

MADRAS FISHERIES DEPARTMENT

ADMINISTRATION REPORT

FOR THE YEAR

1924-25

BY

B. SUNDARA RAJ, M.A., Ph.D.,
Director of Fisheries, Madras

 Report No. 1 of 1926

Madras Fisheries Bulletin, Vol. XX, pages 1 to 78

MADRAS

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Report No. 1 of 1926.

ADMINISTRATION REPORT OF THE DEPARTMENT OF
FISHERIES FOR THE YEAR ENDING 30TH JUNE 1925

BY

Dr. B. SUNDARA RAJ,

Director of Fisheries.

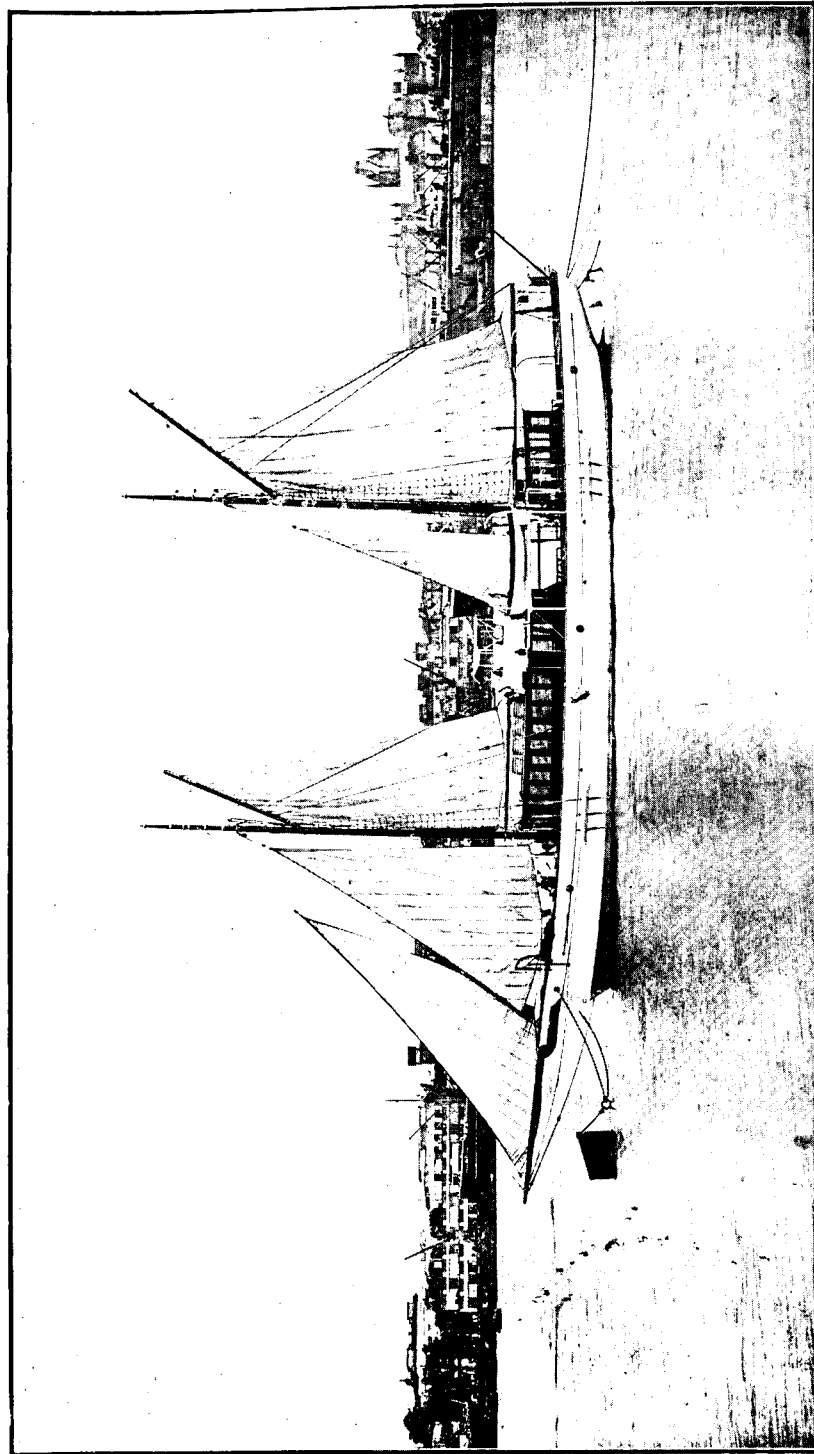
I have the honour to submit the Administration Report of the Fisheries Department for the year ending 30th June 1925. As the Fisheries year ends on 30th June, the reports and accounts from subordinate officers are not received in my office before the 15th or 20th August which leaves me insufficient time to make up the accounts and write the report by 1st September. Government have since the close of the year agreed to alter the due date of the report from 1st September to 1st October.

2. *Personnel.*—Information regarding the personnel of the gazetted staff will be found in Statement No. I appended. I was confirmed as Director on 1st November 1924. M.R.Ry. Rao Sahib J. A. Fernandez, Superintendent, Pearl and Chank Fisheries, and M.R.Ry. C. G. Chakrapani Ayyangar, Assistant Director of Fisheries (Inland), were also confirmed in their respective posts. Mr. M. V. Sankara Variyar continued as my Personal Assistant throughout the year. He has since reverted to his permanent post in the Secretariat and I am pleased to record my high appreciation of his character and work.

3. *Recruitment of officers.*—In G.O. No. 76, Public, dated 5th February 1924, the Government constituted a Board for the selection of suitable candidates for appointments in the subordinate ranks of Government service. Accordingly, in their Order No. 237, Development, dated 13th February 1925, the Government directed that, out of the posts of 8 Sub-Assistants, 6 Assistant Inspectors and 26 yard officers in the department, 5 Sub-Assistants,



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Frontispiece

"LADY NICHOLSON."

See page 20.

3 Assistant Inspectors and 13 yard officers should be directly recruited from among the candidates selected by the Staff Selection Board.

4. *Change of designation.*—Prior to April 1925, the designations of the non-gazetted staff of the department were not in keeping with the duties actually performed by them. Names, once appropriate, necessarily lose their significance or become anomalous when the duties of the officers change and this is inevitable in an infant department continually developing its sphere of operations. An attempt was made last April to designate officers according to their current work and unify such designations as far as possible where similarity of pay and work enabled this to be done. I give below the names of posts prior to April 1925 and the new ones adopted since :—

<i>Old designation.</i>	<i>New designation.</i>
Socio-economic Sub-Assistant	Inspectors of Fisheries.
Sub-Assistant attached to the Assistant Director of Fisheries (Inland).	
Sub-Assistant at Vizagapatam in charge of the fish-curing yards.	
Assistant Inspectors of Salt	Research Assistants.
Sub-Assistant in charge of the Tanur Experimental Station.	
Sub-Assistant in charge of the Zoological Specimen Supply Section, Ennur.	
Sub-Assistants doing research work at Calicut.	
Overseers in "Inland" section	Sub-Inspectors of Fisheries.
Petty officers employed in fish-curing yards.	Petty Yard Officers.
Senior Operator	Laboratory Assistant.
Laboratory Attendant	Fieldman.
Laboratory Assistant	Laboratory Attendant.
One clerk attached to the office of the Superintendent of Pearl and Chank Fisheries.	Chank Fishery Overseers.
Three clerks sanctioned for the Rāmnād chank fishery.	

5. As last year a great part of my time was taken up by administrative work, so much so, I was not able to do full justice to the technical and research work of the department. If I have been able to carry out the Inspection of Pearl Banks once, visit the Ceylon Pearl Fishery, conduct the important scientific investigations connected with the keeping qualities of canned fish and with the value of conservancy operations in the upper reaches of the Bhavāni river and work out the collections made at Krusadai Island of which the results are about to be published in the Madras Museum Bulletin, I could do so only by sacrificing all my holidays and leisure. The technological research at Tanur received scanty attention and I could not be present at the Indian Science Congress, Benares, nor could I devote the necessary time to Fisheries Research at Calicut and Ennur and to Inland pisciculture which require personal attention.

6. I visited on tour the West Coast four times, Tuticorin, Pāmban and the Northern Circars twice and the Bhavāni valley once. Of the Inland fish farms, I was able to inspect only one, viz., Sunkesula in September 1924. I gave evidence before the Economic Enquiry Committee and sent written answers to questions framed by the Indian Taxation Enquiry Committee.

7. The total expenditure of the department was Rs. 6,54,036 which includes Rs. 51,733 on account of socio-economic work and schools, supervision of oil and guano industry and the pay of the Assistant Director (Coast) and his office establishment whose time is mostly occupied with socio-economic work and education, all of which yield no returns in revenue. The total receipts amounted to Rs. 5,83,325. The profits over chanks amounted to Rs. 20,164 and the Inland fisheries yielded a substantial profit of Rs. 11,379. The biological and oyster supply and the aquarium have been made self-supporting. The latter brought in a net income of Rs. 1,790, while the fish-curing yards for the first time in their history ceased to work at a loss and yielded a surplus receipt of Rs. 14,956 over expenditure for the Fisheries year ending 30th June 1925. The expenditure on pearl fisheries, however, amounted to Rs. 19,882 without adequate returns which could only be expected in years when pearl fisheries are held. The Tanur Experimental Station and the Cannery continued to work at a loss, the former, due to a poor fishing season and the latter, owing to various causes enumerated in the body of the report.

CHALIYAM FISH CANNERY.

8. In paragraph 2 of G.O. No. 185, Development, dated 1st February 1924, the Government ordered the closing of the accounts of the Cannery on the 31st of March every year. Last year's report on the Cannery dealt with a period of only nine months, from 1st July 1923 to 31st March 1924, and the present report will review the working of the concern from 1st April 1924 to 31st March 1925, instead of for the Fisheries year from 1st July 1924 to 30th June 1925. During the year the Cannery continued under my direct control, with Mr. Baratan as Superintendent. The Assistant Director of Fisheries (Coast) was empowered by Government to visit the Cannery from time to time, and see to the proper maintenance of books and stock. The temporary post of Superintendent, sanctioned for a year from 1st November 1923, was further extended by another year.

9. *Machinery*.—The Director-General of Stores, London, to whom I complained about the defects in the oval dies for the double seamer supplied by him in the previous year and the rectangular dies for sardine tins obtained from him in 1921, had forwarded to me letters from the makers, Messrs. Bradley & Burch, Ltd., London, suggesting remedies to set right the defects. These suggestions were referred to the Acting Industrial Engineer in January 1925, who replied that some of the minor defects could be set right locally, but pointed out that as there appeared to be other serious defects such as bad tempering, etc., which could not be so remedied it would be better to send the dies to the supplying firm. Government, however, in their Memorandum No. 1926-11/25-1, dated 14th July 1925, ordered that the suggestions made by Messrs. Bradley & Burch, Ltd., in regard to both the dies should be given a trial by the Industrial Engineer in order to see whether they are feasible or not; so the Industrial Engineer has again been addressed in the matter.

10. *Output and sale*.—The year opened with a stock of 179,426 tins of all sorts. Owing to the large stocks held in oil-sardines and other lines, Government decided that the Cannery should stop manufacture of such goods. Only 42,677 tins were manufactured against 85,867 in the previous year. 33,886 tins were sold against 38,781 for the same period during the preceding year. One of the chief reasons for the decrease in sales was the fact that for a considerable period, no railway goods traffic was allowed owing to the damages caused by the floods on the West Coast.

11. As a result of representations received from several quarters that the public are not sufficiently informed of the shops where products of the industrial concerns such as the Cannery and the Jam factory are available for sale, and with a view to institute an intensive house to house campaign in selected towns for pushing the sale of jams and canned fish, Government have recently sanctioned the appointment, for a period of six months, of two travelling sales-agents—one for the Tamil districts and the other for the Telugu districts—and directed that these agents should concentrate their efforts on a few large towns, staying for a period of a fortnight or so in each. It is hoped that as a result of these appointments there will be an appreciable increase in the sale of canned fish. The canned fish exhibited at the British Empire Exhibition, Wembley, London, found a ready sale and as a result of the advertisement, Messrs. Menon, Son & Co., London, have offered to take up the agency for canned fish in Great Britain, Europe and America. The Government have since sanctioned the appointment of that firm as agents. Chaliyam goods were as usual sold at the Aquarium and other fishery stations at Ennur, Nellore, Kurnool, Vellore and Vizagapatam.

12. *Finance*.—The Cannery was brought under the commercial system of accounts on 1st April 1924. A sum of Rs. 10,000 was sanctioned as temporary accommodation during the year. Since 1st April 1925, Rs. 4,500 has been repaid and the balance outstanding on the date of the report is Rs. 5,500. The financial statements of the Cannery, prepared by the Auditors Messrs. Fraser & Ross, for the period under report, are appended. They show that the Cannery worked at a loss of Rs. 7,431-14-6. This heavy loss was due to the following unusual causes:—

- (1) Poor fishing season and consequent scarcity of fish,
- (2) Idle time consequent on reduced production since November 1924,
- (3) Unusually large number of tins written off,
- (4) Old labels written off,
- (5) Mr. Ginivan's deputation to Malaya,
- (6) Heavy audit fees and
- (7) Poor sales due to the dislocation of the traffic caused by floods.

13. *Tins written off*.—10,857 tins were written off during the year. Out of this number 8,285 tins were from the stock at Chaliyam which is an unusually large number, but the Superintendent has

explained that this was due to the close scrutiny that was exercised during the last quarter of the year in response to Government instructions contained in G.O. No. 108, Development, dated 21st January 1925. I personally checked a good number in connexion with the investigation as to the age up to which Chaliyam tins would keep. I also introduced a new system of turning over of each tin in stock, once in three months, to enable the oil to soak through the fish both at top and bottom. This is done in some of the canneries in Norway, where the "maturation" of stock has been specially studied, and is a great improvement on the old system of keeping tins stationary when the bottom layer of fish in tins alone get the advantage of the oil. Every tin in stock, therefore, has been handled with the result that many unsound tins which had escaped notice in previous years, have been discovered and eliminated. The wastage is unduly high if it is for a single year, but as explained above the wastage is to be distributed over several years. From next year forwards, I do not anticipate any heavy percentage of wastage, except perhaps in stock taken back from Messrs. McDowell & Co.

14. *Mr. Ginivan's deputation.*—In G.O. Mis. No. 1731, Development, dated 9th October 1924, the Government sanctioned my proposal for the deputation to the Straits Settlements of Mr. A. O. Ginivan in order to introduce the products of the Cannery into the markets of the Straits Settlements and Federated Malay States. Mr. Ginivan left for the Straits on the 6th of November and returned on the 16th of December 1924. Except for a small order, for about 15 cases of canned fish worth about Rs. 700, the deputation was a failure. He reported that there was a good market for the products of the Tanur station, but not for canned fish. The Chinese in the Straits Settlements and the Federated Malay States favour the cheapest variety of American "Sardines," any kind of small fish in tomato sauce packed in large 1 lb. tins, which are sold at very low prices. Competition on the part of large American packers is extremely keen, and their goods are firmly established on this market and consignments are handled on a very small margin of profit. In order to compete with the American import, the standard of our goods will have to be lowered, which however is undesirable. The cost of the deputation was Rs. 650.

15. *Heavy Audit Fees.*—Messrs. Fraser & Ross in their Audit Report, for the quarter and year ending 31st March 1925, have stated that till manufacture is recommenced, quarterly accounts

are unnecessary. The question whether quarterly audits are really necessary was raised, by me, in February 1925 and since Messrs. Fraser & Ross now agree that these are not required, I have reported to Government that the accounts need not be audited every quarter. This, if approved, will considerably reduce the audit fees.

16. *Research.*—In their Memorandum No. 2739-II/24-2, dated 3rd December 1924, Government asked me to experiment with the old stock of canned fish on hand and report as to the period up to which Chaliyam tins will keep and can be guaranteed as safe. So far as I am aware no investigation of these problems has been carried out anywhere in the tropics and this is the first time such a research is made. A report was accordingly submitted in my letter No. 2591-P/124-6, dated 24th August 1925. A brief summary of the findings deserves recapitulation here. The oldest stock available for testing were a few tins of curried and oil sardine of the year 1919-20. A comprehensive range of samples, from the packs of subsequent years up to 1923-24, was also scrutinized and tested. The oldest stock were found to stand all the known tests. The contents had a good taste except a faint smell of tin. This showed that the Chaliyam tins stored under tropical conditions can remain sound for at least five years. Select tins were examined chemically for dissolved tin by the Chemical Examiner to Government and his report showed that the amount of tin dissolved increased, as was expected, with the age of the tin and that in the oldest tin analysed, the percentage of dissolved tin was not more than 0.02 per cent, a perfectly safe and harmless trace. In the history of the trade no thoroughly authenticated case of tin poisoning resulting from canned foods is available. This is because the dissolved tin has been shown by various investigators to be so firmly absorbed in an insoluble form in the solid parts of the food as not to act poisonously. It is known that the minimum quantity of dissolved tin that may prove harmful is two grains to the pound, i.e., 0.035 per cent which is 75 per cent above the quantity (0.02 per cent) found in our oldest stock of tins. The process of detinning in tin fish was found to be 14.7 times as rapid in India (tropics) as in America (temperate zone). Judging from the rate of solution of tin in India, canned sardines would appear to be safe up to a maximum period of seven years in India, after which time they are apt to contain a sufficiently high percentage of dissolved tin, which may prove injurious to health.

TANUR EXPERIMENTAL STATION.

17. For three years in succession the fishing season proved a failure. Sardine and mackerel were both scarce and large fish also were not available, as in the previous year. The jails which used to order fairly large quantities of cured fish purchased little, since the transfer of the Mappilla prisoners to the Andamans where on account of the abundant local supply, cured fish are not in demand. Orders from the Military Department for fish oil were few, only 1,050 gallons being purchased by the Controller of Contracts during the year. The unprecedented floods of July 1924 cut off communications for months, rendering the prompt execution of orders impossible. This necessarily reflected adversely on the subsequent demand for Tanur products. Tanur Station therefore continued to work at a loss. The net debit was Rs. 3,763 against a loss of Rs. 1,275 in the previous year. Messrs. K. M. Naidu & Sons having failed to pay up their dues, a decree was obtained against them for Rs. 275-8-0 which is under execution. As the season was a failure the staff was reduced, resulting in a saving of Rs. 480. Government, in their Order No. 471, Development, dated 31st March 1925, directed that with effect from 1st April 1925 the accounts of the Tanur Experimental Station should be maintained on commercial lines. The date was subsequently altered to 1st July 1925, in G.O. Mis. No. 1926, dated 16th July 1925.

