T. Chetty, Proprietor of the Indo-American Drug Company, Madras, purchased a few gourami and etroplus for breeding purposes.

A large number of interesting fishery exhibits was collected during the year for the Indian gallery of the Imperial Institute.

As a sequel to the conference of heads of departments held during the year, notes on fish and fish culture in ponds, tanks and wells were drawn up. With a view to popularizing larvicidal fish and etroplus, two wells in the Coimbatore Agricultural College compound were stocked with them at the instance of the Director of Agriculture. The wells were selected by Assistant Director (Inland) after personal inspection; the fish thrive in them excellently for some months, but were suddenly found dead. The cause is being investigated, and meanwhile it has been decided to stock two other wells. This will be carried out shortly.

In July 1927 half a dozen gourami were supplied free to Mr. E. N. House of Puthuthottam Estate, Anamalais, for breeding purposes with the results already noted above.

#### B.—Miscellaneous.

*Advice.*—The Deputy Chief Engineer, Loco Workshops, Free-landgunj, Panch Mahal District, Bombay Presidency, was advised as to the fish most suitable for stocking one of the railway company's reservoirs recently constructed.

The President, District Board, Chingleput, was advised as to the methods to be adopted for improving the fishery of Tirumullai-voval temple tank.

*Fishery rights, etc.*—The right of Panyam fishermen to the fisheries of three irrigation tanks in and around Panyam (Kurnool District), was investigated and their rights in respect of two tanks were recognized—vide G.O. No. 5066, Miscellaneous L. & M., dated 21st December 1927.

The question of increasing the rentals of certain provincialized tanks in the Coimbatore Taluk, fisheries of which are enjoyed by the local fishermen under fish patta had been dropped by Government—Vide G.O. No. 2357, Miscellaneous Revenue, dated 22nd November 1927.

*Game protection.*—During inspections of the Bhavani and the Moyar, the slopes were inspected with regard to game protection work and no cases of poaching were reported therefrom. There were four Mahseer fishermen in the protected area of the Bhavani above Niralai during December 1927 who paid licence fees of Rs. 50 for coarse fishing.

## 9. COMMERCIAL WORK.

### A.—At the Chaliyam Cannery.

As in the last two years the Cannery continued to work directly under the control of the Director of Fisheries with manufacture suspended.

The year opened with a balance of 131,048 tins and closed with a balance of 23,672 tins. The tins consigned to Messrs. Menon Son & Co., London, in January 1925, were taken back, which increased the stock by 3,228 tins. 107,155 tins were sold, 3,318 tins written off as damaged goods, and 131 tins given away as samples. Of the sales, 103,900 tins were exported to Burma and sold there at a reduced price through the agency of Mr. M. C. Madhavan. Out of the closing balance of 23,672 tins, 20,510 tins have since been written off as damaged goods in G.O. Mis. No. 1022, Development, dated 16th June 1928. The number of sound tins now remaining at the close of the year is only 3,162.

In G.O. No. 574, Press, Development, dated 29th March 1928, the Government directed that such of the stores, including the empty containers as will lose in value through storage should be disposed of at once. An auction sale was held at the Cannery on the 19th May to dispose of these stores but without success. Further steps are being taken to dispose of them by other means.

The Inspector of Fisheries, Vizagapatam, reports that a sum of Rs. 42-4-0 was realized by him from the sale of canned goods and was credited to the accounts of the Cannery. He adds that of late there has been a great demand for canned goods in the Circars, but that as the small stock supplied last year was exhausted long ago and as the Cannery had not as yet commenced manufacturing the goods, the customers had to go disappointed. It is however hoped that if the Cannery begins work again a market will be obtained there. Some of the local shop-keepers, who were approached on the subject, have promised to take up the business on a commission basis.



**B.—At the Tanur Experimental Station.**

*Fish-curing.*—81,675 lb. of fresh fish was purchased for Rs. 2,111-14-11 (or 0'49 pies per lb.) as against 78,764 lb. of fish for Rs. 3,033-10-10 (or 0'675 pies per lb.) last year. Of this 30,902 lb. were prawns and 31,607 lb. mackerel as against 57,200 lb. of prawns and 6,250 lb. of mackerel last year. The variations in price in the two years are due to the nature of the fishing season. The standardized methods of curing continue to be employed. The total output was 29,543 lb. of cured fish and 3,421 lb. of prawn shells. Of the former 17,800 lb. were wet salted or pickled and the rest light cured, salted or smoked.

*Oil, fish meal and manure.*—72'72 tons of fish and bones were purchased for Rs. 1,412-3-6 or Rs. 19'4 per ton as against 40'25 tons at Rs. 23 per ton last year, and Rs. 13-10-0 in 1925-26. The price is lower than in 1926-27 on account of the heavier catches and are higher than in 1925-26 as the fish was mackerel instead of sardine. In addition to this 5½ tons or 1,320 gallons of first class fish oil was purchased from the Kerala Soap Institute, for refining and sale. The total output excluding the oil purchased, was 27,566 lb. of fish meal, 5,633 lb. of guano and milled fish, 423 gallons of oil, and 1,383 lb. of bonemeal as against 10,598 lb. of fish meal, 3,292 lb. of guano and 248 gallons of oil last year and 1,383 lb. of bonemeal.

Mackerel formed 70 per cent of the fish treated. The oil obtained from them comes to 1'595 per cent of raw weight of fish, the maximum being 2'46 per cent at the end of November. The percentage is thus decidedly lower than that of sardines, which gave 10 per cent in November and a maximum of 20 per cent in 1921-22. The percentage of stearine in mackerel oil is nearly ⅔, as against ½ in sardine oil.

*Sales.*—The sales during the year amounted to Rs. 13,256-4-1 as against Rs. 14,573-12-11 last year. The demand was greater than the output for semi-dried prawns, sardine fish meal, sardine oil, bonemeal and the better varieties of food fishes. Neither private curers nor demonstration sheds could supply any of these articles. For wet salted (pickled) mackerels, the demand was not so keen as it was last year. The appearance of fresh mackerels in shoals even in June have kept the markets filled with plain salted dry fish. As a result of this nearly two-thirds of the stock has yet to be sold. A market, however, exists for it till August. The sale of fish meal was lower than that of last year on account of the small output caused by the scarcity of sardine shoals

With mackerel fish meal, the main bulk of the fish meal manufactured this year, the customers were less familiar and it was more expensive. Some regular customers, such as the Carnatic Mills, Madras, were not willing to try the effect of mackerel fish meal on their livestock and on that score discontinued supplies. Others refrained from buying it on account of its price (Re. 0-4-0 per lb.). In the absence of sardine meal at Re. 0-1-0 per lb., although its sale is slowly developing it cannot be expected to become so popular. The Mental Hospital, Tanjong, Rambutan, in the Straits Settlements, and the Professor of Agriculture, Agricultural College, Mandalay, tried our samples on livestock and found it highly nourishing, but could not be persuaded to purchase, as in their opinion, the price (Re. 0-4-0 per lb.) was too high. They were not prepared to pay more than Re. 0-2-9 per lb.

*Factors limiting sales.*—Unhappily no fish, except sardines in some years, is sufficiently cheap for the manufacture of fish meal at a marketable price. The sale of fish meal is also handicapped by the want of sufficiently detailed information as to its use. The present instructions regarding the daily quantity to be given to each kind of animal or bird, the mode of making it palatable, the nature and proportion of the accompanying foods, etc., are based on the report of the Ministry of Fisheries and Agriculture of England. As the climatic conditions, habits of the animals, etc., are very different in India from those in England, these instructions require revision based on fresh study, in relation to Indian conditions.

*Advertisement.*—The products of the Tanur Experimental Station were exhibited at the Co-operative Exhibition at Ponnur and Perinthalamanna, at the Agricultural and Industrial Exhibitions held at Madras in connexion with the National Congress, at the Park Fair Exhibition, Madras, at the Imperial Indian Industrial Exhibition, Delhi. The products were advertised in "Poultry Farming in the East, Lucknow," "Thackers Directory, Calcutta," "The Dehra Dun Poultry Exhibition Show Catalogue," "The South Indian Planters' Directory," "The People's Herald, Agra," and "The Villagers' Calendar, Madras." The first and the last appear to have been much the most successful.

### C.--On Board the trawler.

The five trawling hauls made off the Madras Coast in September brought in 853 lb. of fish mostly shark, red snapper, bream, horse mackerel, rock cod, etc., realizing in all Rs. 57-1-11. All the

catches were poor owing to the rocky nature of the sea bottom in places explored. Damage to the nets was frequent and considerable time and labour was needed for mending them. Whether suitable trawling grounds exist anywhere in the neighbourhood of Madras can be definitely stated only after further trawling experiments have been conducted in this area.