18. *Curing Operations.*—The purchase during the year amounted to 83,843 lb. of fish for Rs. 2,959-1-5 against 92,031 lb. for Rs. 2,455-15-7 in the previous year, which shows an increase in price over that of last year by 30 per cent, accounted for by the scarcity of fish. As in previous years the canoes and nets at Tanur Station were employed for fishing during the season, and the value of the Government share of the catch was Rs. 104-12-2, the total catch being valued at Rs. 342-2-0 against Rs. 219 in the previous season. Besides the supply to usual customers, the cured fish manufactured at the station were sold at Kurnool, Nellore, Chingleput and Vellore by the Assistant Inspectors in charge of Inland Fish Farms. Two consignments were sent to Burma and samples were shipped to a Singapore firm who had promised through Mr. Ginivan large orders amounting to several tons of salted mackerel, shark fins and other products, if samples prove satisfactory in quality and price. A wholesale trader from

Madras whom the Assistant Director (Coast) took to the station was disappointed at the smallness of the quantity manufactured. If successful business arrangements are made, the department will be in a position to pass on orders to approved curers in the fish-curing yards who have adopted the improved curing methods and sanitary conditions recommended by the department.

19. *Oil, guano and fish-meal operations.*—Due to the prevailing scarcity of sardine, there were oil and guano operations only on four days in the year. The raw material consisted of 41,851 lb. of sardine and 11,481 lb. of "podimeen" and resulted in the manufacture of 10,348 lb. of fish-meal and 313 gallons of oil and 297 lb. of guano. Only, 10,348 lb. of fish-meal were manufactured in the year as compared with 22,113 lb. in the previous year. The feeding experiments by the Deputy Director of Agriculture (Livestock) were hindered by the outbreak of disease in the farm. Experiments at the Hosur Cattle Farm showed that small quantities, as two ounces a day, have such bone building and fattening properties that a bull calf and heifer grew up steadily, attained maturity and started breeding at the age of two years. Enquiries have been received from Europe regarding fish-meal. The orders promised are in hundreds of tons but the quantity at present manufactured at the Experimental Station is too small for the purpose of establishing an export trade. These enquiries could be considered only after the installation of power-driven machinery for oil extraction and manufacture of fish-meal referred to in last year's report. The report of the Industrial Engineer, who visited California and inspected the fish-meal plants, is awaited. A small consignment of fish-meal was sent to Burma. Advertisements have been inserted in the "Ceylon Observer," Colombo, and "Straits Times," Singapore.

RESEARCH AND EXPERIMENTS.

20. *Cured Fish.*—Research designed to prevent or mitigate the defects in cured fish, such as "pink eye" and moulds, rusting and saline excrescence, started last year were continued. The more important results obtained were:

(1) Sodium benzoate and bisulphide, in proportions of 1 : 20 of salt, had a very favourable effect in preventing "pink eye." Raw mustard powdered and mixed with salt, in the proportions of 1 : 20 has proved very effective in preventing black and white moulds

on the surface of cured fish stored for ten months. In the control experiments, fish without mustard developed these moulds in the course of a month.

(2) As rusting is suspected to be due to the oxidation of the exuded fat, storing the cured fish in an atmosphere of carbon-dioxide was tried but showed no appreciable improvement. On the other hand, keeping fish with self-brine in pickle was more effective.

(3) Antiseptics, such as sodium benzoate, had no appreciable deterring effect on the appearance of saline excrescence in semi-dried prawns in storage; thereby indicating that the cause of the phenomenon is not bacteria. Prevention of a free access of air seems to have a favourable effect, apparently because evaporation is thereby prevented. Further experiments, in the light of the results obtained, are in progress at the station.

21. *Fish oil*.—Through the courtesy of the Superintendent, Government Ophthalmic Hospital, Mr. Hornell arranged to have the best Tanur oil tested for vitamin in the hospital, but the test applied obviously cannot be sufficiently accurate and scientific to decide on the vitamin contents of the oil. Further, such a delicate test can only be satisfactorily carried out by an expert in an up-to-date and well-equipped laboratory. Arrangements have been made for testing the vitamin contents of the oil through the Director of the Imperial Institute, London.

22. *Paint oil*.—A very successful experiment has been made in the preparation of a brown oil for paints from crude fish oil. Paint applied as an experiment to galvanized roofing proved that fish oil paint lasts longer than ordinary paint mixed with linseed oil. The deodorization also has been in a large measure successful, but the drying properties are not satisfactory and further experiments are under contemplation.

23. *Fish-meal*.—The chief problem engaging the attention of the station with regard to the manufacture of fish-meal is the unduly high percentage of fat in the meal. Fish-meal from "podimeen" has a low oil content, viz., 4 per cent and was sold at 4 annas a lb.; but sardine fish-meal which has a higher percentage of oil could be sold only for 1 anna 6 pies a pound. New methods for the reduction of the oil content are under trial. The failure of the sardine season has necessarily handicapped experiments and research. A small laboratory, badly needed at

the Tanur Station, was fitted up during the year with chemicals and apparatus for analysing fish oil and manures and for various chemical and bio-chemical tests and experiments. Private manufacturers and merchants could now get their oil and guano analysed and certified on the payment of a small fee.

24. At the request of the Director of Industries, Bihar and Orissa, Mr. G. N. Sinha, the District Fishery Officer, Puri, was permitted to undergo training at the Tanur Station from 8th February to 30th April 1925 in the curing of fish, specially prawns, as this is one of the chief industries of the Chilka Lake. As the season was particularly bad, he was not able to see the various curing methods and processes.

25. *Prawn curing in Collair Lake*.—There is an extensive prawn fishery, worth several lakhs of rupees, in the Collair Lake. A few experiments conducted there last season by the Inspector of Fisheries, Vizagapatam, proved successful and the demand for the prawns from the Collair Lake exceeded that from Tanur. Further experiments will be made for curing prawns here and testing the market with them.

26. *Abandoned Oil and Guano Factory*.—The Oil and Guano Factory at Cannanore where experiments were originally started by Sir F. A. Nicholson was sold off during the year. After the department ceased to conduct operations at Cannanore the factory had been sub-leased to private parties which led to misunderstandings between the Jenmi and the sub-lessees. It was therefore decided to dispose of the sheds and hand over the site to the Jenmi.

27. *Private Oil and Guano factories*.—During the year 515 factories took out licences against 440 in the previous year. Very few factories, however, actually conducted operations owing to the failure of the sardine season. In the market prices ruled high, guano was sold at Rs. 150 per ton, oil at Rs. 300 per ton and fish manure at Rs. 120 per ton. It is estimated on a rough calculation that 4,000 tons of guano, 2,000 tons of fish oil and 1,000 tons of fish manure were manufactured last year, valued at Rs. 4,25,000, Rs. 4,16,000, and Rs. 1,00,000, respectively, against 22,500 tons of guano, 7,250 tons of fish oil and 17,000 tons of fish manure, valued at Rs. 13,15,000, Rs. 14,50,000 and Rs. 6,80,000, respectively, in the previous year. The season proved disastrous to many who were unable to fulfil contracts entered into in anticipation of a good season. There was no regular inspection of fish oil factories by

the Fisheries staff, as the factories did not do regular work. The Health Inspectors of Local Boards also do not seem to have felt the need for regular inspection. In consequence of the representation made by this department, the Government were pleased to instruct the Kottayam Taluk Board to refrain from levying fees from factories in respect of which fees were collected by the Tellicherry Municipality.

PEARL AND CHANK FISHERIES.

28. After a lapse of over quarter of a century, the prospects of pearl fisheries for a series of years on the Indian coast appear most promising.

29. The results of inspections conducted during the year have shown that oysters have reached their maximum size on many of the banks and that their growth and condition are satisfactory in every way. On the Tholayiram par alone, there are nearly 12 crores of mature oysters, which will justify two or three large pearl fisheries in Tuticorin, should the oysters continue to thrive and yield pearls of sufficient value.

30. As expected, the chank fisheries, which are the Department's main source of revenue, suffered, a serious reduction, on account of the pearl fishery in Ceylon during last March and April. The best chank season comprises the months of February and March. All chank fishing during this period had to be suspended, as the divers left India in a body for the much more remunerative and less arduous pearl fishery operations in Ceylon. This was unavoidable. Whenever there have been pearl fisheries in the past, chank fisheries more or less automatically ceased. Thus during the years 1886 to 1890 and 1902 to 1907, a series of pearl fisheries in Ceylon paralysed the chank fishery at Tuticorin and little or no revenue was realized. But the scarcity of chank shens in the market, due to the pearl fishery and the consequent high prices are expected to partly make good the loss. The net profit realized was only Rs. 3,844 against Rs. 35,368 in the previous year. But for the special efforts to retain the services of divers in chank fishing up to the time of the actual opening of the pearl fishery in Ceylon and to re-entertain the divers immediately after the close of the pearl fishery, though tired and unwilling and sufficiently "rich" to be disinclined to work, there would have been a loss on the year's working. The Superintendent and staff deserve to be congratulated on the success of their efforts.

31. A statement of receipts and charges over chank and pearl fisheries is given below :—

	Expenditure.			Revenue.			Profit (+) or loss (-).		
	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.
1. Tinnevely Chank Fishery.	13,721	6	1	22,722	6	7	9,001	0	0
2. Ramnad Chank Fishery ...	14,332	1	0	1,762	4	9	-3,569	12	3
3. Sivaganga Chank Fishery.	207	6	0	73	13	4	-133	8	8
4. South Arcot Chank Fishery.	...			955	0	0	955	0	0
5. Chingleput and Nellore Chank Fisheries.	...			760	0	0	760	0	0
6. Tanjore Chank Fishery ...	...			2,750	0	0	2,750	0	0
7. Pearl Fisheries ...	18,863	11	11	3,561	14	6	-15,301	13	5
8. Miscellaneous :—									
Decree amount realized from Messrs. J. B. Dutt & Sons, Dacca :—									
Tinnevely ...	...			929	6	8	12,438	2	9
Ramnad ...	...			11,508	12	1*			
9. Supervision charges, 50 per cent of the pay and travelling allowance of the Superintendent for chank fisheries and 25 per cent of the same for pearl fisheries—vide G.O. No. 2037, Development, dated 28th November 1924.	3,055	4	3	...			-3,055	4	3
Total ...	50,179	13	3	54,023	9	11	+3,843	12	8

* Represents godown rent and interest.

PEARL FISHERIES.

32. In March and April last, a detailed inspection of pearl banks off Tuticorin and Tiruchendur was carried out by me in company with the Superintendent, Pearl and Chank Fisheries. Of the 28 beds that were found stocked, the larger beds were examined in detail. All previous inspections were of a cursory nature

and consisted only in ascertaining the presence or absence of oysters on the banks. This was all that was necessary as the oysters were quite young. But now they have reached their maximum growth and not a few bear pearls. Consequently this year the inspection had to be a lengthy and an exhaustive one. As usual in such inspections, the banks were buoyed out in quarter mile squares and samples were lifted in each square at prescribed intervals. The method is referred to by Mr. Hornell in pages 168 and 169 of the Madras Fisheries Bulletin, Volume XVI (1922). In actual working, however, the method had to be considerably modified and altered, and the procedure now evolved overcomes many practical difficulties. From the number and condition of the numerous and thoroughly representative samples brought up from each square, the number of oysters on the banks is computed; the contour of the banks and the general condition of oysters such as growth, size, etc., are also ascertained. Such great care has been taken to make allowances for errors that are bound to creep into calculations of this kind based on averages, that I am confident that the number of estimated oysters, nearly 24 crores, is decidedly less than the actual number of oysters on the banks. Allowing for casualties, that always occur, an under-estimate is safer and is always preferable.

33. Immediately before deciding upon a pearl fishery, it is customary to lift a representative collection of oysters and wash them for pearls. This will be done in October next. The total number of oysters estimated on the banks are nearly 24 crores, of which the oysters in the southern portion of the Tholayiram par and beds adjoining it can be fished early in 1926, if the yield of pearls is satisfactory.

34. *Pearl Fishery Ordinance*.—For the first time this year, Government framed rules under section 6 of the Indian Fisheries Act of 1897. I consider legislation in Madras on the lines of the Ceylon Pearl Fishery Ordinances of 1925 is necessary both for scientific and administrative reasons. The extent of our pearl banks is nearly 770 square miles while the Ceylon banks are only 572 square miles. Though the Ceylon banks are less than $\frac{3}{4}$ the size of ours, they have yielded 55 fisheries against 22 on the Indian coast in the course of the last two centuries and there is no comparison between the proceeds and revenue in India and Ceylon. I give below figures for Ceylon and Madras since 1708 for years when there were simultaneous fisheries.

Year.	Madras.	Ceylon.
1708	£9,000	8,848
1747	£5,000	21,400
1748	£9,560	38,580
1749	£5,300	68,375
1828	Rs. 70,127	3,05,234
1830	Rs. 1,01,639	2,22,564
1860 and 1861 ...	Rs. 2,50,276	3,66,816
1889	Rs. 1,89,984	4,98,377

Except in 1708 the fall in income in Madras is as marked as the increase in proceeds in Ceylon. There can be no doubt that the greater care and attention paid to the pearl banks in Ceylon are largely responsible for the greater frequency and better financial returns of the Ceylon fisheries as compared with Madras, though on all accounts the Tuticorin pearl fisheries were as famous and remunerative as those of Ceylon in the past. If our fisheries have deteriorated of late, I cannot help but conclude on the evidence of the available records of inspections and reports, that we are largely to blame, for admittedly our banks have been allowed to be poached or destroyed and there have been a lack of frequent and regular inspections and of efficient scientific supervision and organization. My personal experience resulting from the last inspection also bears conclusive evidence as to the prevalence of poaching and destruction on the banks. In the pearl beds at the mouth of the Tuticorin harbour there were a large number of dead and opened shells in perfect condition, while there were practically no such on the Tholayiram par and other more distant and out-of-the-way banks, a circumstance which admits of no explanation other than undue human interference.

35. Biologically the nature of our banks, the oysters *Margaritifera vulgaris* that yield the pearls, their appearance, age and growth and disappearance and the conditions that produce the pearls in them, are identical with those of Ceylon. The difference in number and yield of pearl fisheries, in India and Ceylon, in recent years is therefore inexplicable unless it is due to the effective protection and scientific control enforced in Ceylon, by legislation, for years and the absence of such regulations here.

36. Administratively also, a Pearl Fishery Bill has been a long needed piece of legislation. While Ceylon had taken steps years ago to protect her pearl fisheries by legislation, no steps appear to have been taken in that direction in Madras. In India the protection of the banks, rules and regulations relating to fisheries are

dependent on custom and usage. The Ceylon banks lie off an uninhabited coast unlike ours. Protective legislation is not therefore so necessary there as it is in the case of our banks. Pearl fishing camps are necessarily of a temporary character built of flimsy material which afford little or no protection to person or property, while they attract the richest merchants in the country. The elimination of criminals is therefore imperative. With all the rules and regulations of the Ceylon Camps, there was a very serious robbery in 1905 when some 30,000 rupees worth of pearls were robbed. When a large number of people congregate in a small area in the tropics where oysters have to be permitted to rot for the extraction of pearls, strict sanitary rules have to be made and enforced.

37. For the above administrative and scientific reasons an ordinance seems highly necessary, which will legalise the declaration of pearl fisheries, the prevention of theft of oysters and pearls, the prohibition of unauthorized fishing on the banks and the numerous regulations required for the conduct of pearl fisheries, hitherto, framed and enforced on the authority of vague and unwritten custom, while it will confer great benefits biologically on the banks.

CHANK FISHERIES.

TINNEVELLY CHANK FISHERY.

38. A total of 97,501 full sized, 12,343 undersized and 1,514 wormed shells were fished during the season under report as against 276,486 full sized chanks, 21,523 undersized and 5,826 wormed shells in the previous season.

39. At Idinthakarai, 298 shells were collected in nets against 438 during the previous season.

40. A total of 12,794 immature shells, i.e., shells below $2\frac{1}{4}$ " diameter were fished of which only 451 were returned alive to sea against 18,855 returned during the previous year. The poor return was due to the divers extracting the flesh for which a ready sale could be found at Tuticorin.

41. The season commenced on the 23rd October 1924 and fishing went on until the 17th February 1925 when it had to be closed as all the divers left for Ceylon. On account of unfavourable weather, 23 days were lost as against 43 during the previous season. Anticipating that the chank work will suffer on account of the

pearl fisheries, arrangements were made to bring in 53 Rāmnād divers so that sufficient quantity of shells might be fished in advance, but the weather conditions did not permit good work being done by those men for any length of time. An outbreak of cholera among the divers discouraged the men greatly and though there was no casualty, they were not inclined to stay. The camp was as in the previous year shifted to Tharuvaikulam, but the weather was bad and little could be done. The largest number of divers who went out to sea on any one day was 82, against 156 during the previous season and they were distributed as follows:—

Kilakarai divers	...	...	...	25
Periapatnam divers	...	...	...	9
Tirupalakudi divers	...	...	...	13
Arab divers	...	...	...	1
Tuticorin divers including fresh recruits	...	...	...	34
				82

The divers returned from Ceylon about the middle of April and attempts made to make them work at Tuticorin did not wholly succeed, as they were tired after the pearl fisheries and wanted to take rest. The average earning per head per day on the fishing days was Rs. 1-10-7 against Rs. 2-1-4 during the previous season. The comparatively poor earnings were due to the fact that the divers worked only in the poor part of the season.

42. *Towage*.—"Leverett" was utilized for towing work for 79 days, "Sutherland" for 3 days and "Sea Scout" for 1 day.

43. The contract entered into with the Dacca Industrial Union for a period of two years from 1923-24 season expired on 30th June 1925. The Government have since sanctioned a renewal of the lease for a period of two years to the Union at Rs. 350 per 1,000 Tinnevelly chanks.

RĀMNĀD CHANK FISHERY.

44. The current lease expires on the 30th June 1928 and negotiations are on foot with the Raja of Rāmnād for an extension of the lease. Divers in large numbers are available at present only on the Rāmnād Coast and the possession of the Rāmnād Fishery is a help in securing good divers for the adjacent Tuticorin Fishery.

45. In the year under review the Rāmṇād Chank Fisheries worked at a loss of Rs. 3,703-4-11 against a profit of Rs. 7,649 in the previous year. During the twelve years of the lease, this is the second year when a loss was sustained, the first year of loss was 1913-14 when the fishery worked at a loss of Rs. 4,500.

46. To minimize the loss the Superintendent, Pearl and Chank Fisheries, made arrangements to fish as many chanks as possible in the different centres before the pearl fishery commenced, but, the proper season for good fishing was those months in which the pearl fishery was held and hence it was not possible to increase the output. It is impossible to stop divers from going to the pearl fishery, as the earnings they make at a pearl fishery can in no way stand comparison with the earnings in the chank fishery. The only way by which loss could be minimized is to get a good price for the shells as the prices are bound to go high on account of the scarcity of chanks in the market. The Dacca Industrial Union have agreed to give a rate of Rs. 320 per 1,000 for all the "Jadhi" quality shells and this I expect will greatly minimize the loss if it does not yield a profit.

47. The total catch amounted to 81,087 shells as compared with 177,275 in the previous season, the details being as follows:—

	1924-25.	1923-24.
1. Rāmēswaram, including		
Mandapam	21,250	88,390
2. Kilakarai, including South		
Vedalai	18,797	13,880
3. Tirupalakudi, including		
North Vedalaipatti ...	41,040	75,005
Total ...	81,087	177,275

48. Five hundred and forty shells were returned out of 4,005 immature shells brought ashore.

49. The considerable fall in the number of shells fished in Rāmēswaram, was due to the fact that there was practically no fishery at that place as there were no divers. The season here is very short and is limited to the months of March and April when the pearl fishery in Ceylon took place. There were no divers except boys who were learning diving. The increased rate of 1¼ anna induced the boys to venture out to the inshore beds and they fished a fair number.

50. At Kilakarai 18,797 shells were fished, as against 13,880 during last season. The season here commenced in October and closed in February. As most of the divers remained at Kilakarai during this period owing to disputes with the Ceylon Government, it was possible to fish more shells than last year. On account of the pearl fishery, divers who had migrated to Rangoon and Straits Settlements returned in numbers and they regularly went out to sea with a view to get practice. Fishing is being done in the inshore beds and the divers do not make more than 3 annas per head per day. The shells are very scarce inshore, being only stray migrants from deeper waters, but the quality of the shells is very good. The poor earnings do not induce the men to go out to sea in large numbers and it would be desirable to raise the rate for these shells to the same level as Rāmēswaram shells. The Dacca Industrial Union have agreed to give them the same rate as for the Rāmēswaram shells. I do not propose at present to recommend an increase, as the next few years will be lean years and it would be necessary to keep down expenditure as much as possible.

51. At Tirupalakudi 41,040 shells were fished, against 75,005 during the last season. The poor results were due to the discontinuance of fishing in the months of February and March. No "Valampuri" or right-handed shells were obtained.

52. The small fishery at Sivaganga brought in 918 shells, against 3,033 shells collected during last season and caused a loss of Rs. 133-8-8 as against Rs. 74-4-1 during the previous year.

LEASED CHANK FISHERIES.

53. The lease of the Tanjore chank fishery expired with 31st July 1925 and the fishery has been re-leased for a period of 35 months from 1st August for Rs. 3,710.

54. The South Arcot Chank Fisheries brought in a rental of Rs. 955, while the rental received from the Chingleput and Nellore district chank fisheries was Rs. 760.

BECHE-DE-MER FISHERY.

55. This year 1,900 lb. were cured as against 1,926 lb. during the previous year. The charges incurred on account of the fishery came to Rs. 619-10-11 and the cured product is expected to fetch Rs. 700 as per quotation recently received from a Singapore firm introduced to us by Mr. Ginivan thus giving an estimated profit of Rs. 80-5-1.

FISHERIES' VESSELS.

56. The "Lady Nicholson" was lent to the Revenue Department for the inspection of the Laccadive Islands from 23rd December 1924 to 18th February 1925 and a sum of Rs. 3,074 was realized as hire charges for the vessel. She was taken to Marichikadi during the Ceylon Pearl Fishery and was engaged on this trip from 2nd to 13th March 1925. She was also engaged in a detailed examination of the Pearl Banks during March and April.

57. The "Leverett" was engaged for towage of chank canoes at Tuticorin and on pearl fishery duty. As there was no chank fishery at Rāmēswaram, she was not employed in the Rāmnād Chank Fishery but was on commission for 84 days in the inspection of pearl banks.

58. The "Sutherland" was employed for the examination and patrol of pearl banks. During the year she went out to sea for 70 days. She was also now and then used for the transport of salt to yards close to Tuticorin and on the inspection of Pearl Banks.

59. The "Pearl" was solely engaged for work in the Rāmnād Chank Fisheries. She was stationed at Tirupalakudi to tow the chank canoes there.

60. The "Sea-Scout," on account of her good speed, was utilized now and then for the patrol of pearl banks. As the chank fisheries stopped, she was not used for the towage of chank canoes.

61. All the vessels were subject to the usual annual overhaul. "Lady Nicholson" was docked at the Kundugal slip-way, prior to her departure to the Laccadive Islands.

ADVANCES AND LOANS.

62. *Advances to divers.*—An advance of Rs. 1,053-15-0 was issued to divers, mostly to the Kilakarai men, to work at the Tuticorin Fishery. The men were not available at the proper fishing season and attempts made to make them work, in the months of November and December, were not fruitful, as the weather was unfavourable. It was possible to recover only a sum of Rs. 196-6-0 and the balance had to be added to the old arrears. The outstanding balance on 30th June 1925 was Rs. 2,362-7-3.

63. The next few years will be pearl fishing ones and, as the chank fishing will be poor, it will be difficult to recover the arrears from the earnings at the chank fishery. It might be possible to recover a part of the advances from the earnings at a pearl fishery, but most of the amount could be recovered only when the chank

season recommences. It is therefore desirable to carry forward the advances until then, though every attempt will be made to recover them from the pearl fishery earnings of the divers.

64. *Loans to divers.*—A sum of Rs. 23-8-0 was outstanding as loan for purchase of boats to divers. During the year under report a further loan of Rs. 200 was issued and a sum of Rs. 68-5-0 was recovered, leaving a balance of Rs. 155-3-0 outstanding on 30th June 1925.

65. *Law suits.*—A sum of Rs. 1,460-1-1 towards godown rent and interest was realized in 1923-24 against the decree amount from Messrs. J. B. Dutt & Sons, and the same was included in that year's accounts. The balance of Rs. 933-15-7 including interest remained as outstandings, and against this a sum of Rs. 929-6-8 was realized on 23rd March 1925. There is still a balance of Rs. 4-8-11 to be recovered, the realization of which amount is being arranged for, through the Government Pleader, Tinnevely.

66. Messrs. J. B. Dutt & Sons filed a petition in the High Court for a stay order against the execution of the decree in the Rāmnād Court pending disposal of their appeal in the High Court, which was refused. The High Court, however, granted the firm time for the payment of the decree amount till two weeks from the re-opening of the lower court after the summer recess. Messrs. J. B. Dutt & Sons have now paid into the court the sum of Rs. 13,132-12-6 the total amount decreed as due from them towards value of chanks, interest, godown rent, etc.

67. *Research.*—The proposed lines of research with regard to pearl and chank fisheries could not be started as the Krusadai scheme has not yet materialized.

68. As regards the diving with modern equipment for chank, preliminary arrangements have been made but as yet I have had no time to conduct the experiment.

INLAND PISCICULTURE.

69. With the improved finances of Government some advance in new directions became possible. One of the long delayed, nevertheless urgent, schemes, viz., the expansion of the fish farm at Praema, on the Nallamalais, was sanctioned. Adverse natural conditions, however, resulting from destructive floods in the Cauvery and drought in some districts, hampered inland pisciculture as in the previous year. Also in the Nellore and Chingleput districts the Department encountered strong combinations and a

determined effort on the part of certain villagers to keep down rentals of Fisheries in auction sales of tanks, which were in a large measure successfully surmounted by accepting reasonable private bids, secured by the vigilance of local Fisheries officers attending the sales and by the aid and co-operation of officers of the Revenue and Public Works Departments.

70. The total receipts from Inland fisheries were Rs. 1,09,467 against Rs. 1,13,383 in 1923-24 and the total expenditure was Rs. 98,088 against Rs. 97,029 in the year previous, yielding a profit on the year's working of Rs. 11,379 as against Rs. 16,354 in the preceding year. Had it not been for the adverse factors mentioned above and more specially for the failure of rain, considerably increased profit would have accrued. The following list of waters which brought in very little rentals on account of the failure of rain will indicate the loss of revenue sustained on their account:—

Name of tank.	Compensation.	Previous rentals.	Present rentals
	RS.	RS.	RS.
Tinnanore	615	220 (1924) 1,710 (1923) 610 (1922) 1,450 (1921)	60
Nemam	288	297 (1924) 900 (1923) 205 (1922) 675 (1921)	110
Uttiramerur	903	Nil. (1924) 1,000 (1923)	201

71. In Development Department G.O. Mis. No. 1502, dated 25th August 1924, the Government ordered that all cases, in which the Fisheries Department proposed to dispose of the fisheries under its control by private arrangement, should receive their sanction. In actual working, difficulty is experienced in adopting this procedure. I will address Government separately on the matter.

72. The fisheries of the following tanks in the Nellore and Chingleput districts, which did not fetch adequate rents in public auction due to a combination among the bidders, were leased out by private arrangement, with the sanction of Government.

Name of tank.	Highest bid in auction.	Disposed by private tender.	Gains.
	RS. A. P.	RS. A. P.	RS. A. P.
Oratti tank	21 0 0	75 0 0	54 0 0
Idagalli tank	8 0 0	25 0 0	17 0 0
Gangapatnam	33 0 0	56 0 0	23 0 0
Anantavaram tank of Varakavi-pudi taluk	51 8 0	100 0 0	48 8 0
Madara jagudur tank	5 12 0	35 0 0	29 4 0
Vallur tank	36 0 0	72 0 0	36 0 0
Penubarti tank	Nil.	51 0 0	51 0 0
Kovur tank	172 0 0	310 0 0	138 0 0
Viduvaluru	42 0 0	105 0 0	63 0 0
Choukocheria	35 8 0	65 0 0	29 8 0
Zuvaladinni	Nil.	55 0 0	55 0 0
Duvvur tank	610 0 0	710 0 0	100 0 0
Kanigiri tank	1,750 0 0	2,000 0 0	250 0 0
Total	2,764 12 0	3,659 0 0	894 4 0

An additional revenue of Rs. 894 was secured by disposing of these fisheries by private arrangement instead of in open auctions.

73. *Stocking operations.*—Owing to the partial failure of rains in some parts of the Nellore, Chingleput, Chittoor and Salem districts several important tanks did not receive adequate supply of water and consequently could not be stocked; those that received full supply of water were stocked with quick growing varieties of Carp, Mullet and Etroplus as hitherto. Into the Cauvery, this year, were introduced 1,340 fingerlings of *Catla catla* from the Northern Circars.

74. Since the issue of G.O. No. 100 I., dated 20th February 1914, the following irrigation works were constructed and the fisheries of these waters according to the terms of the order belong to Government:—

Peddi Naidu tank,
Mopad tank.
Kocheruvu tank.

Siddapur tank.
Venkatapuram tank,
Yellanur tank.

Panjampatti project.	Nagavaram tank and
Bhavanasi tank.	supply channel.
Dondapad tank.	Ukkayapalli project.
Atmakur tank.	Berijam project.
Sangamaheswarapuram tank.	Toludur project.

Of the above, the first seven are being regularly stocked and auctioned. The Toludur project (Willingdon reservoir) and the Bhavanasi tank were stocked for the first time this year with *Etrophus*, notwithstanding their distance from the railway. The fisheries of Bhavanasi tank fetched a rental of Rs. 54-10-0 in 1924-25. The question of auctioning the fishery of the Willingdon reservoir and the irrigation channels thereunder is under correspondence with the Executive Engineer concerned. Both on account of its vastness and the permanency of its water, the fisheries of this reservoir are expected to prove on further investigation susceptible of great development. The Berijam reservoir on account of its high altitude can be stocked only with Trout, English Carp and Tench, which is rather a costly undertaking. The Secretary, Palni Hills Game Association, has recently approached me for advice and help in connexion with the stocking of the Berijam lake with trout. If the Association stocks the lake, there will be no need for the Department to incur any expenditure on this account, while it will be entitled to half the receipts, vide G.O. No. 2762, Revenue, dated 5th December 1916.

FISH FARMS.

75. The five fish farms, viz., Sunkesula (Kurnool), Ippur (Nellore), Vellore Fort Moat (North Arcot), Powder Factory (Madras) and the Larvicidal Farm at Praema (Kurnool) continued their work on usual lines and the fry from these farms were distributed during the year to tanks and channels in their neighbourhood.

76. *The Sunkesula fish farm* continues to labour under the same difficulties as in previous years, caused by the inadequate water-supply from the Tungabadra river and the high cost of pumping of water to the ponds.

77. The Government have recently sanctioned the construction of additional ponds at Praema (G.O. Mis. No. 679, Development, dated 6th May 1925). When the ponds are completed and brought into working order, the congestion now felt at Sunkesula will be considerably relieved. The difficulties arising from the scarcity and cost of water-supply which hinder the work at Sunkesula, do not exist at Praema as the farm will be watered

by a perennial spring at the foot of the Nallamalais, and levels permit of free flow through the proposed ponds.

78. I inspected the Sunkesula Farm in September 1924 and found its condition far from satisfactory. The main causes that had led to the deterioration of the stock of fish and ponds were (1) the want of an efficient fence to prevent the village cattle from trampling down the bunds of the ponds and (2) failure to take steps to prevent the heavy ingress of coarse fish which were coming into the ponds by the direct pumping (instead of through the filtering reservoir) adopted since 1919-20 owing to drought and the consequent scarcity of water in the Tungabadra. The former has now been set right by the provision of a wire fence costing Rs. 169, and the latter has been remedied by the construction of a silting reservoir at a cost of Rs. 474. I had the Gourami ponds netted, cleaned and the breeding fish selected and placed in suitable depths of water in the cleaned ponds before leaving Sunkesula. The improvements effected in the farm have already resulted in the prolific breeding of the Gourami, which had yielded few or no fry since 1921. Further attention is necessary if the farm is to be restored to its former efficiency. I hope to pay further personal attention to the scientific work of the fish farms in future till the Assistant Director (Inland) and his staff are thoroughly trained for the work.

79. *Ippur Fish Farm.*—During the year under report, there was no dearth of water which has been threatening this farm for the last four summers. In the hot weather, when water sinks in the fish ponds, a number of predaceous birds resort to the farm and take a heavy toll of fish; the vastness of the ponds in this farm makes it impossible to cover them entirely with nets to exclude these birds. The farm has been provided with an efficient gun this year to keep off the birds.

80. The Gourami in this farm have not been satisfactorily breeding ever since their introduction. The large area of the pond was considered by Mr. Hornell to be the adverse factor at work as early as 1918-19, but the need for retrenchment has not hitherto permitted alterations to the pond which should be carried out before this important matter could be decided.

81. *Powder Factory Farm.*—As a large number of undesirable fish had found their way into the small pond at the Powder Factory, arrangements were made during the year to drain and

from the experience gained and results obtained during the last eight years, this Department is now in a position to take up. A cheap and abundant supply of water, facilities of transport to the important markets are desiderata for the success of this scheme. Since the Mahanandi scheme was abandoned due to religious scruples, the question of finding out a suitable site near some of the natural springs which abound in the Kurnool district has been engaging my attention. With the help of the District Forest Officers in Kurnool, a list of springs, in the Yerramalais, suitable for pisciculture was drawn up. Most of these springs were inspected by the Assistant Director (Inland) and he has reported that two streams near Chinna Tekkur and Nannur are likely to prove suitable. I will inspect these springs shortly and submit to Government proposals for the formation of ponds for growing Gourami, on a commercial scale.

88. *Mopad Farm.*—It has not been possible to take charge of this farm from the Public Works Department as the constructional defects noticed have not yet been rectified. The staff at the farm was engaged in deep-water fishing experiments in the reservoir throughout the year, and a sum of Rs. 782 was realized by the sale of fish captured against Rs. 758 in the previous year. The difficulty of finding a ready market for fresh fish adverted to in last year's report had been partly overcome by curing the unsold fish and selling them when there was a demand. The cured fish is reported to have a good flavour and taste and is liked by the people; it is sold at 4 annas per pound.

89. During the year under report, one of the two canoes used for fishing purposes got completely damaged during a severe storm; this considerably handicapped the work and arrangements are being made with the Executive Engineer, Bezwada, to get a steel boat for fishing purposes.

90. *Chingleput Fort Moat Farm.*—Nothing has yet been done to rectify the defects in sluices and shutters and to provide the proposed railway culvert and field channel. The farm has not therefore been brought into working order. The moat is, however, being regularly cleaned and stocked with larvicidal fish to keep down the mosquito nuisance and the resultant incidence of malaria in the Reformatory School.

91. *Kanigiri-Duvvur Scheme.*—In G.O. No. 219, Development, dated 10th February 1925, it was decided to abandon this scheme as the tank is silted up and has been running dry year after year.

clean the pond by transferring the Gourami to a private pond in Choolai.

82. Additional ponds in Madras city for the rapidly increasing stock of Gourami at Perambur have become a necessity. My predecessor, Mr. Hornell, addressed the Government in the Public Works Department, to permit the Fisheries Department to utilize for fish breeding and rearing such of the ditches in the abandoned Government Brick Fields at Chetput as were suitable for the purpose. Mr. Hutton, the then Chief Engineer and Secretary to Government, at first approved of the scheme; subsequently, however, the Government in the P.W.D. Memo. No. 79-Wks. B. 21, dated 29th November 1922, vetoed the scheme for reasons given therein.