The trawler left Madras on 22nd October 1927 arriving at Tuticorin on 31st October 1927. On 30th October 1927 before reaching Tuticorin, she caught 373 lb. of miscellaneous fish (rays, red snapper and bream being the chief). This was sold fresh the next day at Tuticorin but only fetched Rs. 23-8-0. Subsequently, the catches were gutted and salted on board with duty free salt taken for the purpose. This enabled the trawler to make longer cruises, though it entailed additional work and strain on the crew.

The fishing experiments were mostly confined to the Manapad and the Cape Comorin plateau stretching from the 20-fathom to the 100-fathom line, but two hauls were made off Calicut while the trawler was awaiting the unloading of salt schooners. Altogether 60 hauls were made with the trawl between 30th October 1927 and 30th May 1928 in the above area. The total quantity of fish caught was 27,683 lb. of which 2,036 lb. were sold as fresh fish realizing Rs. 108-1-11, the rest being cured, first on board the trawler and subsequently in the Church Island fish-curing yard by the Fisheries Overseer there.

Ten gallons of shark and ray liver oil were sold for Rs. 10-15-0. A small number of shark skins was sold for Rs. 7-12-0. Out of the stock of cured fish only 594 lb. were sold for Rs. 72-2-6 and the rest are awaiting disposal. The average catch per trawl hour was 145 lb. and the number of days the trawler was engaged in trawling was 31.

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## PART II.

### FINANCE.

*Summary of financial results.*—It is gratifying to note that the transactions of the Department during the year under review resulted in a net profit of Rs. 99,169 which is the record figure reached since its inception. Vide Appendix No. II. The outstanding events of the year were the two remarkably successful pearl fisheries which may for all practical purposes, be taken as a single fishery with an interval of a month and a half in its course. The pearl fisheries alone brought in a gross profit of Rs. 3,97,614 ranking first since the acquisition of the pearl and chank fisheries in 1801. The chank fisheries were responsible for a gross profit of Rs. 85,920 in spite of the divers being mainly employed in the pearl fishery. The fishing season was very favourable on the west coast and was responsible for a net profit of Rs. 17,473 from the fish-curing yards there notwithstanding the heavy transport charges that had to be incurred on the large quantity of salt transported by rail. The net profit on the working of all the fish-curing yards, however, amounted to only Rs. 3,894 against Rs. 6,256 last year. This is due to the poor fishing season in the Northern Circars, and effects of a cyclone on some of the yards in the central section of the east coast. The Tanur Station worked at a small profit of Rs. 231 against the loss of Rs. 1,303 last year. The Aquarium continued to be a source of revenue, the net profit being Rs. 3,111 against Rs. 2,437 of the previous year. The Zoological supply section was self-supporting adding its quota of Rs. 7 to the revenue against the loss of Rs. 1,634 in the previous year.

2. The principal sections which have been less remunerative than usual are the Cannery and the fish and oyster farms. Though there was no manufacture at the Cannery, the disposal of the old stock at considerably reduced prices, the writing off of a large portion of the old stock as damaged and the usual debit of such items as interest, audit fee, depreciation, etc., were responsible for a net loss of Rs. 41,885 against Rs. 20,844 of last year. The revenue from the Inland fisheries fell from Rs. 1,05,254 to Rs. 1,01,257 due to general failure of the north-east monsoon while the expenditure rose from Rs. 1,01,818 to Rs. 1,14,205 resulting in a net loss of Rs. 12,948. The Oyster Farm at Pulicat shows a loss of Rs. 1,264, this year on account of the failure of the supply of oysters fit for sale during the best part of the season both at Pulicat and at Ennur.

3. The usual financial statements are appended.

PART III.  
STAFF AND EQUIPMENT.

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I. BIOLOGICAL.

Throughout the Department, biological research is handicapped by the limited experience of the workers. Biological students at Indian Universities still have few facilities, and in the past had none, for private work at Marine Biological Stations. And even where the facilities exist, the cost involved in living and working there coupled with an inadequate appreciation of its importance among their instructors, combine to prevent extensive annual use of them such as is common in Europe. As a result, students leave college with no idea of the possibilities of marine biological research work. And those who enter the Fisheries Department have to get what further guidance they can from the Director on his occasional visits to their headquarters and even then only during such time as he can spare from administrative work. The research work done, therefore, imperfect though it be, is much to the credit of those workers who have successfully come through this discouraging preparation for it.

Much of the collection of materials for research into the nature and possibilities of Indian Fisheries can only be collected by the administrative staff. Even this has become possible on any extensive scale since the transfer of the fish-curing yards to the Department. The material thus collected can, however, only be turned to account either at headquarters or in one of the research stations.

Biological research in connection with fish or other organisms of importance in fishery work must, to some extent at least and often almost exclusively, be done in the natural habitat of the organisms concerned. On the other hand it cannot be done without special laboratories, as these alone can provide all the necessary equipment. And such laboratories cannot be had in a day, even if it were ever financially practicable to establish them in a large number of places. The result has been that till recently the Department has pursued a number of lines of research in various localities, but has, as a rule, been unable to press them far beyond the point when laboratory equipment becomes essential to further progress.

To meet the need thus indicated, two special laboratories, in addition to the older one at West Hill, Calicut, are now being

developed, viz., one at sea on the Steam Trawler "Lady Goschen" for marine work generally, and another on Krusadai Island in the Gulf of Mannar, chiefly for research in connection with the pearl and chank fisheries.

The laboratories both at West Hill and at Krusadai Island are, however, handicapped in their work by the absence of a well-equipped aquarium. And the Aquarium in Madras is not equipped with either laboratory or staff for biological research.

#### A.—At Sea (Trawler).

The biological research staff on board the Trawler "Lady Goschen" at present consists of a single Inspector only. As there was difficulty in finding a qualified zoologist for this post an experienced member of the Department Mr. M. Ramaswami Nayudu, B.A. (ZOOLOGY), was appointed. He took charge on 21st September 1927. In consideration of the impossibility of his taking his wife and family to live on the trawler with him Government granted him a compensation allowance of Rs. 50 per month.

#### B.—On Shore.

1. WEST HILL RESEARCH STATION, CALICUT.—Mr. S. T. Moses continued to be in charge of the West Hill Research Station till December 1927, when he was transferred to the Research Station on Krusadai Island. Mr. Jayaram Nayudu, B.A., the Second Research Assistant was transferred to Vizagapatam as Inspector of Fisheries when he was succeeded by Mr. E. K. Madavan, B.A. Since the transfer of Mr. Moses to Krusadai Island, Mr. Madavan has been in sole charge of the West Hill Station.

2. KRUSADAI ISLAND RESEARCH STATION.—Mr. S. T. Moses, M.A., as already stated, took charge of this station from January 1928. A sum of Rs. 1,780 was sanctioned for the purchase of apparatus and the construction of an overhead tank, pipe, and a set of table tanks for the laboratory. An additional sum of Rs. 300 was sanctioned for necessary repairs to buildings.

Much still remains to be done in developing this new station, including the provision of an Aquarium in connection with this which it has been proposed to establish at Rameswaram as it is clear that the cost of maintaining it could be fully met by gate money in view of the large number of pilgrims who visit there. Proposals were submitted for the inclusion of the scheme in Part II of the budget for 1928-29, but Government have ordered that it should be deferred for the present.

3. MADRAS AQUARIUM.—The Aquarium continued to be in charge of the Laboratory Assistant, Mr. M. K. Giriappa. There were no changes in the staff during the year.

4. PROPOSED RESEARCH STATION AND AQUARIUM AT VIZAGAPATAM.—The question of a suitable site has, after a prolonged correspondence with the local municipal authorities and the Collector extending over three years (1925—28) has been solved by the Department acquiring a plot of ground of about an acre and a half on the foreshore. The scheme can now therefore be expected to materialise in the near future.

#### C.—Inland.

HILSA INVESTIGATION.—Experiments in the hatching of Hilsa are greatly hampered for want of adequate laboratory facilities. The preliminary experiments were made in the P.W.D. lock bungalow at Bezwada, where the office of the Assistant Industrial Engineer was located. As a fully equipped hatchery is necessary, before experiments in transferring the fry to the Collair lake and rearing them there can be started, Government were asked to reserve the lock bungalow at Bezwada since fallen vacant for the hatchery. Government, however, ordered that as this could not be done, proposals for locating the hatchery in a portion of the P.W.D. land adjoining the lock bungalow might be submitted in consultation with the P.W.D. The Executive Engineer, Kistna Central Division, has since reported that, till the lock bungalow is actually occupied by the Police Department for whom it is intended, the hatchery may continue there. It is improbable that any further progress or any practical use of the work already done can be made until a permanent hatchery can be installed.