83. In lieu of the proposal to fill the pits with sea-sand which I understood was under investigation, I suggested in February last to the Superintending Engineer, Madras Circle, an alternative scheme which will meet the aims of the Public Works Department at very much less cost and provide this Department with the ponds that at present it badly requires. My scheme was that some of the far-lying pits should be further excavated and the earth therefrom utilized to fill in pits closer at hand and adjacent to the Poonamallee High Road. This scheme, if approved, would avoid the great cost and inconvenience of fetching sea-sand, which in all probability is likely to outweigh the profits which the Housing Committee anticipate by filling in the pits and disposing of the area for house sites.

84. In view of the considerable savings that, I anticipate, will result by adopting the alternative scheme suggested above whereby the charges incurred by Government in deepening one set of ponds will be paid by the sale of house sites made available by the filling in of others, and of the fact that it will meet the aims of both the departments, I requested the Superintending Engineer to have estimates prepared for the alternative scheme and move Government for a reconsideration of their orders passed in November 1922. The Superintending Engineer has replied very recently that the Executive Engineer's reply on the subject is awaited, that every endeavour will be made to expedite matters and that it is not possible to say when a reply can be sent. I am however forwarding the proposal in Part II of the Budget Estimates for 1926-27.

85. *Vellore Fort Moat Farm.*—In the year under report the moat did not get sufficient supply of water during the rains and in consequence three sections of the moat were practically dry. The northern section of the moat which is very deep and contains permanent water was stocked with 450 *Etiopis* and 16,000 larvicidal fish. The total income derived from this farm including lotus leaves, grass and fish in the dried up sections was Rs. 1,030. In addition to the restoration of the dam, across the Nakkal Kalva adverted to in the previous year's report, the leading channel from the dam to the moat, which was found to be choked up with silt, had to be cleaned. The channel has now been completely restored with the help of the local officials of the Public Works Department, and it is hoped that during the ensuing north-east monsoon the moat will receive full supply of water.

86. *The Praema Larvicidal Farm.*—The construction of additional ponds was sanctioned in G.O. No. 679, Development, dated 6th May 1925. During the year 42 water holes on the Nallamalais were stocked with 19,300 larvicidal fish from this farm. It is reported that there is an appreciable decrease in the prevalence of malaria in the tracts adjoining the waters dealt with by the Department, viz., Praema, Nagaluti and Bairluti.

INCOMPLETE AND NEW SCHEMES.

87. One of the primary aims of the Inland Piscicultural section from the beginning was to provide an increasing supply of good cheap fish in the markets in the interior. This is partly done by conserving, regulating and improving the stock of fish in tanks and rivers. But the best fresh-water fish for table purposes is the Gourami, which has been introduced from Java and Mauritius. The experiments so far conducted show that the fish is well adapted for cultivation in small ponds for market purposes. Kurnool is one of the districts that badly suffer from an inadequate supply of fish and in consequence the first fish farm (Sunkesula) was built in this district and besides stocking the Cuddapah-Kurnool canal and tanks, the farm has been experimenting with the commercial possibilities of growing Murrel and Carp in the adjoining Edrur swamp for supply to the market in Kurnool with varied success. The swamp is fast silting up and very soon will prove unsuitable. Further it is not fitted for experiments in the cultivation and marketing of the exotic Gourami, which

The deep-water fishing experiments originally proposed to be conducted here are carried on in the Mopad reservoir where permanent water of great depth exists.

92. *Ganjām Tank Stocking Scheme.*—This scheme was first submitted to Government for sanction in 1922, but so far it has not been possible to proceed with the scheme for financial reasons. Recently Government have expressed their willingness to consider this and other delayed schemes, and it has been sent up as one of the new schemes in Part II of the Budget Estimates of 1926-27.

93. *The Russellkonda Fish Farm.*—I drew up this scheme in 1921 as an adjunct to the Ganjām tank stocking scheme. It aims at establishing a fish farm near the Russellkonda reservoir for breeding non-indigenous fish both for sale and for stocking irrigation tanks. As soon as the scheme for stocking the Ganjām district tanks materializes, proposals for this farm will be submitted to Government. Preliminary investigations have been carried out and suitable sites selected. Unlike the Sunkesula fish farm, the ponds proposed can be supplied with water, by direct flow, from the Russellkonda reservoir which financially is a great advantage.

94. *Tippu's tanks, Coondapoor.*—The two tanks, Kotakeri and Kodi were stocked with the fingerlings of *Chanos*. When the introduced fish attain a good size, the fish will be auctioned. Though under G.O. No. 2877, Revenue, dated the 26th September 1911, a reward of Rs. 5 was promised for every crocodile shot in the tanks, nobody has so far claimed the reward notwithstanding the fact that several people in the locality are holding gun licences.

95. *Cuddapah Antimalarial Scheme.*—The Peddagadi pool and the Pullamadugu, in the Seshachalam Hills, in the Cuddapah district, were not stocked with larvicidal fish during the year since they were found full of this fish at the time of the last stocking.

EXPERIMENTS AND RESEARCH.

96. *Gourami.*—The stock of this exotic fish in all the three fish farms, viz., Sunkesula, Ippur and Powder Factory continued observation and no further experiment or research is feasible until the new farms at Praema, Mopad, Chingleput and Chetput materialize.

97. As the Mopad reservoir received its full supply of water during the last north-east monsoon, the increased depth of water



Two typical nests of Gourami from Powder Factory Farm, Perambur, Madras.

and the presence of submerged trees and rocks render fishing difficult and dangerous. The introduction of a new method of fishing suited to the conditions obtaining in the reservoir is under investigation.

98. *Etroplus suratensis* (Pearl Spot).—This excellent variety of food fish bred so prolifically, in the fish farms, that it was possible to stock several tanks with its fry in the districts of Bellary Nellore, Chingleput and Kurnool.

99. *Mullets*.—Mullet fry from estuaries were utilized as usual in large numbers along with *Etroplus* in stocking various tanks in the Nellore and Chingleput districts. But the operation is still purely empirical and requires considerable research, before all the facts concerning Mullets and the conditions governing their growth in fresh water are ascertained and utilized. Only few of the numerous species of Mullets grow to a marketable size and of these still fewer are adapted to live in fresh water. It is therefore necessary, if mullet-stocking is to yield any result, to distinguish the fry of the large fresh-water mullets from others. This has not been done so far. The characters of the fry remain yet to be determined before selective stocking of fresh-water tanks, with these fry, could be done on a scientific basis. The research was started by me at Ennur Station in 1920, but the work had to be suspended as the Marine Biologist, Mr. R. H. Whitehouse, claimed that he was engaged on the same research. His report subsequently published shows that his work did not cover the question I was investigating at Ennur. The Inspector of Fisheries (Inland) has been instructed to undertake the work under my personal supervision in the laboratory attached to the Aquarium.

100. *Catla catla*.—During the year under report 1,340 fingerlings of this fine variety of Carp were introduced into the Cauvery, below the Hoginkal falls. Much experience has been gained with regard to the conditioning and carrying of this species over long distances by cart and rail, in transporting this fish from the Northern Circars to the Cauvery. It is clear that only fish measuring three inches and above travel well over long distances; they require conditioning for about 48 hours before starting on the journey. In the beginning it was thought that muddy water was conducive to safe transport, but it is found by actual experiment that fish travel much better in clean water. Given the right sized fish properly conditioned and cool weather, the fingerlings could

be carried any distance, provided an intelligent attendant gives changes of water now and then during the journey.

101. *Hilsa*.—Success in the artificial fertilisation and hatching on a commercial scale of Hilsa eggs has been achieved by experiments at the Lower Anicut hatchery from 1909 to 1921. The method of rearing the fry to a stage when they are able to fend for themselves remains to be done. The Collair Lake in the vicinity of the Kistna and Godāvari appears to afford the necessary facilities for the work. A scheme for instituting further experiments in the Collair Lake is under the consideration of Government.

102. *Tench*.—Most of the original stock which has been kept for eight years at Sunkesula and which bred in 1921 have unfortunately been lost by their transfer to an unsuitable pond in 1923, necessitated by the congestion in the Sunkesula fish farm explained above. A fresh batch introduced in 1923 is now being acclimatized.

103. *English Carp*.—English Carp, introduced into the Sunkesula fish farm in February 1923, continued to thrive well, as was the case with the previous lot which was brought to Sunkesula by Mr. Wilson in 1915. They have increased in size from 8"—9" last year to 8½"—9½". Though they are in fine condition, there is no sign yet of their breeding.

MISCELLANEOUS.

104. *Co-operative movement*.—The Humpapuram Fishermen Society of the Kollegal taluk, which had taken on lease the fishery of certain sections of the Cauvery, continued to work satisfactorily. The Kontalpad Fishermen Co-operative Society in Kurnool district adverted to in last year's report, was given, with the approval of Government, the lease of the fishery of the Tungabadra Anicut near Sunkesula and the first 11 miles of the Kurnool-Cuddapah Canal including Ottukunta for Rs. 500 for the year 1924-25. A newly formed fishermen society in the South Arcot district applied for the lease of the fishery of the lower Coleroon Anicut system; the matter is pending with Government. Another society of the fishermen of Komarapalaiyam of Gobichettipalaiyam taluk, Coimbatore district, has expressed its desire to take up the fishery of the Bhavāni river in the Gobichettipalaiyam taluk and the matter is under correspondence with the Collector of Coimbatore. The fishermen of Nandyal, Markapur and Cumbum are being

induced to form a society, so that they may take up the fishery lease of the Nandyal and other tanks. The fishermen of Nelattorpalaiyam and Kondurpalaiyam and Tummalapenta, Nellore district, have expressed their willingness to form societies; the Assistant Registrar of Co-operative Societies, Nellore, has been addressed on the matter.

105. *Nilgiri Fisheries*.—In Government Memorandum No. 3179-II/23-4, dated 25th June 1924, I was requested to report whether the expenditure now incurred on the protection and conservation of the upper reaches of the Bhavāni and the Moyar was essential in the interest of the fisheries lower down, whether any real protection was carried out, and if so, whether this protection work should not be taken over by the Fisheries Department. In my letter Ref. No. 1343-I/24-II, dated 10th February 1925, I reported after a tour of investigation that it was a fact that fish-rents of the Bhavāni and Cauveri rivers had increased in recent years but that, as rents give only a very vague indication of the actual value of fisheries, it was impossible to say how far the increase was attributable to conservancy operations in the upper reaches of the Bhavāni and Moyar. There were other more important factors which contributed to the increase of rents, such as (1) the prevention of annual fish beats and dynamiting at the Hoginkal falls, (2) the general increase in the price of food-stuffs and (3) the good effect of attendance at all important fishery auctions of an officer of the Fisheries Department, to break up strong local combinations when they tried to keep down rentals. I recommended that conservancy operations should be continued, in the interests of general fisheries and food-supply as well as sport, as a large number of fish occurring lower down bred here including the Mahseer, the best sporting fish in India. If Government agree that the conservancy operations should continue, a responsible officer of the status of the Inspector of Fisheries, Nilgiris, is indispensable for the work and I have proposed that the present Inspector of Fisheries and his staff of watchers in the Bhavāni valley might be transferred to the Fisheries Department. The orders of Government are awaited on this proposal.

106. There were several enquiries about fish and fish-culture. The following cases deserve mention: Mr. P. Gove, Trustee of the Local Fishing Preserve, Delhi, was furnished with detailed information as to how to rear fish fry, protect them against predaceous fish, identify fish and other matters connected with

breeding. Mr. Cotton of the Anamalai Estate was provided with detailed particulars about the cost of transport of Mahseer fry from Kurnool to the Anamalais.

PUBLIC FISH-CURING YARDS.

107. *General*.—This is the first year that the department administered all the fish-curing yards of the Presidency, which were transferred to its control on 1st April 1924.

108. There were 107 fish-curing yards at the commencement of the year of which Maipad yard in the Nellore district was closed in May 1925. The number of yards at the end of the year was therefore 106. Proposals for the closure of Kadapakam yard in the Chingleput district and Bembellur in the Malabar district and the opening of two new yards in their places, in these districts, are under consideration. The Kizhur yard, though sanctioned in the previous year, was not opened during the year, owing to the delay in the construction of curing sheds. Only two sheds have been completed and as soon as half a dozen or more sheds are built the yard will be opened. My proposals for the opening of a new yard at Mulapeta submitted to Government during the year have since been sanctioned. A private fish-curing yard was opened by Annappa Marakala, at Padu Thonse, in the South Kanara district.

109. Transactions at the fish-curing yards during the year under report are given in statement No. XI. The weight of fish brought to the yards was 1,305,027 maunds and cured fish weighing 755,872 maunds were removed from the yards. The total quantity of salt issued was 204,307 maunds and the price realized amounted to Rs. 2,55,384.

110. *Curing-sheds and utensils*.—The four fish-curiers at Mangalore who had been offered a loan of Rs. 25 each, sanctioned in the previous year, to enable them to remodel their sheds did not avail themselves of the offer. Of the 49 thatched curing sheds in the Cannanore fish-curing yard, 43 were converted into new model sanitary sheds before the expiry of the official year ending 31st March 1925, and the amount provided for the reconstruction of the remaining six sheds lapsed to Government. But five out of these six have since been remodelled with the help, it is understood, of the President of the Thayyil Arya Jana Co-operative Society. The last shed has been dismantled for reconstruction but owing to a disagreement between the curier and the President, the latter is reported to have declined to give assistance to the work. The curier

concerned is an impecunious old woman and she has applied for the grant of a loan of Rs. 130 for the purpose of completing the reconstruction of her shed. The Government have been addressed to sanction a reappropriation of Rs. 900 to grant an advance to this as well as the other five curers, to whom the Co-operative Society has advanced money.

111. The Meladi yard had an extensive drying ground. About half the extent of land, measuring 1 acre and 25 cents, was found to be above the requirements of the yard and was surrendered to the Revenue Department in June 1925. This has contributed to a reduction of Rs. 302-8-1 in the amount to be recovered from the ticket holders towards the construction of the yard.

112. Unusual weather conditions prevailed on both the East and West Coasts, causing extensive damage to the fish-curing yards. On account of heavy rains and unprecedented floods on the West Coast, loss of sheds, fence and drying ground was sustained by the 11 yards, viz., Vadanapalle, Blangad, Chowghat, Edakazhiyur, Kootayi, Parappanangadi, Beypore South, Quilandy, Tellicherry, Manjeshwar and Mangalore. Of these the following four deserve mention:—

Tellicherry.—The sea there eroded the foreshore, destroyed the western fence and undermined the combined office and weighing shed, which collapsed. Owing, however, to the prompt action taken by the yard officer, all the material of the fence and the building were secured.

Parappanangadi.—The sea washed into this yard up to the office building, throwing down the western fence of the yard. Drainage water from the town as well as the sea have eroded the northern portion of the drying ground, which is in danger of being washed away. Protective measures are under consideration.

Talayi.—The western fence of this yard was so damaged by the sea that it had to be reconstructed.

Quilandy.—Here also the western fence had to be replaced and the sea came up to within a few feet of the office. The gate house and the weighing shed were damaged by storm; the latter had to be practically reconstructed.

113. In the East Coast, a cyclone destroyed the following eleven yards:—Baruva, Balligalluru, Geduru, Iskalapalem, Peddakarinnamipalem, Pattisonapur, Markandi, Manchineelapeta, Pundi, Nelattur and Mukkur. The total estimated loss to property in the first nine yards is about Rs. 6,000.

114. This is the second year in succession, when fish-curing yards in the Northern Circars have been damaged by cyclonic weather. The Board of Revenue provided Rs. 25,000 in the Budget Estimate for 1924-25 under "petty construction and repairs," in view of the unusual damages caused by the cyclone of 1923. Greater damages have been sustained by the yards in 1924. As the amount provided in the budget was comparatively small to carry out the required repairs, I am making a larger provision in the Budget Estimate for 1926-27, with a view to reconstruct the damaged yards.

115. *Operations in yards.*—Of the 52 yards on the West Coast, Uppala, Talayi, Meladi, Kurikuzhi and Kasargod are steadily declining in operations, either because of opening new yards in their neighbourhood or because they are situated in the shadow of big capitalists' yards like Tellicherry and Quilandy. On the East Coast, Vanagiri, Point Calimere and Tranquebar also show a decline in operations.

116. The Mappilla curers, who were expelled from the Cannanore yard in 1921-22 for declining to obey the new rules regarding the drying of fish, were allowed to re-enter the yard if they agreed to abide by the new rules. One of them gave this undertaking and has been given a ticket. He has constructed a commodious and substantial shed and is conducting curing operations on an extensive scale.

117. *Salt supply.*—The unusually early rains this year, occurring as it did in the wake of two successive cyclone-ridden years precipitated a salt famine in Northern Circars which sent up the price of excise salt to an abnormally high rate. From April 1925, the price per maund of salt ranged even as high as Rs. 1-2-0 excluding duty; consequently, arrangements had to be made to supply the requirements of the yards in the Circars from monopoly factories. Though this arrangement entails more expenditure by way of transport charges, the aggregate expenditure works out to a much cheaper rate than that on excise salt.

118. Owing to salt arriving from Tuticorin only after the fishing season had commenced, nine yards in South Kanara and two in Malabar were without salt for some days in the year. It has been estimated that 44,455 maunds of fish were cured with 6,920 maunds of duty paid salt, during this period. Arrangements are already in progress for the early transport of salt during the current season.

Hilsa Hatchery, Lower Anicut, Coleroon, constructed in 1909, where the process of successfully fertilizing and hatching Hilsa eggs on a commercial scale was determined for the first time after several years of research.

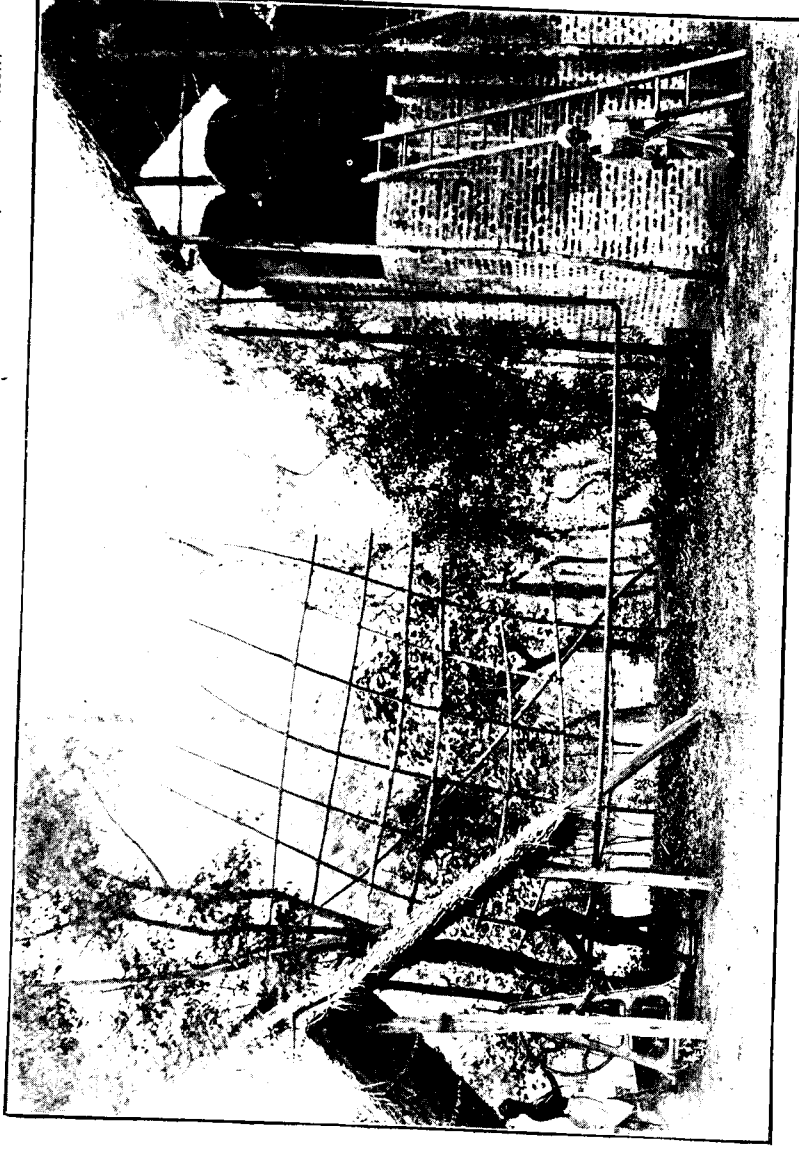


Fig. 1.—Pump and Reservoir—Hilsa Hatchery, Lower Anicut.

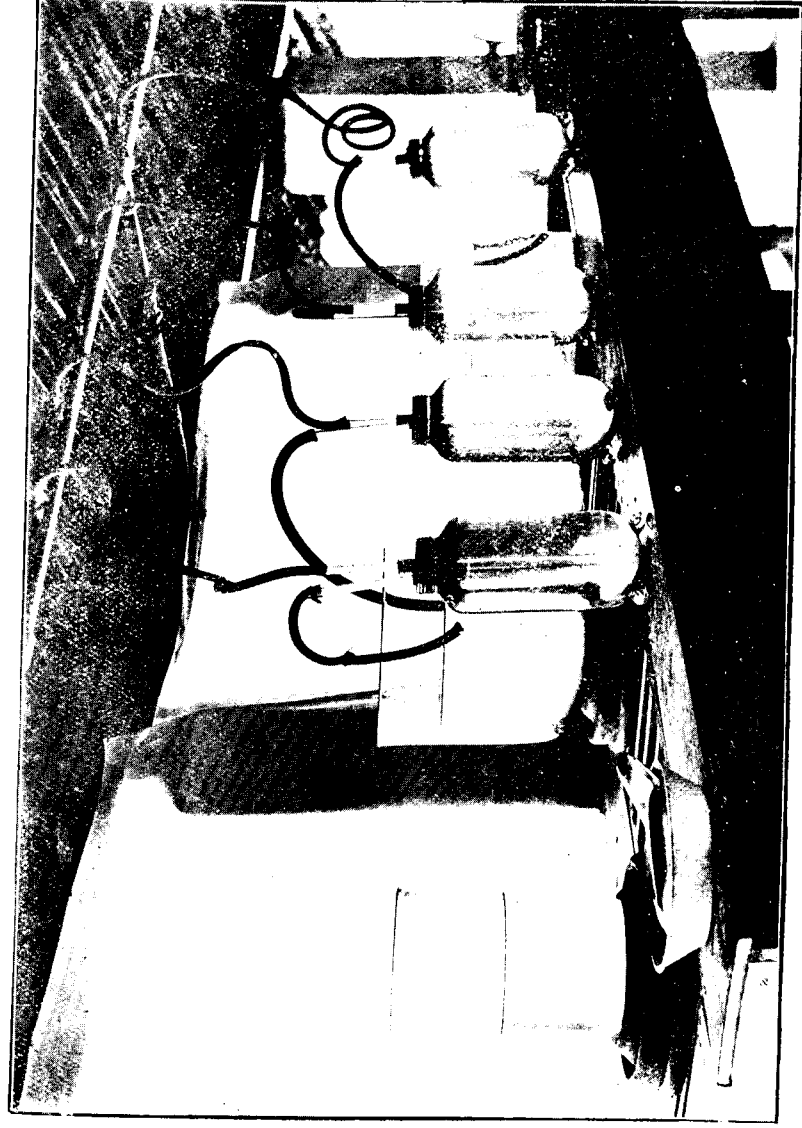


Fig. 2.—Battery of Macdonald jars for hatching eggs of Hilsa—Hilsa Hatchery, Lower Anicut.

119. *Salt storage and wastage of salt.*—A good many of the store sheds in the West Coast yards have low floors, in consequence of which the bottom-layers of salt-bags suffer serious wastage of their contents by percolation. Formerly when the issue price of salt was low, the curers were willing to take the short-weight bags. Now naturally they decline to receive them; consequently, the contents of these bags have to be rebagged and wastages written off. The unprecedented floods of 1924 affected the stock of salt in many yards, especially, Madai, Mannalamkunnu, Edakizhiyur, Blangad Chowghat, and Bembellur. The wastage on the West Coast was 3,381 maunds and 28 seers and that on the East Coast was 11 maunds and 8 seers making a total of 3,392 maunds and 36 seers. Of the above, 2,600 maunds were lost owing to the sinking of a schooner and 328 maunds and 24 seers were jettisoned from a schooner, owing to rough weather during its voyage to the West Coast.

120. *Shortage of salt.*—As regards the shortage of 202 bags of salt at the Malpe I yard referred to in last year's report the Government have ordered the recovery of the issue price and duty from the yard officers responsible, viz., Mr. B. Narayana and Mr. T. C. Madhavan. The latter refused to take delivery of 73 bags of salt brought to the yard by the transport contractor, on the assumption that all the salt consigned to the yard had been correctly received. It has since been ascertained that these 73 bags were consigned by the transport contractor of the Salt Department from Malpe I to Hangarkatta and received at the latter port but not taken to the Hangarkatta yard. These must therefore have passed into illicit consumption.

121. *Unauthorized cess.*—At the Tanur North yard a system of levying a cess at the rate of one pie per seer of salt issued was started in 1921 with the sanction of the then Assistant Director of Fisheries, with a view to the construction of reformed curing sheds, when the accumulated cess amount to the credit of the curers would enable them to do so. The cess amounts were being remitted in the name of the individual curers to the Post Office Savings Bank. After the Sub-Inspector who was in charge of the yard, prior to 1st April 1924, was transferred to the Excise Department, it was discovered that he was not making regular remittances to the Savings Bank and that to cover part of the collections that he had to account for, he had executed promissory notes which it is understood he has since redeemed. During the official inquiry, the registers of the

fish-curing yard, which would give the quantity of salt issued to each curer and therefore the cess amount collected from each curer, were stolen from the yard. The Police also investigated and reported the case as undetectable. The further action that should be taken is under the consideration of Government.

122. *Brine curing* does not seem to make any headway. The chief obstacle is the fact that there is no market for fish cured in this way. Although it is cheaper to cure fish using brine, and the fish looks better and tastes better, the fish consumer is not accustomed to it. The curers also contend that it does not repay the trouble taken and time spent in collecting and filtering brine. They complain that the brine filters out very slowly and that one has to be constantly employed to clean out drip holes and stir the brine when the flow is obstructed. After a great deal of trouble when a quantity of brine has been collected, they have to throw it away owing to there being no fish during the days when the brine continues wholesome. If they are to use self-brine, compulsion has to be applied, but this, of course, is not contemplated. During the year, 6,288 maunds and 22 seers of fish were cured in brine against 8,299 maunds of fish in the previous year.

123. *Fisheries statistics.*—As proposed in my last Administration Report, for the first time this year, a beginning has been made to collect statistics regarding the value and quantity of sea fish landed as well as to record observations of great scientific and economic value to the fisheries concerned, such as the breeding and other habits, occurrence and abundance of the more important edible sea fish. Suitable forms for the purpose have been devised and instructions as to how to record observations have been issued to the yard staff. By experience, I find that the yard staff on the West Coast are now distributed have very little opportunity to attend to this work except in the neighbourhood of their respective fish-curing yards and that a large body of itinerating officers with limited jurisdiction will be required if the collection of statistics is to be satisfactory or complete. I have hopes that the reorganization of the subordinate fish-curing yard staff, I am about to propose, will provide the necessary agency.

124. *Staff.*—Prior to 1st April 1925, the West Coast had been divided into two sections, South Kanara and North Malabar forming one section and South Malabar another section. Mr. U. Nagappa Sub-Assistant, was in charge of the socio-economic work and Mr. A. K. Krishnan, Assistant Inspector of Salt, in charge of the

fish-curing yards in the northern section. Mr. K. Ambady, Sub-Assistant, and Mr. A. Ravunni Menon, Assistant Inspector of Salt, were similarly in charge of the socio-economic work and fish-curing yards, respectively, in the southern section. All the four had their headquarters at Calicut prior to 1st April 1925, but with effect from that date the Government permitted a division of work, whereby the coast was divided into three sections each under a Sub-Assistant to be designated "Inspector of Fisheries," all the items of work pertaining to one section being looked after by the Inspector and staff of that section. The northern section comprises the whole of the South Kanara district with headquarters at Mangalore, the central section, all Malabar excepting the Ponnani taluk, with headquarters at Calicut and the southern section, the Ponnani taluk, with headquarters at Ponnani. Each Inspector is assisted by a yard officer on Rs. 35—1½—50—1—60 who in addition to the inspection of yards in charge of petty yard officers (previously designated petty officers) assist the Inspectors in clerical work. The post of the relieving yard officer has been replaced by a shorthand clerk in the office of the Assistant Director (Coast). To meet the extra cost of these yard officers, the temporary posts of assistant yard officers sanctioned for eight months for Tanur North, Calicut, Cannanore and Malpe I have been abolished and three posts of petty yard officers have been created, two for four months for Malpe I and one for eight months for Tanur North. A post of attender has also been sanctioned for the office of the Assistant Director (Coast). Three yard officers on Rs. 35 each, were also sanctioned on the East Coast to assist the Superintendent, Pearl and Chank Fisheries, the Assistant Director of Fisheries (Inland) and the Inspector of Fisheries, Vizagapatam, in the supervision of yards.

125. Mr. A. Ravunni Menon, the senior of the two Assistant Inspectors, deputed by the Salt Department for the supervision of fish-curing yards had drawn an advance of Rs. 500 in November 1923, for petty construction and repair works. In June 1924, the Collector of Salt Revenue reminded the Assistant Director (Coast) that the amount had not been adjusted and during the course of enquiries by the latter he discovered that part of this amount and certain payments made on vouchers (which proved to be false) had been misappropriated by Mr. Ravunni Menon. The total amount involved was Rs. 901 and this amount was during the course of the enquiry repaid by him. The Assistant Inspector's

conduct was brought to the notice of the Collector of Salt Revenue and Ravunni Menon was eventually dismissed.

ISSUE PRICE OF SALT.

126. Salt is supplied to curers in the fish-curing yards, duty free. The issue price of salt has been fixed from time to time, at a price which was intended to cover the entire cost of manufacture, transport and other expenses. This price, until 1918, varied in different yards. A uniform rate of 10 annas per maund was adopted from 1st January 1918, but again owing to the enhanced cost of manufacture, transport and of establishment, the arrangement resulted in a heavy loss to Government. With a view to minimise loss on the working of the yards which in the year 1922-23 amounted to as much as the receipts, the issue price of salt was doubled from 1st April 1924. Many representations have been received from curers for a reduction in the issue price, but the question could not be considered till the effect of the rise in the issue price on the fish-curing industry could be judged by a year's working. In response to G.O. Mis. No. 764, Development, dated 12th April 1924, asking me to submit proposals for the economic working of the fish-curing yards in order to render them self-supporting after a year's experience of the work, I submitted a report reviewing the administration of the fish-curing yards from 1st April 1924 to 31st March 1925. I found that the enhanced issue price of salt had no effect on the working of the West Coast yards, but caused a serious fall in operations in the East Coast yards. On the West Coast there are no salt factories, and all salt required is transported from Tuticorin or from Bombay. Further, the market salt which is obtained from Bombay is dark in colour and coarse-grained and consequently, unsuitable for curing purposes. Therefore the prices that range on the West Coast are always much higher than those prevailing on the East Coast, where there are a large number of salt factories distributed all along the coast. From actual enquiry, I found that the price of salt in the bazaar at Malpe was Rs. 5 to 5½ per bag; whereas the issue price of salt at the yards was Rs. 2-8-0 a bag, leaving an appreciable difference of Rs. 2-8-0 to Rs. 3-0-0 per bag. On the East Coast, however, due to the immediate proximity of fish-curing yards to salt factories, there is practically no difference between the issue price of salt in yards and the bazaar price of the same salt. I found at Sathankuppam, for instance, that the

bazaar price of salt is Rs. 3-4-0 a bag, and the issue price in the yard being Rs. 2-8-0 per bag. There is a difference of only a few annas, hardly sufficient to induce curers to resort to the yards and submit to the regulations in force there. There are other yards where the difference is still less. In consequence, the operations in the East Coast yards have materially fallen during the year 1924-25. The expenditure over the fish-curing yards during the year ending 31st March 1925 amounted to Rs. 3,14,753 and the total receipts from the sale of salt at the enhanced issue price of Rs. 1-4-0 a maund including miscellaneous receipts and the value of salt on hand on 1st April 1925 amounted to Rs. 3,15,384, showing a credit balance of Rs. 631 for the first time in the history of fish-curing yards. The Government have recently ordered that pensionary charges of the permanent establishment of the fish-curing yards calculated at $\frac{1}{6}$ in the case of superior staff and $\frac{1}{16}$ in the case of inferior staff of the pay should also be debited to the accounts. This if added would result in a debit balance of Rs. 6,766 on the year's transaction. The expenditure this year is abnormal owing to various causes such as floods, cyclones, sinking of schooners, etc., and the receipts were not adequate on account of the poor fishing season on the West Coast and the enhancement of the issue price of salt which caused a decline of operations on the East Coast. The average consumption of salt in the fish-curing yards during the five years ending 1923-24 is 263,360 maunds and in a normal year this quantity should easily be consumed in the fish-curing yards. Assuming that this quantity was purchased, transported and sold in the year 1924-25, the total expenditure would have been Rs. 94,470 for establishment, travelling allowance, petty construction and repair works and Rs. 1,79,002 for cost price of salt at the yards, and the total receipts would have been Rs. 3,29,000 being the sale-proceeds of salt at the issue price of Re. 1-4-0 per maund leaving a credit balance of Rs. 55,527. This if distributed over 263,360 maunds works out roughly to 3 annas 4'4 pies per maund. In a normal season, therefore, I concluded that it should be possible to balance expenditure against receipts in fish-curing yards if a reduction corresponding to the percentage of profit (3 annas 4'4 pies or annas 3 and pies 4 in round figure) per maund be allowed in the issue price. If, however, pensionary charges of the permanent establishment employed in the fish-curing yards at $\frac{1}{6}$ in the case of superior staff and $\frac{1}{16}$ in the case of inferior staff of the pay actually drawn by them are debited

to the accounts, the profit of Rs. 55,527 referred to above would be reduced to Rs. 48,131 and the profit on a maund of salt would not admit of the reduction of a pie per seer of salt. Reductions of less than a pie per seer of salt are inadmissible for account and administrative purposes. The issue price is to be so fixed as to enable the ignorant fish curer and the meagrely educated fish-curing yard staff to calculate the cost on salt issued in seers easily without fractions of pies. If the issue price of salt be fixed at Re. 1-0-8 a maund, a seer of salt will then cost 5 pies and this will be the nearest approach to the condition mentioned above. Checking-officers may however find it difficult without detailed calculations to check total cost of salt issued or sold in the books of the yard, but this difficulty, I consider, should be subordinated to the needs of the ignorant fish curer, very often a woman, who could not be expected to calculate fractions of pies for small quantities of salt she may buy. Also, it will prevent the fish-curing yard staff from defrauding the curers of fractions of pies.

ECONOMIC WORKING OF YARDS.

127. The economies I have effected, in the working of the yards during 1924-25, consist of a reduction in the cost price of salt and transport charges to the West Coast. The possible lines of economy in the administration of the yards are as follows :—

128. (1) *Purchase of Salt.*—The Salt Department's price for salt varied from year to year. In 1923-24 it works to Re. 0-3-1, whereas I have been able to secure excise salt, at the very low rate of Re. 0-0-11 in 1924-25, due to the condition of the Tuticorin salt market. But for the number of lessees who were anxious to get rid of their accumulating stock of salt, I may have had to pay a higher price. In future, also, if any economy is to be effected over the purchase of salt, the only method would be to take full advantage of any favourable condition of the market and when such opportunities occur, salt must be purchased for the yards in bulk. This would mean considerably more storage accommodation for salt in the yards and the centrally placed gollahs on the West Coast. I have discussed in detail the need for extra storage accommodation and the economies that will accrue in the case of West Coast yards, in my letter Ref. No. 1838-F 24-1, dated 9th September 1924. With the present storage sheds, full advantage cannot be taken of the state of the market.