## 2. TECHNOLOGICAL.

### A.—Tanur Experimental Station.

The present staff of the Tanur Station consists of one Research Assistant, one clerk and one mechanic. As there are several new lines of technological research to be investigated, the appointment of a Fisheries Chemist and a Commercial Engineer is a necessity.

### B.—Chaliyam Cannery.

Till the 1st week of May 1927, the Superintendent, Mr. T. P. Bharatan was away at Tuticorin on special duty in connection with pearl fishery. During this period, the Personal Assistant to the Director of Fisheries was in charge of the work of the

Superintendent in addition to his own duties. On return from special duty Mr. Bharatan was appointed as Inspector of Fisheries, Nilgiris, in addition to retaining charge of the Cannery. He reverted as Superintendent of the Cannery on 12th March 1928 and continued till 28th May when the post of the Superintendent was abolished, and he was appointed Acting Inspector of Fisheries (Inland).

### 3. EDUCATIONAL.

*Government Fisheries Training Institute.*—From 22nd July to 15th September 1927, the Headmaster was engaged in the Director's office at Madras in revising the syllabus in Fishery Technique. From 14th May to 21st June 1928 the Headmaster was on sick leave. During these periods no substitute was appointed, but the work was distributed among his assistants.

The shed for the model school, the building of which was sanctioned by the Government towards the end of last year, has been erected in the Institute compound. This necessitated the pulling down of a small thatched house which had been used as the net room. The nets are now kept in the small room intended for the students' reading room. Proposals are under consideration for extending the existing scout room by the addition of a store room and a net room. The building of a hostel, the acquisition of a playground and the construction of a tank in the Fisheries Training Institute compound are among the other additions required.

The Institute library was extended by the addition of 119 books (22 English and 97 Malayalam). The apparatus purchased during the year include a cast net, a photographic camera and four glass aquaria.

### 4. STEAM AND MOTOR VESSELS.

*"Lady Goschen."*—At the beginning of the year the trawler had only a skeleton crew. As it was considered necessary that the drivers engaged should possess certificates of qualification for the post, Captain Cribb was deputed to Bombay from 2nd September to 9th September 1927 to recruit suitable men for the engine room, as none were available at Madras. But these men were soon found unsuitable for the arduous work on board the trawler and they were discharged on 14th October 1927 and new ones were recruited from Tuticorin on 20th October 1927. In the meanwhile, when the trawler was lying at anchor at Madras, certain minor repairs to the



engine parts were done by Messrs. Binny & Co., and a set of new otter boards were made at the Industrial Workshop as the ones brought by the vessel were found unsuitable.

The stock of nets and gear brought with the vessel for trawling and fishing experiments became worn out with use. An indent therefor for those urgently required was sent in December 1927 to the Director-General of Stores, London, for very early compliance. They have since arrived.

The trawler was laid up in the Madras Harbour from May to 13th September 1927. The vessel was brought to Madras to carry on deep-sea fishing experiments, and to attend to the question of alterations and additions of cabins and a laboratory on board. No fishing experiments, however, could be undertaken, till 14th September, as most of the crew resigned soon after the vessel arrived at Madras and as there was difficulty in securing the services of suitable men. From 14th to 25th September the trawler did half a dozen experimental fishing cruises off Madras, but these had to be closed as the engine room crew were unable to raise sufficient steam pressure to work the trawl nets. Between 26th September to 14th October, the trawler was slipped at Madras, and minor repairs to the engine were carried out at Binny's workshop, as already stated. The trawler left for Tuticorin on the 22nd October 1927.

From 31st October 1927 to 10th March 1928, the trawler was engaged in salt transport and in exploring the trawl grounds off Tuticorin and Cape Comorin. She has also been engaged in the dredging of pearl banks as directed in G.O. No. 76, Routine, Development, dated 7th March 1928. Since Government decided to send the trawler to Royal Indian Marine Dockyard, Bombay, with a view to obtaining an estimate from the dockyard for the proposed alterations and additions, she left for Bombay in the last week of June 1928 arriving there on the 30th June 1928.

"*Lady Nicholson*."—She was used for inspection of pearl banks and as a flag ship during the pearl fisheries. She was also utilized as a tug in two pearl fisheries, whenever calms and head winds prevailed. The charges of upkeep during the season came to Rs. 10,964-9-11 against Rs. 7,478 in 1926-27 and Rs. 12,487 in 1925-26.

The water circulation was found defective in one of the engines causing cracking of the cylinders. New parts were therefore obtained from the makers and have been fitted in. They have not

yet been tried sufficiently long to test their efficiency; if found satisfactory the second engine may be provided with similar parts.

The Port Officer, Tuticorin, after a careful inspection of the vessel during the year, reports that she is good for another 20 years and that her present value may be estimated at Rs. 50,000.

"*Leverett*."—She was used in the Rāmnād chank fisheries and for the pearl fisheries for towing the boats. The cost of her upkeep was Rs. 4,976-10-4 against Rs. 4,056 in 1926-27 and Rs. 5,282 in 1925-26. She was in active commission for 198 days. The local Port Officer who inspected the vessel estimated the present value as Rs. 4,000 and that she is likely to be of service for another five years.

"*Sea Scout*."—It was originally intended to dispose of this vessel, but as there were no offers, she was retained with a skeleton crew, and used during the pearl fisheries. During the present season, she was engaged in both the pearl and chank fisheries. Her charges of upkeep amounted to Rs. 3,536-10-0 against Rs. 796 during 1926-27 and Rs. 1,277-6-8 in 1925-26. She is at present valued at Rs. 20,000 and she is expected to serve for another 10 years. She is quite a suitable vessel for the Tuticorin chank fisheries and may replace "*Sutherland*."

"*Sutherland*."—She has been completely disabled during the year, as her engine broke down. Her crew worked on board the "*Sea Scout*" most of the time. Her upkeep cost the Department Rs. 1,118-14-11, of which Rs. 736 represent pay of the crew against Rs. 2,763 in 1926-27 and Rs. 4,228 in 1925-26.

"*Pearl*."—She was solely employed in the Rāmnād chank fisheries. Her engine has deteriorated badly and it is not possible to obtain spare parts as the pattern has become obsolete. Her upkeep cost the Department Rs. 2,462-8-6 during the year against Rs. 1,680 in 1926-27 and Rs. 2,360 in 1925-26. She was in active commission for 101 days.

## 5. ADMINISTRATIVE.

A list of the Gazetted staff of the Department is given in Appendix I.

### A.—Director's Office.

*Director*.—In G.O. Miscellaneous No. 1023, Development, dated 16th June 1928, Dr. B. Sundara Raj was sent on deputation to Bihar and Orissa for a period of three weeks from 8th June 1928 in

connexion with the inspection of fisheries in the Chilka Lake. He was granted 8 months' leave out of India, from the date of the termination of the deputation, and Dr. F. H. Gravely, Superintendent, Government Museum, Madras, was appointed to be in full charge of the post of the Director of Fisheries in addition to his own duties, during the period.

*Personal Assistant.*—Dr. D. W. Devanesan continued as Personal Assistant except for short periods on two occasions when he was appointed to act as Assistant Director of Fisheries (Inland), Madras, and Assistant Director of Fisheries (Coast), Calicut. During these periods Mr. C. R. Natesa Pillai, the Head Accountant of the Director's Office, acted as Personal Assistant. There was no other change in the staff.

#### B.—West Coast.

*Assistant Director.*—M.R.Ry. U. Karunakara Menon Avargal, B.A., continued as Assistant Director of Fisheries, Calicut, from the beginning of the year till 23rd April 1928, when he went on leave for 2 months and 8 days. During this period Mr. A. K. Krishnan, the Senior Inspector of Fisheries under him was in additional charge of his duties for one month and 14 days, after which Dr. D. W. Devanesan, M.A., Ph.D., Personal Assistant to the Director, was appointed to act.

*Inspectors.*—Mr. A. K. Krishnan was in charge of the Calicut section except for a short interval from 28th October to 31st December 1927 when he was partly on deputation to Madras to prepare a note on fisheries for the Royal Commission on Agriculture and partly on leave. During this period Mr. A. K. Gopalan Nayar acted for him.

Messrs. U. Nagappa and K. Ambadi were in charge of the Mangalore and Ponnāni sections, respectively, during the whole period.

*Fish-curing yards.*—There were 57 fish-curing yards on the West Coast, 26 of which were under the charge of Sub-Inspectors, one in charge of a Sub-Inspector for the fishing season and of a petty yard officer during the monsoon months, seven in charge of peons and the rest in charge of petty yard officers.