129. (2) *Transport of salt to the West Coast.*—In the financial year 1923-24, the Salt Department paid for transport on an average 0-9-1'5 pies per maund, against which I have paid only 0-6-5'2 pies per maund of salt. The marked difference is, however, due to the absence of any railway transport in the financial year 1924-25 and only to a slight extent, to the favourable transport rates of the sea transport contractor. The Salt Department in 1923-24 paid their contractor at the rate of Rs. 12-8-0 and Rs. 12-13-0 per ton whereas I was able to obtain, by open tender, a flat rate of Rs. 11 per ton. I feel, however, that the largest possible economy in the expenditure over fish-curing yards remains yet to be effected in the matter of transport of salt to the West Coast yards. I have mentioned in last year's administration report the economy in transport that could be effected, if a trawler is purchased. I expect there will be a saving of about Rs. 43,000 a year, on transport alone, as Government have now decided to purchase a trawler.

130. (3) *Petty Construction and Repairs.*—The office, salt stores and curing sheds in fish-curing yards both on the East Coast and the West Coast, at present consist of thatched buildings of a temporary nature. Due to their flimsy character and exposed position, they involve considerable annual recurring expenditure over petty repair and construction in maintaining them in order and there have been instances where in spite of repairs, storms and cyclones have damaged sheds and salt stored in the yard, entailing considerable loss. Further, the annual preparation of estimates and check-measurements and payments for repairs and petty construction involve on the part of the inspecting staff considerable clerical work and expenditure of time, to say nothing of the worry of looking after contractors. Such transactions also afford many opportunities for fraud. The system of annual repairs to the thatched sheds is an avoidable source of recurring expenditure; besides it involves appreciable waste of time, which could be more profitably employed by the officers in supervision. The reasons why the sheds have been kept in this temporary and clumsy condition are not far to seek. The fish-curing yards for the most part are built on the sandy beach where permanent buildings are difficult or costly to construct. For more reasons than one, they require to be shifted from place to place. There have been instances of wholesale migration of fishermen from one village to another, resulting in a desertion of ticket-holders from yards. Encroachment of the sea has often necessitated the removal of a

yard to a new site. A third reason is that, according to a long-standing practice, the curers have to purchase the site or build the sheds or at least pay back the expenditure on these for every yard that is newly built. It was not, therefore, possible to invest large sums which will be beyond the means of the fish-curers to repay. For the above reasons, I presume these buildings have continued during the last 50 years or more as temporary and clumsy thatched sheds. During the year, an attempt was made to see if an improvement on the present situation could not be effected. I append a type-design of a model shed and estimate* I have prepared for the East Coast yards. The shed is just as temporary and portable as the present thatched sheds being built of country wood and mud walls. But the difference is with reference to the roof, I have substituted asbestos sheeting in place of palm leaves. This permanent roofing material, unlike corrugated iron, is not affected by saline air from the sea or by the storage of salt within the sheds. It is a bad conductor of heat and cold. It is also easily transported, put on or dismantled and is non-inflammable, a very valuable character which the present sheds do not possess. While it has these several favourable qualities, it is somewhat costlier than thatched sheds; but in some places, such as the yards in the Pulicat lake, the asbestos model shed will probably be cheaper to construct. The estimated cost of the combined shed for salt storage and office, the living quarters of the peon and petty yard officer amounts to Rs. 590, whereas I understand that it has cost more than Rs. 600 to renew sheds in the fish-curing yards in the said area. The asbestos shed is far more elegant and will serve as a model to the fish-curers and fishermen amidst whom fish-curing yards are placed. This is not a negligible benefit which will accrue by the transformation of the thatched sheds, as the aim of the Fisheries Department includes the enlightenment and uplift of the fishing classes. The financial benefit in the course of a few years of such a transformation is obvious. Such sheds will not require repairs for five or six years, or more. The only repair that they will need at the end of this period would be the renewing of the wood work, the roofing being permanent material. Out of a provision of Rs. 25,000 for petty work and repairs in the budget for 1924-25 on a rough calculation, Rs. 7,000 in round figures has been spent on the repair and renewal of roofs for sheds. The whole of this

* See pages 73 and 74.

recurring expenditure over re-thatching of sheds could be saved with the gradual transformation that I propose to make in the form and construction of fish-curing yard sheds.

131. It has been suggested that economy might be effected by a retrenchment in the strength and salary of the fish-curing yard staff. I am wholly opposed to this view. A year's experience of fish-curing yards has shown the possibilities for fraud and corruption that exist, resulting in leakage of revenue and what is more, serious hardship to the fisher-folk. If a reduction in staff is to be effected, supervision and control will necessarily be less efficient with a corresponding increase of corruption. Even the existing staff is found in actual working to be insufficient and I had to propose in my letter Ref. No. 1790-F/24-1, dated 20th September 1924, a reorganization of the inspecting staff and a revision of their duties which was sanctioned by Government in their order No. 550, Development, dated 13th April 1925. I am yet to propose a revision of the subordinate staff with a view to increasing their efficiency, while not involving additional expenditure. I would deprecate all suggestion for economy on either staff or salaries. I can see but one end for such misguided economy which is gross leakage in salt revenue, besides all other attendant evils of blackmail and corruption which would justify the Government of India refusing to issue salt, duty free, for fish-curing purposes. This will defeat the very purpose for which the fish-curing yards exist.

RECEIPTS AND CHARGES.

132. The total expenditure over fish-curing yards and receipts during the fisheries year ending 31st June 1925, are shown in statement No. X, appended to this report. The total receipts including the value of salt on hand was Rs. 3,64,938 and the total expenditure Rs. 3,49,982 leaving a credit balance of Rs. 14,956. But for the unusual items of expenditure, the unsatisfactory nature of the sea-transport of salt to the West Coast, the bad fishing season and the fall in operations on the East Coast yards explained above, the transactions would have shown a much higher balance on the credit side as explained in paragraph 126 above.

DEEP-SEA FISHING EXPERIMENTS.

133. The most outstanding advance, in the sphere of operations of this department in the year under review, is the revival of the

proposal for the purchase of an up-to-date and well-equipped fishery vessel, which opens up immense possibilities for development hitherto denied to the department.

134. My proposals to purchase a Danish cutter for continuing the experiments in deep-sea fishing and a trawler to assist the cutter and for a more efficient and less expensive system of transport of salt by sea from Tuticorin to the Fish Curing Yards on the West Coast adverted to in paragraphs 76, 79 and 90 of last year's report were vetoed in G.Os. Nos. 1903 and 1904, Miscellaneous (Development), dated 5th November 1924, and the services of the Master Fisherman, Captain Cribb, who had been deputed to England in August 1924 were accordingly terminated.

135. The department owes the revival subsequently of the proposals for the purchase of a suitable vessel for deep-sea fishing and fisheries research to His Excellency the Governor, who was pleased to consider favourably the long-standing claims of the department in this direction. With the consent of Government the choice of a vessel best adapted for fishery work in Madras was fully considered and a ship of the trawler type was finally decided on as the best adapted for fishery work in Madras.

136. In view of the losses sustained in the trawling experiments conducted by the Bengal, Bombay and Ceylon Governments, Mr. Hornell advocated in 1921 the introduction of fishing by a Danish seine-net and motor-cutter as the most economic and suitable means for the development of the coastal fisheries of Madras. The advantages of the seine-net over trawl are mainly financial in nature. The cutter rigged seine-net boats are much smaller than trawlers, requiring far less in outlay and upkeep, but nevertheless match the trawler in their capacity for capture of fish. The fuel charges are considerably less as the seine-net boats are equipped with motor engines instead of steam. On the whole, therefore, the working of the seine-net boats is far cheaper than trawlers. Due to these financial advantages, the Danish method has within recent times replaced trawling to an appreciable extent in some of the fishing ports in England. But in India, conditions are different. We are yet to test the suitability of the seine-net as only one of the available modern methods of deep-sea fishing. The proposal is novel and entirely in the experimental stage where economy in working is not the main consideration, but should yield place to unfettered experiment till the potentialities of our deep-sea fisheries are ascertained and the most suitable methods

of exploitation determined. An European Master Fisherman brought up to fishing as his life work and with long experience of trawling, etc., is indispensable for the successful testing of the western methods of deep-sea fishing and he would need conveniences before he could successfully perform the experiments in the tropics. A trawler being a larger vessel will furnish the necessary conveniences better than a cutter, is more sea-worthy and capable of withstanding any monsoon weather in India. Besides, a motor-cutter will not subserve the other requirements of fishery work and if purchased could be used only for Danish seine netting. Whereas a trawler could conduct the seine-net fishing with the aid of a small auxiliary motor boat as is the case in Iceland, carry out trawling experiments if and when required with otter or beam trawl, test the possibilities of various types of fishing gear including the wide range of drift and other nets and in addition serve the various other purposes of the department. A trawler therefore is the best all round fishery vessel that could be purchased for pioneer work in India, although it may not be as cheap as a motor-cutter for seine netting. A further reason for the choice of a trawler is the present slump in the market which will enable Government to secure a good second-hand trawler for almost the same price as they will have to pay for a Danish cutter. With the many duties that the trawler will perform, I have hopes that the whole of its capital cost and upkeep will be paid for otherwise than by the proceeds of the catches made in deep-sea fishing experiments. The latter is a misleading test to be applied in ascertaining the success or otherwise of deep-sea fishing experiments, but has been necessarily applied unfortunately in the case of the experiments in Bengal, Bombay and Ceylon.

137. It has now been decided to re-entertain Captain Cribb as Assistant Director, Marine, and to purchase a good well found second-hand trawler to serve all the requirements of the Department such as economic salt transport to the West Coast, pearl bank inspection, the many duties connected with the conduct of the pearl fisheries, in addition to the exploitation of deep-sea fisheries and organized fishery research.

THE MARINE AQUARIUM.

138. During the year, the Marine Aquarium continued to be one of the foremost popular resorts in Madras. Due to the break-down of communications consequent on the floods early in the year, the

number of visitors dropped from 95,800 in the preceding year to 88,627. The record attendance, as usual, was on Kannu Pongal day when 4,032 people visited the institution, against 4,007 in 1923-24. Among the distinguished visitors during the year were Their Royal Highnesses the Prince and Princess of Connaught, His Excellency the Governor of Madras and Viscountess Goschen, Sir Heskett Bell (Governor of Mauritius) and the Hon'ble Minister for Development. Eight hundred and three copies of the English guide and 204 of the Tamil edition and 189 sets of the 1st series and 144 of the 2nd series of picture post-cards were sold. A third series of picture post-cards depicting six more of the beautiful coloured fish in the Aquarium will be issued shortly.

139. The receipts amounted to Rs. 8,144 as against Rs. 8,933 in the previous year. Out of the difference of Rs. 789, Rs. 700 is due from the defaulting lessee of the refreshment stall attached to the Aquarium against whom legal proceedings have been instituted. The Aquarium continued under my direct supervision and scrutiny, and the lines of retrenchment and economy adopted towards the middle of 1923-24 resulted, as anticipated, in a further reduction of about Rs. 1,000 in expenditure, which was only Rs. 6,355 in 1924-25 against Rs. 7,298 in the year previous. The expenditure includes the cost of stores for the laboratory, ordered from England at a cost of Rs. 618, which, if deducted, the retrenchment in expenditure this year will amount to Rs. 1,561. I am convinced that the future working of the Aquarium should not cost more, if due care and economy is exercised by the man in charge. I will frame proposals for the permanent reorganization of the Aquarium staff shortly. In spite of the fact that a sum of Rs. 700 still remains to be recovered from the contractor of the refreshment stall and a sum of Rs. 618 which represents capital expenditure incurred in connexion with research work has been included in the expenditure, the total receipts exceeded the total expenditure by Rs. 1,790, which compares favourably with the profits of the previous year, viz., Rs. 1,685.

140. The demand for the sale of canned goods at the Aquarium's on the increase, and the number of tins of all sorts sold in the year is 991 valued at Rs. 508, the highest on record.

141. The improvements effected during the year were: the addition of a large, attractive name-board with coloured electric bulbs, the exhibition for the first time of gold-fish and further improvements in aeration.

142. The proposed extension by the construction of larger tanks in the place of the old turtle tank, though very badly needed for the large fish in No. 10 tank, has not yet been sanctioned.

FISHERY RESEARCH.

143. The bulk of the research work done was conducted at the Calicut Research Station and as in the previous year consisted of the collection of data relating to the migration, food, growth and life history of the oil sardine (*Clupea longiceps*) and the Indian mackerel (*Scomber microlepidotus*). The methods were as follows:—

(1) Twice a week, unless debarred by unfavourable weather conditions, plankton (the minute animal and plant life in the sea which forms the food of sardine and mackerel) was collected. One collection was made in inshore and two in offshore water. Of the latter, one was a vertical and not a surface haul. The results of the examination were tabled in a statement from which the distribution and the abundance or paucity of the various organisms constituting the plankton may be noted at a glance. The form for tabulating the results of the examination of plankton was enlarged, remodelled and printed. This work went hand in hand with the microscopic examination of the stomach contents of sardine and mackerel. Beyond a rough classification done hitherto, a beginning was made in the intensive study of the more prominent groups which make up the bulk of the plankton. The work is difficult and highly technical, and I have had to give considerable assistance to the Research Assistants. All available literature in the Madras and Calcutta libraries was consulted and some books not available in India were purchased.

(2) A systematic examination of sardines and mackerel twice a week, whenever available, was done and the following facts—sex, condition of fat and gonads and rate of growth were recorded. Their scales were microscopically examined and the age markings, if present, were noted.

144. Mr. Moses, the Senior Research Assistant, attended the Indian Science Congress at Benares in January 1925 and read papers entitled "Colour variation of 2 spp. of Pterois" and "Insect pests and some South Indian beliefs" before the Zoological and Anthropological sections, respectively. Mr. Jayaram Nayudu made a month's tour along the Northern Coast as far as Gangoli in connexion with the mackerel investigation and collected valuable data from the books maintained in the various fish

curing yards. Much progress was made with the research on mackerel, as the fish was available throughout the season. In the year under review 3,560 fish were obtained and examined against 70 odd specimens. The results of the preliminary research done on mackerel will be soon ready for publication.

145. *Prawn Fishing*.—Stake net fishing for prawns in rivers in Malabar was prohibited by the Collector of Malabar in 1916 on the advice of Mr. H. C. Wilson, the then Piscicultural Expert to Government, to the effect that thousands of fish fry which would grow to full size will be prematurely captured and killed if prawn fishing by stake nets is allowed. There have been petitions from fishermen for permission to fish prawns from time to time. The Valans, a backward class of fishermen, who do prawn fishing in the Palayāngadi river, were reported to have been specially affected by this order. From recent enquiries made by the late and the present Assistant Directors (Coast), it was stated that prawns ascend these rivers at high tide and are caught in the stake nets during low tide and in the catches examined there were no young fry. With a view to decide finally whether the stake nets destroy immature fry, I have arranged for a detailed examination of the question. Regular hauls will be made by a stake net, once every fortnight, and the whole catch will be sent to the Research Station, Calicut, for examination and report.

MARINE BIOLOGICAL STATION AT KRUSADAI.

146. A detailed scheme for the establishment of a Marine Biological Station at Krusadai referred to in last year's report which will afford facilities for University work, was formulated by me in my letter No. 1904-B. 23-32, dated 16th January 1925. The allotment of funds for the initial outlay for furnishing and equipping the station is under the consideration of Government, as there is no provision for the expenditure either in the Department's Budget or that of the University. On the recommendation of the Committee who visited the Island last year, the University of Madras have now definitely offered to finance the station and voted the contribution of Rs. 2,000 annually demanded by the Development Department, for the provision of facilities to its students and professors.

147. The collections made at Krusadai Island have most of them been worked out by Dr. Gravely, Professors Parthasarathi Ayyangar and Ramunni Menon and myself. The results will be issued as one of the Madras Museum Bulletins under the

editorship of Dr. Gravely and will prove a valuable guide to students and workers at the proposed Krusadai Biological Station.

148. Though the station is not equipped or even furnished yet, there have been many requests from Professors and students at Madras and Bangalore, the officers of the Zoological Survey and the Superintendent of the Madras Museum, to occupy the station and make collections and observations. The station was occupied during the year by Professor Parthasarathi Ayyangar and a party of students of the Presidency College and by Dr. Chopra of the Zoological Survey.

BIOLOGICAL SPECIMEN AND OYSTER SUPPLY.

149. *General.*—The amalgamation of the oyster and biological specimen supply sections, with the consequent reduction of staff, worked satisfactorily during the year. As a result of further economies in expenditure and greatly enlarged sales, the oyster supply section brought in a huge profit of Rs. 1,274 against Rs. 332 in 1923-24. The increased profit on oysters was however counter-balanced by loss in the Biological Specimen Supply. Due to a fall in the number of orders received from Colleges the biological supply section worked at a loss of Rs. 1,391, against a profit of Rs. 435 in the year previous. The combined sections therefore incurred a small loss of Rs. 117 in the year which, in view of the heavy losses sustained by both the sections in past years, when they were independent of each other, marks a great improvement in the financial position of the two sections.

Year.	Oysters.	Biological specimens.	Total.
1921-22	... - 961	- 807	- 1,768
1922-23	... - 491	- 681	- 1,172
1923-24	... + 332	+ 435	+ 767
1924-25	... + 1,274	- 1,391	- 117
	+ 154	- 2,444	- 2,290

(The sign - means loss and + gain.)

The amalgamation has therefore fulfilled my anticipations in minimizing loss and in rendering the combined section more or less self-supporting.

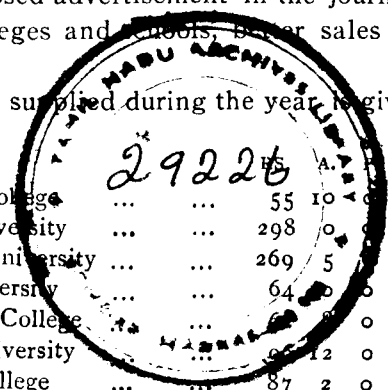
BIOLOGICAL SPECIMEN SUPPLY.

150. During the year the value of specimens sent out dropped to Rs. 2,580 from Rs. 5,393 in 1923-24. This large decrease was due

to the fact that the colleges in Northern India, our best customers, did not indent for dissection specimens to the extent they did in the previous year. The reason apparently is a change in the curricula of studies in those institutions in alternate years.

151. With a view to dispose of the large stock of specimens now on hand, the various Indian Universities and their affiliated colleges are being approached. It is also proposed to advertise the supply of specimens in some of the educational journals such as "The Educational Review" and "Modern Review." The several important high schools in the Presidency have been addressed as to the desirability of equipping their museums with shell and crab wall-cases specially designed for schools. Till now only 25 cases have been sold to schools, though there are about 500 Secondary schools and 274 High schools in the Presidency for boys and girls. With the proposed advertisement in the journals and the circulars issued to colleges and schools, better sales are expected next year.

152. A list of the institutions supplied during the year is given below:—



Agra ...	St. John's College	55	10	0
Aligarh ...	Muslim University	298	0	0
Allahabad ...	Allahabad University	269	5	0
Benares ...	Hindu University	64	0	0
Bombay ...	St. Xavier's College	...	...	0
Calcutta ...	Calcutta University	...	12	0
Dharwar ...	Karnatak College	87	2	0
Gujranwala ...	Gurumanak Khalsa College	196	14	0
Karachi ...	Dayaram Sethmal Sind College	189	10	0
Lucknow ...	Isabella Thoburn College	34	0	0
Nagpur ...	Hislop College	81	10	0
Rangoon ...	Judson College	29	10	0
Do. ...	University College	342	6	0
Rawalpindi ...	Gordon College	198	8	0
Anantapur ...	Ceded Districts College	161	8	0
Bangalore ...	Central College...	119	12	0
Madras ...	Presidency College	45	12	0
Trivandrum ...	H.H. The Maharaja's College of Science	80	12	0
Vizagapatam ...	Mrs. A. V. N. College	53	8	0
Panruti ...	Board High School	43	8	0
Bangalore ...	United Service Club (turtle)	17	8	0
Brighton ...	Mr. J. Gordon Dalgliesh	50	14	0
	Total	2,579	11	0

K-22-1926-25

The expenditure and receipts over biological specimen supply during the year under report were:—

<i>Expenditure.</i>	RS.	A.	P.
Salaries of establishment (exclusive of 25 per cent of the senior operator's pay which is debited to oyster supply)	2,607	0	0
Travelling allowance	103	2	0
Collections, materials and miscellaneous charges, including cost price of jars sent out with specimens ...	1,260	14	0
	3,971	0	0
<i>Revenue.</i>			
Value of zoological specimens sent out	2,579	11	0
Loss on working	1,391	5	0

153. *Named collection at Ennur.*—The identification of marine biological specimens and the formation of a reference collection at Ennur were started by me last year, to enable the Research Assistant to name the specimens sent out to colleges and to help the research work of the department generally. During the year a collection of crabs from Krusadai Island was kindly identified by Dr. Gravely, the collection of cuttle-fish at Ennur was named by Mr. Winkworth of the Royal Society, a specialist who visited Madras last February, and the hermit crabs were worked out by me. The named specimens were added to the type collection at Ennur with suitable printed labels. Needless to say, this work which has been neglected in the past will greatly add to the value of our biological specimen supply, besides helping the research work of the department as a whole. Prior to 1923-24 there were no named specimens at all in any of the collections made by this department, from time to time, rendering the task of checking the accuracy of reports made thereon well nigh impossible. Specimens so valuable in themselves and which would have been the best proof of the accuracy and scientific value of reports published have been irrecoverably lost. One has to undertake the collection, preservation and identification of specimens all over again, before the value and extent of work

already done in the marine biological section could be ascertained and any further research could be profitably planned or undertaken. This is my aim in the formation of the named collection at Ennur, with dates and locality of each recorded with the specimens.

OYSTER SUPPLY.

154. The year witnessed great prosperity in oyster operations, resulting in record sales and profit. The work had to be further reorganized during the year. The new oysters grown at Pulicat since 1922 season were of unusually large size and in prime condition. The Waltair Club preferred Pulicat oysters at Rs. 21 a thousand to Sonapur oysters at Rs. 12 a thousand as the latter were small in size. But the stock available at Pulicat was necessarily limited, as the farm has not had time yet to recover completely from the destruction caused by a shell contractor in 1922. The almost inexhaustible stock of oysters that were once there are no longer available and special efforts at restocking and other cultural methods are required urgently, to render the beds productive next season, and I am not without apprehension regarding next year's supply. The method followed during the year under review was to get 8,000 oysters once a week for the heavy week-end supplies from Pulicat, cleaned and bagged in hundreds or couple of hundreds and sent in hired boats to Ennur, whence they were despatched by rail. For sudden demands and small orders during week days, a stock of Ennur oysters was kept ready at Ennur, subjecting it as usual to a week to ten days hygienic treatment before sale. This procedure has resulted in a considerable saving. In previous years though the orders on week days were only for 50 or 100 oysters, a man came all the way from Pulicat for booking the parcel at the railway station at Ennur, paying boat hire to and fro, and receiving batta. The other economies effected in expenses have been so considerable that the actual cost per 1,000 oysters at Ennur now comes to only Rs. 4-1-5 against Rs. 4-15-0 in the previous year and Rs. 7-12-4 in 1922-23.

155. The 1924 season as stated in last year's report continued till 27th September 1924, and the present season commenced on 21st February 1925 and continued till 24th August 1925, when the oysters at Pulicat were exhausted and floods resulting from early rains prevented collection of oysters at Ennur. During the year under report, 256,810 oysters, the highest on record, were sold against 203,592 during the year previous, resulting in a net profit

of Rs. 1,274, as shown below, against the profit of Rs. 332 during the preceding year.

<i>Receipts.</i>				RS.	A.	P.
Sale-proceeds of oysters	...	...	...	3,549	5	0
Do. oyster grit	...	...	...	7	8	0
				3,556	13	0
<i>Expenditure.</i>						
Pay of establishment 25 per cent of the pay of						
Laboratory assistant	...	...	...	208	15	0
Labour, forwarding charges and miscellaneous						
charges	...	...	...	2,073	7	7
				2,282	6	7
Net profit	...			1,274	6	5

156. *Experiments and research.*—As a result of the investigations made in 1924 coupled with an inspection made in May 1925, I am satisfied that the oyster beds at Patisonapur are well worth conserving and developing, especially as our Pulicat beds are not so productive as before. But the oysters available at Sonapur are of small size often less than half the size of our average Pulicat oysters, but this I attribute to the drain caused by the reckless oyster fishing now prevalent at Sonapur. In the best surroundings, the oysters require 18 months to 2 years to reach marketable size; here, they are fished out every season and necessarily the oysters are small, being hardly a year old. Further the shell contractors, as at Pulicat, are ruthless in their search for shells and have been carting off the hard calcareous rock consisting of old comminuted oyster shells and which forms the oyster beds. If left unchecked, such destruction will exterminate the valuable oyster fishery of this swamp at no distant date. Proposals for reserving some of these beds against indiscriminate fishing and destruction by shell contractors will be submitted to Government, as a Part II scheme for inclusion in the Budget Estimate for 1926-27.

157. The back-water at Ennur I find is of doubtful purity and subject to great fluctuations in temperature and salinity. Only on the few occasions when the bar is cut open is the salinity sufficiently high and water free from pollution. Also, the banks are thickly populated and the shore is far from being sanitary especially near the fishing huts. I am, therefore, planning to construct a suitable conditioning tank for the hygienic treatment of

oysters in the Ennur station compound, protected by a thatched roof from excessive heat and supplied with fresh sea water from the sea by a pipe line taken beyond the surf of the Beach.

158. *Shell grit.*—The question of utilizing the dead oyster shells ground into grit of various sizes for poultry feeding was taken up seriously this year and samples and literature, etc., are being obtained. Shell grit resulting from experiments conducted at Ennur was sold for Rs. 7-8 during the year.

SOCIO-ECONOMIC SECTION.

EDUCATION.

159. *Fisheries Training Institute—Pupil teachers.*—The number on the rolls was 33 of whom 25 belonged to the fishing community; of the rest two were Muhammadans, three Christians and three Hindus of non-fisherman classes. Of the three Hindus one was a Thiyya, one a Chaliyan (Weaver) and the last a Thattan (Goldsmith) by caste. Five students with stipends from the Fisheries Department were undergoing their preliminary training, in the Government Training school at Mangalore, preparatory to their training in the Fisheries Training Institute. All these were fishermen by caste. Among those admitted in the Institute, during the year under report, were two women, one a Christian and the other a Mukkuva. There is a large proportion of girls in many of the Fisheries Elementary Schools and hence the employment of school mistresses in some of the Fisheries schools has been found necessary. Mistresses trained in the ordinary training schools are not qualified for teaching in Fisheries schools, as the special training that the fisher-girl needs is peculiar to that class. As the men toil at sea, their work generally ceases with the landing of fish captured. The women-folk take up the rest of the work connected with the disposal of the catch. It is they who carry the fish to markets and sell them and when catches exceed demand, it is largely they who resort to yards and cure the fish. Domestic finance is therefore entirely in their hands. If the fisher classes are to be taught the advantages of sanitation, thrift, co-operation, petty banking and account-keeping which are likely to remedy the impecunious and thriftless habits of the class, the women, even more than the men, require to be suitably educated. The Fisheries Training Institute should therefore aim at training women teachers in fish-curing technique, methods of marketing or otherwise disposing of the catch, principles of co-operation and elements of banking and account-keeping.

Further, net-making—an important industry among fisherfolk—frequently falls to the lot of women and should be taught by women teachers to girls in Fisheries elementary schools. Two women pupil teachers were therefore taken into the Institute for the first time in the year under report. As at present staffed and equipped, the Institute cannot undertake the complete training of women teachers in needlework and callisthenics which are ordinarily taught in training schools for women. Till the number of women pupil teachers taken for training is sufficiently large, no special arrangements for teaching these subjects in the Fisheries Training Institute are called for, and I am of opinion that perhaps the best course would be to permit selected candidates to undergo a year's course or so in the ordinary training schools, with stipends, before they come to the Fisheries Training Institute for completing their training. This is an important matter and the scheme is only at an experimental stage.

160. *Staff.*—The school staff was strengthened during the year by the appointment of a Drill Master and Clerk which post was sanctioned by Government during the year. A third Assistant who was untrained was sent for training to the Government Training School at Tellicherry. Mr. Fyfe, the Inspector of Industrial Schools, having condemned the work of the previous Carpentry Instructor, his services were dispensed with and a new man was appointed in his place.

161. *Building and Apparatus.*—Books to the value of nearly Rs. 150 and apparatus for teaching elementary science to the value of about Rs. 450 have been purchased. One more canoe to permit of more pupil teachers going to sea every day was provided.

162. *Work.*—The Institute was inspected by the District Educational Officer, who has expressed himself as satisfied with the progress made, and the carpentry work was inspected by the Inspector of Industrial schools who has also been satisfied with the work of the new Carpentry Instructor. A new three-year course in carpentry has been prepared by the Instructor and approved by Mr. Fyfe. The Director of Industries has been addressed to include the carpentry section of the Institute in the list of schools inspected by Mr. Fyfe. Nine students appeared for the final examination, of whom six have been declared to have passed by the Board of Examiners, one being placed in the first class. The students went out as usual on excursion to Tanur, Chaliyam and South Kanara Coast, but the time spent at Tanur

and Chaliyam was less than in previous years, because the financial provision for travelling allowances to pupil teachers was not sufficient for longer excursions. The students again took part in the Grigg Memorial Sports and won two medals. The co-operative and literary societies did active work during the year. Practical work at sea was done more thoroughly this year, as a third boat was provided, in addition to the existing two boats as stated above. The fish caught and the carpentry articles made realized Rs. 258-0-9 and Rs. 14-11-6 against Rs. 89-3-0 and Rs. 13-14-6 respectively, in the previous year.

163. The Scout training which had been interrupted by the transfer of the Scout Master to Kaipamangalam School was revived at the end of the year under report, with a new Scout Master.

164. *Village schools.*—The number of schools at the beginning of the year was 27. Five new schools were opened at South Nattika, Valiangode, Parappanangadi and Quilandi, in Malabar; and at Kumbla in South Kanara. Of these Parappanangadi and Kumbla schools are for Muhammadan children. The night school at Azhikode was closed as its working was not satisfactory, and its funds were utilized for opening the night school at Parappanangadi. The number of schools at the end of the year was thus 32. The number of pupils attending the schools is 2,450 against 2,001 in the previous year. The number of girls attending the schools increased from 504 to 691 and the number of teachers employed was 84 against 69 in the previous year; the number of fishery trained teachers was 37 on 30th June 1925, against 29 on 30th June 1924. The increase in the strength of the schools testifies to the interest evinced by fishermen in the matter of education. The schools staffed with the fishery-trained teachers generally show a decided improvement. We have not been in a position to get the full complement of teachers trained at the Fisheries Training Institute, but this will be done in the course of the next few years.

TEMPERANCE.

165. The Young Men's Association in the Ponnani taluk referred to in the previous year's report was started during the year and worked satisfactorily along with another organized at Talikulam. The teachers who are mostly fishery-trained take a keen interest in their working. There is a teachers' association and a club in Ponnani. Meetings are held in different schools in rotation. When they meet, the teachers board and lodge in the same house without distinction of caste. The villagers of Kottakadapuram

readily subscribed funds to help a poor student for his further study in the local high school, which they have now discontinued, as the student is holding a scholarship. The ideals set up by Sir F. A. Nicholson in inaugurating the scheme for Fishery education in 1919 have been realized, at least in part, and the great socio-economic progress of the community is due almost entirely to the spread of education.

166. For want of support the idea of putting up a temperance hall at Malpe has had to be abandoned by the owner of the school building. There is a liquor shop at some short distance from and behind the school, and the school compound was used as a foot-path by those patronizing the shop. The Collector of South Kanara to whom a representation was made suggested the putting up of a fence round the school compound, which has been done.

CO-OPERATION.

167. It is a well-known fact that although several credit societies on a limited liability basis have been started among fishermen, they do not help the actual fishermen to the extent desired. There are many middlemen money-lenders who deal in fish in these societies, and theoretically it is the middleman that has credit, and the security offered by him to the bank is accepted, but the fish catcher does not command credit and therefore goes to the wall. The few actual fishermen in these societies pay for their shares in instalments during the fishing months and borrow from the societies up to the limit of the subscribed share capital when no fishing can be had. For the purchase of boats and nets they have to borrow at ruinous rates of interest, from middlemen and money-lenders who during the fishing season are ready on the sea-shore to make their levy. The fish is sold by the fishermen at the price dictated by the creditor. The first effort to wean the fishermen from this economic thralldom was made during the year. Through the instrumentality of the Assistant Director (Coast) a resolution was passed at the Malabar District Co-operative Conference held at Cannanore, in December 1924, recommending that the District Co-operative Bank should advance loans to co-operative societies of actual fishermen on the security of their boats and nets. Though there was the risk of the boats getting sunk and nets lost, the conference felt that the risk was worth taking, but the bank rejected the recommendation though it claims among its directors two prominent members of the fishermen community.

168. *Co-operative societies.*—The year under report has been the third bad fishing season in succession and the worst of the lot, and consequently the working of co-operative societies has not been satisfactory. Two societies were organized: one is the result of bifurcation of an old one, and the other is a new one. The Velian-gode Society which was started in 1918 has ceased to function as the account books were lost by the President, and the matter is being investigated by the Assistant Registrar of Co-operative Societies. The Tanur Kadapuram Society started in 1915 was found to have been mismanaged. The Secretary had misappropriated a large sum of money for which he was prosecuted and sentenced to six months' rigorous imprisonment.

169. The particulars of the transaction of Fishermen co-operative societies are given below:—

Particulars.	1923-24.	1924-25.
Male members	2,697	2,632
Female members	335	249
Total number of members	3,032	2,881
Total number of shares	4,093	3,945
Paid-up share capital	Rs. 81,670	Rs. 73,576
Total of loans disbursed	„ 3,11,392	„ 3,11,377
Total of loans for payment of prior debts	„ 75,499	„ 81,573
Total of loans for industrial use	„ 91,662	„ 51,618
Total of loans received from Central Bank	„ 10,802	„ 13,397

170. In reviewing the Fisheries Administration Report for 1923-24, the Government expressed the opinion that other causes besides the bad season contributed to the unsatisfactory state of fishermen societies. The contributory causes have now been investigated. The poor fishing season was the chief cause for their unsatisfactory working during the year under report as in the previous year. Even if the season was good, the societies perhaps would not have worked satisfactorily as their organization and control leave much that is to be desired. Fishermen societies specially require intensive supervision, and collections should be made immediately the members come in possession of money. Inspectors of co-operative societies and supervisors of unions have no facilities to make frequent visits or prolonged halts in fishing villages, and the money that can be had for the asking at the

proper hour is squandered after an interval. In consultation with the Assistant Registrar of Co-operative Societies, South Kanara, group examiners have been appointed for the district, each group examiner being in charge of three or four co-operative societies. The system has just been introduced and it is too early to judge its results. A similar proposal has been made for Malabar, but it has not been brought into effect. When group examiners are appointed, these societies will be disaffiliated from Unions. It is proposed to distribute the supervision funds among these group examiners, but the amount that each will get is so small that it is doubtful whether the group examiners will have sufficient incentive to improve the state of these co-operative societies. At present this is the only method possible. If, however, my proposals for the reorganization of the subordinate executive staff of the fish-curing yards which will be submitted to Government shortly are sanctioned, the itinerant fishery officers with limited beats, proposed therein, will have better facilities to exercise the close supervision needed and may replace the group examiners and save, incidentally, the supervision funds for the societies.

171. The usual statements are appended.

I have the honour to be,

Sir,

Your most obedient servant,

B. SUNDARA RAJ,

Director of Fisheries.