The proposals for the conversion of temporary thatched sheds into masonry buildings have not yet been sanctioned by Government. Government have accepted the proposal for the construction of additional store sheds in certain fish-curing yards and sanctioned the construction of a few during the current financial year. But as

they have imposed a condition that the cost of such sheds should be recovered from the curers, the sanction has not yet been given effect to. Lack of adequate storage space has caused much loss and inconvenience to the curers. Although the existing salt store-sheds had been fully stocked at the end of the transport season 1926-27, the supplies ran out before further salt could be obtained from the East Coast owing to unexpectedly heavy catches of fish. Consequently, duty-paid bazaar salt had to be purchased by the curers of some of the yards. In other places, as an alternative, mackerel was beach-dried and sold as manure. The only remedy to prevent salt depletion is to provide in each yard sufficient stock of salt to meet a year's requirements and to collect at each of the section headquarters a large reserve stock of salt for emergencies. There are such reserve store-houses at present at Calicut and Ponnāni. If one is established at Mangalore as well, the danger of salt shortage will be minimised.

#### C.—East Coast (South).

*Superintendent, Pearl and Chank Fisheries.*—M.R.Ry. Rao Bahadur J. A. Fernandez Avargal, continued to be the Superintendent, Pearl and Chank Fisheries, Tuticorin.

*Inspector.*—In G.O. Miscellaneous No. 61, Development, dated 31st March 1928, the Government were pleased to sanction the post of a temporary Inspector of Pearl and Chank Fisheries to relieve the Superintendent of his technical duties. Mr. A. Somayaji was appointed to the post.

*Fish-curing yards.*—Of the 14 fish-curing yards in charge of the Superintendent, 11 are in charge of petty yard officers and the rest in charge of peons.

#### D.—East Coast (North).

*Inspector.*—On the transfer of Mr. M. Ramaswami Nayudu as Inspector of Fisheries (Marine), Mr. M. Jayaram Nayudu who was then working as Second Research Assistant in the West Hill Research Station, Calicut, was appointed as Inspector of Fisheries, Vizagapatam section. He took charge on 15th August 1927 and continued throughout the year.

*Office accommodation.*—The present office building is too narrow and could not accommodate even the small establishment until recently existing. With the sanction of an additional clerk, the difficulty of accommodation has become keener. The difficulty

will, however, be overcome when the office is shifted to the Office of the District Registrar, Vizagapatam, which has been procured for the purpose.

*Fish-curing yards.*—There are 30 fish-curing yards, of which three are under petty yard officers, the rest are in charge of peons.

#### E.—East Coast (Central).

*Assistant Director.*—M.R.Ry. C. G. Chakrapani Ayyangar Avargal, B.A., continued as Assistant Director of Fisheries (Inland) the whole of the year except for a short period from 1st July 1927 to 5th August 1928, when he was on leave. During this period Dr. D. W. Devanesan, the Personal Assistant to the Director of Fisheries, acted for him.

*Inspectors.*—Mr. K. Unni Nayar, Inspector of Fisheries (Inland), was on three months' leave from 28th of May 1928 and Mr. T. P. Bharatan whose appointment as Temporary Superintendent of the Cannery ceased to exist, was posted to act as Inspector of Fisheries (Inland) for the period.

The Inspector of Fisheries, Nilgiris, Mr. T. R. Lakshmana Ayyar, was on leave till March 1928, and Mr. T. P. Bharatan, the temporary Superintendent of the Cannery, was appointed to act during this period. Mr. Lakshmana Ayyar was in charge from March till end of the year.

*Fish farms.*—None of the farms suffered for want of water during the year. Some of the ponds of the Mopad farm and the Praema farm have been brought into working order and stocked with gourami and etroplus.

*Sunkesula.*—Owing to the satisfactory breeding of gourami, most of the limited space available is occupied by this fish, leaving a little room for etroplus and others. The Praema and Mopad fish farms, which are being brought into working order, will, it is hoped, shortly relieve this congestion. The pumping engine having become old Government, in G.O. Miscellaneous No. 464, Development, dated 13th March 1928, sanctioned an oil engine at an aggregate cost of Rs. 4,500.

*Praema.*—The new farm at Praema was brought into working order during the year and two ponds have been stocked with gourami with satisfactory results. When gourami was first put in the new ponds in January last there were some casualties. The water was sent to the King's Institute for analysis to find out the cause; a large quantity of sulphuretted hydrogen was found to be

present in the sample. To eliminate this undesirable gas, the supply channel and the margins of ponds were planted with the water weed "Vallisneria." The result was entirely satisfactory and the subsequent consignment of gourami sent in March last are not only thriving well, but have begun to breed. When compared with Sunkesula, this locality appears to be very favourable for gourami, both on account of the coolness of the spring-water even during the hot weather and the comparatively low temperature resulting from the shade afforded by the forest. Arrangements are being made to stock all the ponds fully with gourami.

Two ponds which were originally intended for larvicidal fish will be stocked with tench and English carp, as this locality appears to be more suitable for these fish than Sunkesula.

Recently objections were raised by the ryots of the adjacent villages, Kadamalakalva, to the diversion of Bhiravani spring-water to the fish ponds, on the ground that the wet ayacut area under the spring suffers for want of water. The matter was fully investigated with the aid of the Revenue Officers and it was found that there was not much force in the objection. The period when the ryots will be requiring water for these lands lasts only from the end of July to October. This is the rainy season in these parts, the ponds will not be requiring much water then and the ryots' interest need not suffer. Since, however, we have had no actual experience in the matter, the question of water-supply will carefully be studied during the ensuing wet weather and remedial measures, if they prove to be necessary, will be suggested later.

*Ippur.*—The disastrous cyclone which passed over the Nellore District during November last damaged the farm buildings considerably. All the buildings including the hatchery with zinc sheet roofs were rendered roofless. Fortunately there was no loss of life. The value of the property damaged in the farm was Rs. 1,500 and the cost of reconstructing them came to Rs. 474. The work of restoration is now in progress.

The other buildings in the several stocking centres of the Nellore District which are indirectly connected with the farm also suffered badly. The store-shed in Nellore town and at Sangam suffered partially. The Nellore store-shed will be rebuilt shortly. The other buildings were repaired soon after the storm at a total cost of Rs. 311. The amount written off by Government under G.O. Miscellaneous No. 118, Development, dated 23rd January 1928, on account of storm damage is Rs. 4,227.

*Perambur.*—The question of shifting the farm to the Government Brickfields at Chetput was finally decided and Government in G.O. Miscellaneous No. 1731, Development, dated 28th October 1927, approved of the transfer. Plans and estimates for remodelling the pits in the brickfield into convenient fish ponds were submitted to Government. Final orders have not yet been received.

*Vellore Fort Moat.*—During the year under report there was no water scarcity, and the northern section which contains marketable fish, including catla, and the western section in which gourami are kept, both had a good supply.

*Mopad.*—The ponds in this farm are in two blocks, one consisting of 11 ponds and another of 7.

It was possible to bring into working order this year only six ponds, one of which is stocked with gourami and the others with etroplus. The remaining ponds will shortly be brought into working order after the repairs are over.

The cyclone had its effects here; but fortunately there were only slight damages to the watchman's quarters and store-sheds which were immediately repaired at a cost of Rs. 423. The want of a masonry building to accommodate the office and stores is greatly felt. The present buildings are thatched ones with no proper flooring and things kept in them are frequently attacked by white ants.

*Chingleput Fort Moat.*—The work of remedying the defects in the construction of this farm is at a standstill, owing to the notice given by the ryots objecting to certain items of repair, notably the loose stone wall in front of the head-sluice on the ground that it would interfere with the water-supply to their wet lands. The Public Works Department authorities have not yet decided as to what should be done. It is hoped that the Public Works Department authorities will come to a decision at an early date and carry out repairs.

*Fish-curing yards.*—There were ten yards in charge of the Assistant Director (Inland), of which two were in charge of petty yard officers, while the rest were in charge of peons.

I have the honour to be,

Sir,

Your most obedient servant,

F. H. GRAVELY,

*Director of Fisheries (in charge).*

## APPENDIX I.

## Staff of the Fisheries Department.

Post	Incumbent.	Period.
Director	Dr. B. Sundara Raj	1st July 1927 to 7th June 1928.
Assistant Director (Marine).	Dr. F. H. Gravelly	8th to 30th June 1928.
	Captain T. G. Cribb	1st July 1927 to 30th June 1928.
Assistant Director (Coast)...	M.R.Ry. U. Karunakara Menon Avargal.	1st July 1927 to 22nd April 1928.
	M.R.Ry. A. K. Krishnan	23rd April to 5th June 1928 (in charge of current duties).
Assistant Director (Inland).	Dr. D. W. Devanesan	6th to 30th June 1928.
	Do.	1st July to 5th August 1927.
Superintendent, Pearl and Chank Fisheries.	M.R.Ry. C. G. Chakrapani Ayyangar Avargal.	6th August 1927 to 30th June 1928.
	M.R.Ry. Rao Bahadur J. A. Fernandez Avargal.	1st July 1927 to 30th June 1928.

## APPENDIX II—FINANCIAL STATEMENTS.

## STATEMENT I.—Summary of Expenditure and Revenue of the Fisheries Department for 1927–28.

Particulars.	Expenditure.		Revenue.		Difference.	
	RS.	A. P.	RS.	A. P.	RS.	A. P.
I. Direction	35,614	0 8	0	12 0	—35,613	4 8
II. Superintendent, Pearl and Chank Fisheries	1,15,389	5 2	4,90,149	5 4	3,74,760	0 2
III. Assistant Director (Marine)	83,154	14 0	195	5 0	—82,959	9 0
IV. Assistant Director (Coast)	9,061	10 10	180	0 0	—8,881	10 10
V. Church Island Fish curing Station	1,903	14 5	90	13 6	—1,813	0 11
VI. Tanur Station	13,197	10 7	13,428	15 2	231	4 7
VII. Fisheries Training Institute	17,799	13 11	238	8 0	—17,561	5 11
VIII. Schools for fishermen	42,884	14 6	24	6 0	—42,860	8 6
IX. Assistant Director (Inland)	1,14,205	5 10	1,01,257	2 3	—12,948	3 7
Nilgiri fisheries	6,100	4 2	1,042	4 6	—5,057	15 8
X. Oyster Farm, Pulicat	3,502	13 3	2,239	5 0	—1,263	8 3
XI. Aquarium	6,468	1 11	9,579	9 6	3,111	7 7
XII. Marine Biological Section—Zoological Supply Section	5,099	4 5	5,105	15 0	6	10 7
Research Section, Calicut	5,971	7 2	2	8 0	—5,968	15 2
Research Section, Krusadai Island	6,507	10 3	37	11 0	—6,469	15 3
XIII. Fish curing yards	4,56,050	5 1	4,40,393	1 3	—15,657	3 10
Cannery (1st April 1927 to 31st March 1928)	59,771	4 5	17,886	6 2	—41,884	14 3
Total	9,82,682	12 7	10,81,851	15 8	99,169	3 1



APPENDIX II—cont.

STATEMENT 2.—Details of Expenditure.

Particulars.	Salaries.			Establishment.			Allowances.			Supplies and Services.			Contingencies.			Total.					
	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.			
i. Direction ... ..	(1)	9,681	12	0	12,809	5	0	(2)	5,711	15	8	...	7,411	0	0	35,614	0	8			
ii. Superintendent, Pearl and Chank Fisheries ... ..	(3)	3,250	11	9	(4)	20,062	10	11	(5)	1,465	7	10	87,673	0	2	2,937	6	6	1,15,389	5	2
iii. Assistant Director (Marine) ...		9,730	10	0		13,009	4	0		4,247	8	0	54,940	2	0	1,227	6	0	83,154	14	0
iv. Do. (Coast) ... ..	(6)	3,409	7	10		1,970	4	0		2,149	9	0	...			1,532	6	0	9,061	10	10
v. Church Island Fish-curing Station ... ..		...				182	7	0		53	3	0	1,376	5	7	291	14	10	1,903	14	5
vi. Tanur Station ... ..	(7)	487	1	2		1,175	11	6		117	13	0	10,512	6	2	904	10	9	13,197	10	7
vii. Fisheries Training Institute ...		...				6,118	1	0		651	13	0	6,190	4	3	4,839	11	8	17,799	13	11
viii. Schools for Fishermen ... ..		...				29,110	8	0		456	4	0	842	1	0	12,476	1	6	42,884	14	6
ix. Assistant Director (Inland) ...		4,315	5	0		12,246	14	0		8,873	7	0	87,080	1	5	1,689	10	5	1,14,205	5	10
Nilgiri Fisheries ... ..		...				3,213	0	0		1,567	6	0	...			1,319	14	2	6,100	4	2
x. Oyster Farm ... ..		...			(8)	254	12	0		...			2,263	1	9	984	15	6	3,502	13	3
xi. Aquarium ... ..		...				2,288	12	0		3	10	0	1,542	15	6	2,632	12	5	6,468	1	11
xii. Marine Biological Section—Zoo- logical Supply Section, Ennur.		...			(9)	3,250	10	0		132	5	0	1,163	13	0	552	8	5	5,099	4	5
Research Section, Calicut ... ..		...			(10)	4,959	10	0		118	1	0	314	15	9	578	12	5	5,971	7	2
Research Section, Krusadai Island ... ..		...				1,507	4	0		416	6	0	4,261	0	3	323	0	0	6,507	10	3
xiii. Fish-curing yards ... ..	(11)	1,000	13	3	(12)	90,026	4	1	(13)	12,589	5	6	2,89,886	0	4	62,597	13	11	4,56,050	5	1
Cannery (for year ending 31st March 1928).		...			(14)	1,249	1	0		155	4	0	57,299	10	10	1,067	4	7	59,771	4	5
Total ... ..		31,875	13	0		2,03,434	6	6		38,709	6	0	6,05,295	14	0	1,03,367	5	1	9,82,682	12	7

FISHERIES DEPARTMENT

- (1) Excludes Rs. 248-4-0 being 2½ per cent of the salary of the Director debited to Pearl Fisheries.  
 (2) Excludes Rs. 100-12-4 being 2½ per cent of the travelling allowance of the Director debited to Pearl Fisheries.  
 (3) Includes Rs. 248-4-0 being 2½ per cent of the salary of the Director and excludes Rs. 1,000-13-3, 25 per cent of the salary of the Superintendent, Pearl and Chank Fisheries, debited to Fish-curing yards.  
 (4) Includes Rs. 994-0-11 being leave and pensionary contribution of the permanent staff.  
 (5) Includes Rs. 100-12-4 being 2½ per cent of the travelling allowance of the Director and excludes Rs. 133-5-6 being 25 per cent of the travelling allowance of the Superintendent, Pearl and Chank Fisheries.  
 (6) Excludes 12½ per cent of the salary of the Assistant Director (Coast) debited to Tanur Station.

- (7) Represents 12½ per cent of the salary of the Assistant Director (Coast).  
 (8) Represents 25 per cent of the pay of the Laboratory Assistant, Ennur.  
 (9) Excludes 25 per cent of the pay of the Laboratory Assistant, Ennur, debited to Oyster Farm.  
 (10) Includes 50 per cent of the pay of the Tanur Establishment and 50 per cent of the pay of the Inspector of Fisheries, Vizagapatam.  
 (11) Represents 25 per cent of the pay of the Superintendent, Pearl and Chank Fisheries.  
 (12) Excludes 50 per cent of the pay of the Inspector of Fisheries, Vizagapatam, debited to Research but includes Rs. 7,479-14-7 for pensionary contribution in respect of permanent establishment.  
 (13) Includes 25 per cent of the travelling allowance of the Superintendent, Pearl and Chank Fisheries.  
 (14) Includes Rs. 207 being leave and pensionary contribution.

APPENDIX II—cont.

STATEMENT 3.—Details of Supplies and Services.

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ADMINISTRATION REPORT OF THE

(ii) Superintendent, Pearl and Chank Fisheries—	Amount.		
	RS.	A.	P.
A. Chank fisheries—			
(1) Rāmnāil chank fisheries ... ..	26,833	11	1
(2) Tinnevely chank fisheries ... ..	13,153	9	6
(3) Sivaganga fisheries ... ..	332	15	1
(4) Leased fisheries ... ..	41	0	0
B. Pearl fisheries—			
(1) Pearl fishery works ... ..	219	0	10
(2) Pearl fishery running charges ... ..	28,562	8	6
(3) Examination of pearl banks ... ..	2,020	13	6
(4) Pamban pearl farm ... ..	929	8	0
C. Fisheries vessels—			
(1) "Lady Nicholson" ... ..	6,177	4	11
(2) "Sutherland" ... ..	382	2	11
(3) "Leverett" ... ..	3,628	8	4
(4) "Pearl" ... ..	1,641	0	6
(5) "Sea Scout" ... ..	3,393	11	0
(6) Bonus to crew of fishery vessels ... ..	357	2	0
	<u>87,673</u>	<u>0</u>	<u>2</u>
(iii) Assistant Director (Marine)—			
Apparatus and materials ... ..	2,797	10	0
Coal oil and fuel ... ..	20,711	0	0
Provision allowance ... ..	4,586	11	9
Deck stores ... ..	6,596	6	3
Engine stores ... ..	966	13	1
Water ... ..	1,181	2	6
Repairs ... ..	13,387	4	0
Pilotage ... ..	620	6	8
Miscellaneous ... ..	2,613	3	9
Customs duty ... ..	1,479	8	0
	<u>54,940</u>	<u>2</u>	<u>0</u>

(ix) Assistant Director (Inland)—	Amount.		
	RS.	A.	P.
A. Tank stocking—			
(1) Compensation to District Boards ... ..	68,188	10	0
(2) Stocking of tanks ... ..	1,949	8	5
(3) Chingleput tank stocking scheme ... ..	798	9	6
(4) Nellore tank stocking scheme ... ..	1,211	8	3
B. Other works—			
(1) Sunkesula fish farm ... ..	4,554	2	6
(2) Ippur fish farm ... ..	1,978	0	11
(3) Powder Factory fish farm ... ..	1,132	7	9
(4) Chingleput Fort moat fish farm ... ..	535	10	3
(5) Vellore Fort moat fish farm ... ..	662	4	8
(6) Mopad fish farm ... ..	3,972	5	5
(7) House boat maintenance ... ..	1,157	1	8
(8) Nallamalais scheme ... ..	939	12	1
	<u>87,080</u>	<u>1</u>	<u>5</u>
(xiii) Fish-curing yards—			
Purchase of salt ... ..	30,149	7	4
Charges for conveyance of salt ... ..	74,207	15	5
Export and import of salt ... ..	87,779	10	8
Other contingencies ... ..	43,046	15	2
Clothing and equipment ... ..	2,636	4	9
Opening stock of salt on hand on 1st July 1927.	95,062	10	2
	<u>3,32,882</u>	<u>15</u>	<u>6</u>

APPENDIX II--cont.

STATEMENT 4.—Details of Revenue.


Sub-head.	Amount. RS. A. P.
(i) Direction— Miscellaneous receipts ... ..	0 12 0
(ii) Superintendent, Pearl and Chank Fisheries—	
(1) Revenue from all chank fisheries including Beche-de-mer fishery as per Statement No. 5, Appendix II ... ..	85,919 9 4
(2) Revenue from Pearl fishery section as per Statement No. 6, Appendix II ... ..	4,00,175 12 0
(3) Revenue from lease of right of fishing in salt factory channels ... ..	4,054 0 0
	4,90,149 5 4
(iii) Assistant Director (Marine)—	
Deep sea fishing receipts ... ..	151 5 0
Miscellaneous receipts ... ..	44 0 0
	195 5 0
(iv) Assistant Director (Coast)— Miscellaneous receipts ... ..	180 0 0
(v) Church Island fish-curing station— Sale-proceeds of cured fish, fins and fish-oil ...	90 13 6
(vii) Fisheries Training Institute— Miscellaneous receipts ... ..	238 8 0
(viii) Schools for fishermen— Miscellaneous receipts ... ..	24 6 0
(ix) Assistant Director (Inland)—	
(1) Rentals from Cauvery, Coleroon, tanks and canals ... ..	73,818 9 8
(2) Rentals from the tanks in the Chingleput district ... ..	6,564 6 4
(3) Rentals from the tanks in the Nellore district.	9,312 14 6

Sub-head.	Amount. RS. A. P.
(ix) Assistant Director (Inland)—cont.	
(4) Rentals from tanks and canals in other districts.	8,246 2 8
(5) Receipts from fish farms by sale of fish and grass and miscellaneous receipts including rent of buildings ... ..	3,315 1 1
	1,01,257 2 3
(x) Pulicat Oyster Farm—	
Sale of oysters ... ..	2,155 1 0
Oyster shell grit ... ..	84 4 0
	2,239 5 0
(xi) Aquarium—	
(1) Gate collections ... ..	8,812 11 6
(2) Sale-proceeds of guides, picture post-cards, etc.	219 4 0
(3) Sale-proceeds of turtles ... ..	25 10 0
(4) Aquarium shop rental ... ..	522 0 0
	9,579 9 6
(xii) Marine Biological Section—	
Sale of zoological specimens ... ..	5,045 15 0
Rent recovered from the Research Assistant for occupation of Ennur bungalow ... ..	60 0 0
	5,105 15 0
Research Station, West Hill—	
Miscellaneous receipts ... ..	2 8 0
Research Station— Krusadai Island ... ..	37 11 0

## APPENDIX II—cont.

STATEMENT 5.—Expenditure and Revenue Account of the Chank and Beche-de-mer Fisheries for the season 1927-28.

Expenditure.	Amount.			Revenue.	Amount.		
	RS.	A.	P.		RS.	A.	P.
Chank Fisheries—				By value of Chanks			
Tinnevelly ... ..	13,528	10	7	fished—			
Rāmnād ... ..	28,053	15	10	Tinnevelly ... ..	36,627	1	6
Sivaganga ... ..	332	15	1	Rāmnād ... ..	42,353	12	0
Lease 1 chank fisheries...	41	0	0	Sivaganga ... ..	516	9	6
Beche-de-mer fishery ..	968	15	7	Beche-de-mer fishery.	...		
Fifteenth year's pro-				„ Chank rentals real-			
portion of the total				ized—			
consideration paid in				Tanjore district ...	3,710	0	0
1913-14 for a 15 years'				South Arcot dis-	1,670	0	0
lease of the Rāmnād				Chingleput and			
Chank Fishery ...	4,000	0	0	Nellore dis-	1,003	5	4
Leave and pensionary				Miscellaneous re-			
contribution of perma-				ceipts ... ..	33	13	0
nent staff ... ..	456	13	6				
Interest on capital							
outlay ... ..	1,335	7	7				
Depreciation on fixed							
assets ... ..	4,127	0	0				
Supervision charges—							
50 per cent of the pay							
and travelling allow-							
ance of the Superin-							
tendent, Pearl and							
Chank Fisheries ...	2,268	5	6				
Direction charges ...	...						
	55,113	3	8				
Less value of stock of							
Beche-de-mer carried							
over ... ..	968	15	7				
	54,144	4	1				
Balance ... ..	31,775	5	3				
Total ... ..	85,919	9	4	Total ... ..	85,919	9	4



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APPENDIX II—*cont.*  
STATEMENT NO. 6.



Other contingencies (ii) Superintendence ... ..	...	1,437	6	6
Honoraria to the crew of Fisheries vessels ... ..	...	357	2	0
Interest on Capital outlay .. ..	...	11,323	4	7
Depreciation on fixed assets ... ..	...	6,848	0	0
Supervision charges—25 per cent of the pay and travelling allowance of the Superintendent, Pearl and Chank Fisheries ... ..	...	1,134	2	9
Direction charges—2½ per cent of the pay and travelling allowance of the Director of Fisheries, Madras ... ..	...	358	0	4
Pay of temporary establishment, Sanitary, November 1927 pearl fishery ... ..	158	14	0	
Travelling allowance of temporary establishment, Sanitary, November 1927 pearl fishery ... ..	17	1	0	
Pay and travelling allowance of sanitary establishment, March-April 1928 pearl fishery ... ..	169	9	0	
Pay and travelling allowance of the Police staff, November 1927 pearl fishery ... ..	1,747	2	0	
Pay and travelling allowance of the Police staff, March-April 1928 pearl fishery ... ..	1,290	0	0	
Contribution paid to the local Municipality during November 1927 pearl fishery (sanctioned in G.O. No. 2153, Development, dated 15th December 1927) ... ..	221	12	0	
		<u>3,604</u>	<u>6</u>	<u>0</u>
		63,139	15	7
Less value of expendible stores on hand ... ..	...	1,894	14	6
		61,245	1	1
Net profit ... ..	...	3,38,930	10	11
		<u>4,00,175</u>	<u>12</u>	<u>0</u>

APPENDIX II—cont.

STATEMENT 7.—Trading Account of the Tanūr Experimental Station for 1927-28.

Particulars.	Amount.			Amount.		
	RS.	A.	P.	RS.	A.	P.
To stock—30th June 1927.						
Cured fish ... ..	1,319	11	6			
Fish meal ... ..	74	6	0			
Fish-oil and guano ... ..	182	0	0			
				1,576	1	6
Service stamps ... ..				71	3	6
Purchases—						
Boats and nets ... ..	52	13	0			
Service stamps ... ..	300	0	0			
				352	13	0
Manufacturing cost from manufacturing account ... ..				10,621	10	10
Profit and Loss account (Gross profit).				1,742	12	0
				14,364	8	10

Particulars.	Amount.			Amount.		
	RS.	A.	P.	RS.	A.	P.
By sales—						
Cured fish ... ..	4,501	12	11			
Fish meal ... ..	1,942	1	0			
Fish-oil ... ..	3,892	11	3			
Fish manure ... ..	386	1	1			
						10,722 10 3
Stock (30th June 1928) —						
Cured fish ... ..	960	4	7			
Fish meal ... ..	2,587	13	4			
Fish-oil and guano ... ..	53	10	8			
						3,601 12 7
Service stamps ... ..						40 2 0
						14,364 8 10





APPENDIX II—cont.

STATEMENT 9.—Statement showing the Operations of the Fish-curing yards of the Madras Presidency with Expenditure and Revenue for the year ending 30th June 1928.

Division.	Districts.	Particulars of operations.						Revenue.		
		Number of applications for salt.	Weight of fish brought to be cured.	Weight of salt issued.	Value of salt issued.	Quantity of salt issued to each maund weight of fish.	Weight of cured fish removed.	Actual amount credited into Treasury.	Value of stock on 1st July 1928.	Total revenue.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
East Coast.	Ganjam, Vizagapatam and Godavari, East ... ..	29,254	MDS. SRS. 57,532 19	MDS. SRS. 7,000 30	RS. A. P. 8,750 15 10	LB. 10'01	MDS. SRS. 32,970 35	RS. A. P. 8,815 1 5	RS. A. P. 1,516 2 6	RS. A. P. 10,331 3 11
	Nellore and Chingleput ... ..	7,533	53,924 35	8,607 17	10,759 4 6	12'77	32,782 27	10,794 3 9	863 3 1	11,657 6 10
	Tanjore, Tinnevely and Ramnad ... ..	11,800	80,785 33	15,616 18	19,520 9 0	15'90	56,333 38	19,540 14 4	4,571 6 2	24,112 4 6
	Total, East Coast ... ..	48,587	192,243 7	31,224 25	39,030 13 4	13'38	122,087 20	39,150 3 6	6,950 11 9	46,100 15 3
West Coast.	Malabar and South Kanara ... ..	145,138	1,507,736 0	244,081 1	3,05,101 4 6	13'27	881,039 36	3,11,662 5 4	82,629 12 8	3,94,292 2 0
	Grand total, East and West Coasts ... ..	193,725	1,699,979 7	275,305 26	3,44,132 1 10	13'32	1,003,127 16	(1)3,50,812 8 10	84,580 8 5	4,40,393 1 3

(a) Excludes cess collections of Rs. 4,317-10-7, on the West Coast and Rs. 173-1-9 on the East Coast.

APPENDIX II—cont.

STATEMENT 9.—Statement showing the Operations of the Fish-curing yards of the Madras Presidency with Expenditure and Revenue for the year ending 30th June 1928—cont.

Division.	Districts.	Expenditure.										Difference between columns 11 and 20.	
		Establishment pay, travelling allowance, overtime fees and supervisory charges. (12)	Pensionary contribution for permanent establishment. (13)	Purchase of salt. (14)	Export and import of salt. (15)	Conveyance of salt. (16)	Contingencies. (17)	Clothing and equipment. (18)	Value of salt on hand on 1st July 1928. (19)	Total expenditure. (20)	(21)		
		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
East Coast.	Ganjam, Vizagapatam and Godavari, East ... ..	(a) 16,993 8 6	1,007 0 0	2,860 7 8	...	2,115 10 9	1,830 3 5	(c) 659 1 3	1,220 8 8	26,686 8 3	16,755 4 4		
	Nellore and Chingleput ...	4,785 11 0	284 3 4	2,782 7 0	...	1,580 14 3	1,326 9 6	(c) 329 8 7	543 2 4	11,632 8 0	24 14 10		
	Tanjore, Tinnevely and Ramnad ... ..	(b) 7,712 6 9	698 15 0	2,666 0 8	...	4,741 0 5	1,509 10 4	(c) 329 8 7	3,704 2 0	21,361 11 9	2,750 8 9		
	Total, East Coast ...	29,491 10 3	1,990 2 4	8,308 15 4	...	8,437 9 5	4,666 7 3	1,318 2 5	5,467 13 0	59,680 12 0	13,579 12 9		
West Coast.	Malabar and South Kanara ...	66,644 14 0	5,489 12 3	21,840 8 0	87,779 10 8	65,770 6 0	38,380 7 11	(c) 1,318 2 4	89,594 13 2	3,76,818 10 4	17,473 7 8		
	Grand total, East and West Coasts ... ..	96,136 8 3	7,479 14 7	30,149 7 4	87,779 10 8	74,207 15 5	43,046 15 2	2,636 4 9	95,062 10 2	(d) 4,36,499 6 4	3,893 10 11		

- (a) Excludes Rs. 824-5-6 being 50 per cent of the pay of Inspector, Vizagapatam, debited to "Research."  
 (b) Includes Rs. 1,134-7-9 supervision charges—25 per cent of pay and travelling allowance of the Superintendent, Pearl and Chank Fisheries.  
 (c) Represents proportionate charges for uniform supplied to Petty yard officers and peons.  
 (d) Excludes Rs. 3,105 being expenditure on New Works and Rs. 19,550-14-9 being expenditure on repairs in fish-curing yards.



APPENDIX II—cont.

STATEMENT II.—Government Fisheries Cannery, Chaliyam—Profit and Loss Account for the year ending 31st March 1928.

	Amount.				Amount.			Amount.		
	RS.	A.	P.		RS.	A.	P.	RS.	A.	P.
To loss brought down from										
Part I, Trading account	...	24,172	11 2							
To loss brought down from										
Part II, Trading account	...	660	7 8							
				24,833	2 10					
Repairs to buildings	...	250	8 0							
Tools written off	...	97	6 0							
Stores written off	...	84	6 3							
Empty cans written off	...	481	10 0							
Reserve for raw materials	...	9,903	5 0							
Audit fee, 1927-28	...	250	0 0							
Leave and pension contribution	...	207	0 0							
To depreciation on—										
Buildings	...	567	3 0							
Plant and machinery	...	582	4 2							
Furniture	...	72	0 6							
				1,221	7 8					
Interest on capital	...	4,986	0 0	17,481	10 11					
Grand total	...	42,314	13 9							
By miscellaneous receipts	...	259	7 4							
House rent	...	148	10 2							
								408	1 6	
Interest on depreciation reserve deposited with Government	...							21	14 0	
Loss carried to balance sheet	...							41,884	14 3	
Grand total	...	42,314	13 9					42,314	13 9	

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## APPENDIX III.

Comparative statement of salt transported to West Coast Fish-curing yards from the year 1924 to 1928.

Year.	Total quantity of salt transported.	Quantity by Contractor.	Cost.	Rate per maund.	Quantity by rail.	Cost.	Rate per maund.	Quantity by trawler.	Cost	Rate per maund.
	MDS.	MDS.	RS. A. P.	RS. A. P.	MDS.	RS. A. P.	RS. A. P.	MDS.	RS. A. P.	RS. A. P.
1924-25 ...	168,952	168,952	63,911 15 0	0 6 5·2	10,000	6,510 6 8	0 10 5	Nil.	Nil.	Nil.
1925-26 ...	203,366	180,150	72,435 5 0	0 6 5·2	23,216	15,114 9 4	0 10 5	Nil.	Nil.	Nil.
1926-27 ...	100,352	40,910	16,449 2 0	0 6 5·2	46,414	25,640 15 4	0 8 10	12,998	4,627 12 0	0 5 8·2
1927-28 ...	231,080	21,396	8,604 0 3	0 6 5·2	147,430	77,554 5 2	0 8 5	62,254	22,113 2 2	0 5 8·2

## APPENDIX IV.

## Tanks not leased or leased on special terms.

## 1.—TANKS THAT FETCHED NO RENTALS IN 1927-28.

	Compensation.		
	RS.	A.	P.
<i>Chingleput District—</i>			
Edamanchi ... ..	Nil.		
Oragadam ... ..	2	0	0
Velayar Periyeri ... ..	2	10	7
Govindavadi ... ..	28	12	0
Siruvakkam ... ..	7	0	0
Valattur ... ..	1	12	0
Damal ... ..	6	1	0
Kuram... ..	16	2	0
<i>Nellore District—</i>			
Budamagunta ... ..	15	0	0
Janakiamma ... ..	1	12	0
Nadimi ... ..	0	5	0
Hajipuram ... ..	13	4	0
<i>Kistna District—</i>			
Peddinayadu ... ..	Nil.		
<i>Kurnool District—</i>			
Badaikhan ... ..	16	0	0
Kocheruvu ... ..	Nil.		
Venkatapuram ... ..	Nil.		
<i>Guntur District—</i>			
Dondapad ... ..	Nil.		
<i>Chittoor District—</i>			
Kandukur Vyasasamudram ... ..	Rs. 200 for this and 3 other tanks.		

## 2.—TANKS WHICH FETCHED LOW RENTALS.

	Rentals obtained.			Compensation.		
	RS.	A.	P.	RS.	A.	P.
<i>Nellore District—</i>						
1. Kadivedu ... ..	1	2	0	30	8	0
2. Purini ... ..	28	0	0	147	0	0
3. Zuvaladine ... ..	26	0	0	149	0	0
4. Maripadu ... ..	2	0	0	34	0	0
5. Kanigiri and Duvvur ... ..	1,505	0	0	2,125	0	0
6. Atmakur tank ... ..	110	0	0	202	0	0

## APPENDIX IV—cont.

## Tanks not leased or leased on special terms—cont

## 2.—TANKS WHICH FETCHED LOW RENTALS—cont.

	Rentals obtained.			Compensation.		
	RS.	A.	P.	RS.	A.	P.
<i>Nellore District—</i>						
7. Tadiparti ... ..	2	8	0	22	4	0
8. Bhogavolu tank ... ..	5	0	0	84	0	0
9. Kaudanuthala ... ..	6	4	0	25	0	0
10. Mungammuru ... ..	13	12	0	25	0	0
11. Gavaravaram ... ..	5	0	0	31	0	0
12. Chennayapalem ... ..	40	0	0	97	0	0
13. Mannangidine ... ..	131	0	0	218	0	0
14. Jammulapalem ... ..	2	0	0	32	0	0
15. Zaladanki ... ..	18	0	0	38	0	0
16. Arumakondapalem ... ..	20	0	0	97	4	0
17. Papireddi cheruvu ... ..	40	0	0	122	0	0
18. Kovurupalle tank ... ..	2	0	0	34	0	0
19. Binginipalle ... ..	15	0	0	30	0	0
<i>Chingleput District—</i>						
20. Kondangi tank ... ..	10	0	0	20	0	0
21. Uttiramerur tank... ..	310	0	0	903	0	0
22. Tinnanur tank ... ..	45	0	0	615	0	0
23. Vadamadurai tank ... ..	70	0	0	130	0	0
24. Nayar tank ... ..	10	0	0	150	0	0

## 3.—TANKS THAT WERE DISPOSED OF PRIVATELY FOR FAVOURABLE RENTALS.

Name of tank.	Highest bid in auction.			Amount obtained by private tender or by departmental fishing.			Gain.		
	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.
1. Vaslli ... ..	20	0	0	100	0	0	80	0	0
2. Idimipalli ... ..	20	0	0	50	0	0	30	0	0
3. Indurupeta ... ..	12	4	0	30	0	0	17	12	0
4. Kodur ... ..	460	0	0	621	11	0	161	11	0
				(Departmental fishing.)					
5. Kodavalur ... ..				35	0	0	35	0	0
				(Departmental fishing.)					
6. Allur large and Rammanna tanks.	1,157	0	0	1,205	0	0	48	0	0
7. Mopad tank ... ..	123	0	0	255	0	0	132	0	0
8. Gangapatnam.	55	0	0	70	0	0	15	0	0



## APPENDIX IV—cont.

Tanks not leased or leased on special terms—cont.

## 3.—TANKS THAT WERE DISPOSED OF PRIVATELY FOR FAVOURABLE RENTALS—cont.

Name of tank.	Highest bid in auction.		Amount obtained by private tender or by departmental fishing.		Gain.	
	RS.	A. P.	RS.	A. P.	RS.	A. P.
9. Idagalli ...	3	12 0	35	0 0	31	4 0
			(Departmental fishing.)			
10. Puduparti ...	3	4 0	31	14 6	28	10 6
			(Departmental fishing.)			
11. Kattur ...	14	0 0	21	0 0	7	0 0
12. Perumbedu ...	...		148	0 0	...	

## APPENDIX V.

Inland fisheries leased to fishermen co-operative societies.

Name of society.	Year of formation.	Fishery leased out.	Period.	Annual rental.
1. Hampapuram Fishermen Co-operative Society, Coimbatore district.	1921	Three items relating to the Cauvery in Kollegal taluk.	One year ...	RS. 70
2. Komarapalayam Society, Coimbatore district.	...	Five items relating to "Gobichetti-palayam" taluk.	Three years ending 31st Mar. 1931.	650
3. Sunkesula Society, Kurnool district.	1924	Sunkesula Anicut Fishery, Edurur Swamp Fishery.	Three years ending 31st Mar. 1930.	200
4. Nandyal Society ...	1926	Nandyal Taluk Fishery	One year from 1st Apr. 1928.	515
5. Chidambaram Society, South Arcot district.	1926	Nine items relating to the Lower Anicut System of Fishery.	Three years from 1928 to 1930.	386
6. Udayarkudi and Lalpet Societies.	1926	Two items relating to the Lower Anicut System of Fishery	Two years ending 30th June 1929	1,200
7. Lower Anicut Society, Tanjore district.	1927	(a) One item relating to the Lower Anicut System of Fishery	Three years 1928-30.	271
8. Lower Anicut Society, Tanjore district.	1927	(b) Coleroon river in Kumbakonam.	One year fasli 1337.	4,100
9. Karunthattangudi Society.	1928	Vennar-Vettar Fishery.	Fasli 1338-1340.	5,850
10. Trichinopoly Muhammadan Society.	1928	Trichinopoly Taluk Fishery proposed to be given for the year ending 31st March 1928.	...	6,000

## APPENDIX VI.

List of institutions supplied with Zoological Specimens during  
1927-28.

			R5.	A.	P.
Agra	...	Agra College	65	8	0
		St. John College	40	8	0
		The Scientific Apparatus and Chemical Works	31	12	0
Aligarh	...	Muslim University	304	0	0
Allahabad	...	Alahabad University	280	11	0
Bangalore	...	Central College	107	8	0
		Medical College (Victoria Hospital)	18	0	0
		Government Collegiate High School	135	3	0
Baroda	...	Baroda College	15	12	0
Benares	...	Hindu University	156	8	0
Bombay	...	Grant Medical College	15	12	0
		Royal Institute of Science	25	0	0
		St. Xavier's College	15	12	0
Calcutta	...	Calcutta University	295	4	0
		School of Tropical Medicine and Hygiene	13	3	0
		Dr. Barnado	15	12	0
Dacca	...	Teachers' Training College	1	0	0
Dehra Dun	...	Forest Entomologist (Forest Research Institute)	10	8	0
Delhi	...	Lady Hardinge Medical College for Women	34	4	0
Gwalior	...	Victoria College	345	4	0
Hoshiarpur	...	Government Intermediate College	200	0	0
Ghora Gali	...	Lawrence Intermediate College	105	0	0
Karachi	...	Victoria Museum	192	0	0
Kolhapur	...	Rajaram College	148	8	0
Lahore	...	Government College	145	2	0
		The Punjab Veterinary College	166	8	0
Lucknow	...	Lucknow University	240	4	0
		King George's Medical College	5	0	0
		Isabella Thoburn College	43	0	0
Ludhiana	...	Government Intermediate College	178	0	0
Multan	...	Multan College	25	0	0
Mysore State	...	Government College High School, Mysore	90	0	0
		Maharani High School, Mysore	28	5	0
		State High Schools at Tumkur, Shimoga, Holar, Hassan, Chitaldrug and Chikmagalur	170	14	0

APPENDIX VI—*cont.*

List of institutions supplied with Zoological Specimens during  
1927-28—*cont.*

		RS.	A.	P.
Nagpur ...	Central Museum ...	27	4	0
Poona ...	Fergusson College ...	46	8	0
Rangoon ...	Judson College ...	65	4	0
	University College ...	12	8	0
Trivandrum ...	Maharaja's College of Science ...	6	12	0
Aberdeen University ...	... ..	72	0	0
Oxford University ...	... ..	16	0	0
Reading University ...	... ..	63	0	0
Ambasamudram ...	Setupati High School ...	15	12	0
Anantapur ...	Ceded Districts College ...	177	12	0
Calicut ...	Assistant Director of Fisheries ...	128	0	0
Changanacherry ...	St. Birchman's College ...	132	12	0
Cocanada ...	Pithapuram Raja's College ...	1	8	0
Coimbatore ...	Government Entomologist (Agricultural College) ...	15	8	0
	Government College ...	173	4	0
Ernakulam ...	Maharaja's College ...	27	0	0
Madras ...	Presidency College ...	165	0	0
	Madras Christian College ...	33	8	0
	Women Christian College ...	6	6	0
	Madras Club (Turtles) ...	54	0	0
Tirukkoyilur ...	Board High School ...	16	0	0
Colombo ...	Mr. Whitehouse and Moss Cantley ...	24	0	0
Anantapur ...	Dr. Narasimham ...	10	3	0
<b>Total ...</b>		<b>5,045</b>	<b>15</b>	<b>0</b>