STATEMENT I.—Staff of the Fisheries Department, 1924-25.

Post.	Incumbent.	Period.
Director	Dr. B. Sundara Raj ...	1st July 1924 to 30th June 1925.
Assistant Director (Coast) ...	M.R.Ry. U. Karunakara Menon Avargal.	Do.
Assistant Director (Inland).	M.R.Ry. C. G. Chakrapani Ayyangar Avargal.	Do.
Superintendent of Pearl and Chank Fisheries.	M.R.Ry. Rao Sahib J. A. Fernandez Avargal.	Do.
Master Fisherman	Captain T. G. Cribb ...	1st July to 14th October 1924.

STATEMENT II.—Summary of Expenditure and Revenue of the Fisheries Department for 1924-25.

Particulars.	Expenditure.			Revenue.			Difference.			
	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	
I. Direction	28,343	11	5	1	1	0	--	28,342	10	5
II. Superintendent, Pearl and Chank Fisheries.	50,179	13	3	54,023	9	11	--	3,843	12	8
Deep Sea Fishing ...	4,103	11	9				--	4,103	11	9
III. Assistant Director (Coast)	7,435	7	10	175	0	0	--	7,260	7	10
IV. Oil and Guano Industry.	1,952	11	0				--	1,952	11	0
V. Tanur Station	17,265	7	3	13,502	14	0	--	3,762	9	3
VI. Training Institute, Calicut.	14,703	9	7	344	0	0	--	14,359	9	7
VII. Schools for Fishermen .	26,067	11	9	9	9	0	--	26,058	2	9
VIII. Socio economic work ...	1,573	3	0				--	1,573	3	0
IX. Assistant Director (Inland).	98,087	12	9	1,09,466	12	0	--	11,378	15	3
X. Oyster Farm, Pulicat ...	2,282	6	7	3,556	13	0	--	1,274	6	5
XI. Aquarium	6,354	8	7	8,144	7	6	--	1,789	14	11
XII. Marine Biological Sec- tion.	11,818	5	9	2,709	11	0	--	9,108	10	9
XIII. Fish-curing yards ...	3,49,982	5	1	3,64,938	2	7	--	14,955	13	6
Government Cannery, Chaliyam (for year ending 31st March 1925).	33,884	11	10	26,452	13	4	--	7,431	14	6
Total	6,54,035	9	5	5,83,324	13	4	--	70,710	12	1

An Elementary School for Fisher-children at Uppur, South Kanara, started by the Fisheries Department in 1920.



Fig. 1.—Before 1925.

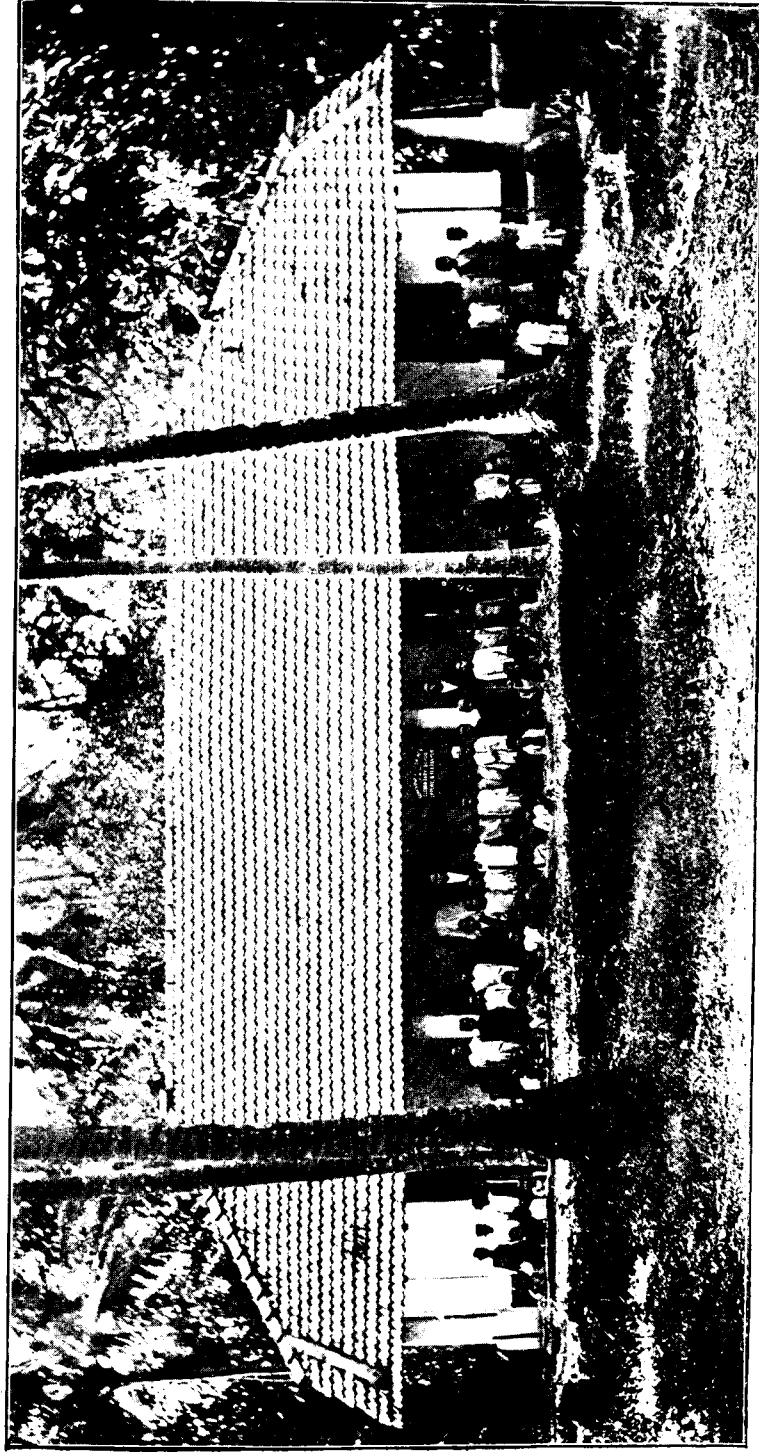


Fig. 2.—After 1925.

STATEMENT V.—Details of Revenue.

Amount.	
RS.	A. P.
IX. Assistant Director (Inland)—	
(1) Rentals from Cauvery, Coleroon, general tanks and canals	94,645 5 4
(2) Rentals from the tanks in the Chingleput district	2,203 0 4
(3) Rentals from the tanks in the Nellore district	10,194 5 10
(4) Receipts from the fish farms by sales of fish, grass, etc.	2,336 0 6
(5) Miscellaneous receipts—	
Sale of Vallur shed, etc.	88 0 0
1,09,466 12 0	
XII. Marine Biological Section—	
(1) Revenue from Zoological section	2,579 11 0
(2) Revenue from Research station, Calicut	70 0 0
(3) Rent realized from Ennur Bungalow	60 0 0
2,709 11 0	

Amount.	
RS.	A. P.
I. Direction—	
Miscellaneous receipts	1 1 0
II. Superintendent, Pearl and Chank Fisheries—	
(1) Revenue from all chank fisheries including Beche-de-mer fishery as per statement VI...	38,023 8 8
(2) Revenue from Pearl Fishery Section as per statement VII...	3,561 14 6
(3) Decree amount realized from Messrs. J. B. Dutt & Sons of Dacca towards godown rent and interest	12,438 2 9
Rs. 54,023 9 11	
III. Assistant Director (Coast)—	
Sale-proceeds of Machuwa	175 0 0

STATEMENT VI.—Profit and Loss Account of the Chank and Beche-de-mer Fisheries for the season 1924-25.

Expenditure.	Amount.			Revenue.	Amount.		
	RS.	A.	P.		RS.	A.	P.
Chank fisheries—				Value of Chanks fished and other receipts—			
Tinnevelly	13,721	6	1	Tinnevelly	22,722	6	7
Rāmnād	9,712	6	1	Rāmnād	10,062	4	9
Sivaganga	207	6	0	Sivaganga	73	13	4
Beche-de-mer fishery	619	10	11	Beche-de-mer fishery.	700	0	0
Twelfth year's proportion of the total consideration paid in 1913-14 for a 15 years' lease of the Rāmnād fishery	4,000	0	0	Chank rentals realized—			
Supervision charges, viz., 50 per cent of pay and travelling allowance of the Superintendent, Pearl and Chank Fisheries	2,036	13	6	Tanjore district	2,750	0	
Balance of Profit	20,164	0	10	South Arcot district	955	0	0
Total	50,461	11	5	Chingleput and Nellore districts	760	0	0
				Decree amount realized from Messrs. J. B. Dutt & Sons of Dacca	12,438	2	9
				Total	50,461	11	5

STATEMENT VII.—Profit and Loss Account of the Pearl Fishery section for the season 1924-25.

Expenditure.	Amount.			Revenue.	Amount.		
	RS.	A.	P.		RS.	A.	P.
Pearl Fisheries—				Receipts from Krusadai Islands	160	0	0
Examination of Pearl Banks	3,282	7	2	Receipts from sale of kerosene oil cases, tins, etc.	80	4	10
Pamban Pearl Farm	324	6	0	Cost of stores supplied to Revenue department for Laccadive trip	247	9	8
Contingencies	1,000	0	0	Hire of Lady Nicholson for the Laccadive trip	3,074	0	0
Running expenses of Lady Nicholson	6,159	13	1	Loss	16,320	4	2
Running expenses of Leverett	1,122	7	6				
Contingencies	96	1	2				
Pay and travelling allowance of crew "Lady Nicholson"	3,574	14	0				
Pay and travelling allowance of crew "Leverett"	457	14	0				
Pay and travelling allowance of Pearl Fishery establishment	2,845	13	0				
Supervision charges, viz., 25 per cent of pay and travelling allowance of the Superintendent, Pearl and Chank Fisheries	1,018	6	9				
Total	19,882	2	8	Total	10,882	2	8

STATEMENT III.—Details of Expenditure.

Particulars.	Salaries.	Establishment.	Allowances.	Supplies and services.	Contingencies.	Total.
I. Direction	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
II. Superintendent, Pearl and Chank Fisheries.	(1) 8,317 8 0 (2) 2,462 7 9	12,389 2 0 12,286 11 0	3,838 15 0 (10) 1,534 12 6	...	3,798 2 5 1,840 9 1	28,343 11 5 50,179 13 3
III. Deep Sea Fishing	1,980 15 0	447 9 0	1,171 3 0	304 0 9	...	4,103 11 9
IV. Assistant Director (Coast)	(3) 2,682 3 3	2,109 6 0	1,426 13 0	...	1,157 1 7	7,435 7 10
V. Oil and Guano Industry	...	1,044 3 0	968 8 0	...	...	1,932 11 0
VI. Tanur Station	(4) 383 2 9	(6) 1,199 9 6	209 2 0	14,408 15 6	1,064 9 6	17,265 7 3
VII. Training Institute	...	5,697 15 0	332 10 0	8,673 0 7	...	14,703 9 7
VIII. Schools for fishermen	...	26,867 13 0	332 9 0	4,027 7 2	839 14 7	26,067 11 9
VIII. Socio-economic work	...	1,075 14 0	497 5 0	...	...	1,573 3 0
IX. Assistant Director (Inland)	2,837 8 0	11,447 1 0	6,207 11 0	76,642 1 3	893 7 6	98,087 12 9
X. Oyster Farm, Pulicat	...	(7) 208 15 0	...	2,073 7 7	...	2,282 6 7
XI. Aquarium	...	1,969 13 0	2 0 0	4,362 11 7	...	6,354 8 7
XII. Marine Biological Section— Zoological supply section.	...	7(a) 2,607 0 0	103 2 0	661 8 1	599 5 11	3,971 0 0
Research work	...	(8) 6,232 4 6	363 14 0	824 5 10	426 13 5	7,847 5 9
XIII. Fish-curing yards	(a) 820 13 3 (5) 432 8 0	(9) 84,577 4 6 3,833 0 0	(11) 6,073 14 6 101 5 0	2,58,510 4 10 26,823 8 10	...	3,49,982 5 1
Cannery (for year ending 31st March 1925).	...	...	...	...	2,694 6 0	33,884 11 10
Total	19,917 2 0	1,68,053 8 6	23,163 12 0	4,29,386 12 11	13,314 6 0	6,54,035 9 5

- (1) Excludes Rs. 432-8-0 debited to Cannery.
 (2) Excludes 25 per cent of the pay of the Superintendent, Pearl and Chank Fisheries, debited to Fish-curing yards.
 (3) Excludes 12½ per cent of the pay of the Assistant Director (Coast), debited to Tanur Station.
 (4) Represents 12½ per cent of the pay of the Assistant Director (Coast).
 (4) (a) Represents 25 per cent of the pay of the Superintendent, Pearl and Chank Fisheries.
 (5) Represents 5 per cent of the pay of the Director from 1st April 1924 to 31st March 1925.
 (6) Excludes 50 per cent of the pay of the permanent Establishment debited to "Research."
 (7) Represents 25 per cent of the pay of the Laboratory Assistant.

- (7) (a) Excludes 25 per cent of the pay of the Laboratory Assistant, debited to Oyster Farm, Pulicat.
 (8) Includes 50 per cent of the pay of the Tanur establishment and 50 per cent of the pay of the Inspector of Fisheries, Vizagapatam.
 (9) Excludes 50 per cent of the pay of the Inspector of Fisheries, Vizagapatam, debited to Research and includes Rs. 7,304-13-0 for pensionary contribution in respect of permanent establishment.
 (10) Excludes 25 per cent of the Travelling Allowance of the Superintendent, Pearl and Chank Fisheries, debited to Fish-curing yards.
 (11) Includes 25 per cent of the Travelling Allowance of the Superintendent, Pearl and Chank Fisheries.

STATEMENT IV.—Details of Supplies and Services.

I. Superintendent, Pearl and Chank Fisheries—	Amount. RS. A. P.	IX. Assistant Director (Inland)—	Amount. RS. A. P.
A. Chank fisheries—		A. Tank stocking—	
(1) Rannad fisheries	9,772 6 10	(1) Compensation to District Boards	62,197 11 0
(2) Tinnevely fisheries	6,826 15 4	(2) Stocking of tanks	892 8 9
(3) Beche-de-mer fisheries	619 10 11	(3) Chingleput and Nellore tank stocking scheme	1,786 6 3
B. Pearl fisheries—		B. Other works—	
(1) Examination of pearl banks	3,282 7 2	(1) Sunkesula fish farm	4,732 3 1
(2) Pamban pearl farm	324 6 0	(2) Ippur fish farm	1,333 4 0
C. Fisheries' Vessels—		(3) Powder factory farm	503 15 9
(1) Lady Nicholson	6,159 13 1	(4) Chingleput Fort moat farm	404 6 1
(2) Leverett	2,806 2 8	(5) Vellore Fort moat farm	1,627 4 0
(3) Sutherland	1,246 15 10	(6) Mopad fish farm	2,501 5 10
(4) Pearl	1,016 7 1	(7) House boat maintenance	184 3 0
	32,055 4 11	(8) Nallamalais scheme	392 3 0
		(9) Hilsa Hatchery	86 10 0
			Rs. 76,642 1 3
Deep-sea fishing—			
Running expenses of Sea Scout	504 0 9		
III. Fish-curing yards—			
(1) Petty Construction and Repairs	13,491 15 4		
(2) Purchase of salt	29,502 3 2		
(3) Export and Import of salt	55,206 15 8		
(4) Charges for conveyance of salt to fish curing yards	28,199 6 6		
(5) Clothing and Equipment	537 8 0		
(6) Other contingencies	23,635 13 7		
(7) Opening stock of salt on hand on 1st July 1924. 158,803 mds. at 0-10-10-5 per maund as per method of calculation adopted by Messrs. Fraser & Ross	1,07,936 6 7		
	2,58,510 4 10		

STATEMENT VIII.—Trading Account of the Experimental Station, Tanur, for the year ending 30th June 1925.

	Amount.	Amount.	Amount.
	RS. A. P.	RS. A. P.	RS. A. P.
To opening stock—			10,645 3 9
Cured fish	366 8 0		
Oil and Guano	865 14 0		
Fish-meal	1,157 8 0		
Coconuts	28 8 8		
		2,418 6 8	
Purchases—			1,315 9 3
Fish-oil outside purchase		1,839 9 11	
Manufacturing cost from manu- facturing account		6,776 10 0	
Gross profit transferred to Profit and Loss Account		1,126 2 5	
		12,160 13 0	
			12,160 13 0
By sales—Oil, Guano, Fish-meal, etc....			
Closing stock—			
Cured fish		614 6 11	
Fish-meal		582 12 4	
Oil and Guano		293 15 0	
Service labels		24 7 0	
			1,515 9 3

STATEMENT IX.—Profit and Loss Account of the Tanur Experimental Station for the year ending 30th June 1925.

	Amount.	Amount.	Amount.
	RS. A. P.	RS. A. P.	RS. A. P.
To Rents	24 5 8		
Postages	445 0 0		
Salaries... ..	662 1 6		
Packing	673 6 7		
Railway freight	497 6 0		
Petty coolie	191 8 10		
Travelling allowance	209 2 0		
Repairs... ..	130 10 2		
Coconut plantation charges	80 12 6		
Advertisement charges	207 4 0		
Direction charges	383 2 9		
Boiler inspection fees... ..	35 0 0		
Exhibition charges	25 0 0		
Books and maps	10 12 0		
Miscellaneous	90 10 6		
Interest on capital	291 15 0		
Experiments	1,085 11 2		
		5,043 12 8	
Depreciation—			
Buildings and sheds	511 1 2		
Plant and machinery, etc.	424 9 7		
		935 10 9	
Reserve for bad and doubtful debts		251 5 3	
			6,230 12 8
			6,230 12 8
Particulars,			
By Rent Cannanore Yard		48 11 4	
Receipts collected and not remitted.		23 2 0	
Rent collected and not remitted		27 8 0	
Rent outstanding		41 12 0	
			141 1 4
Sale proceeds of coconuts			818 1 6
Other miscellaneous receipts... ..			382 14 2
Gross profit from Trading account			1,126 2 5
Net Loss			3,762 9 3

STATEMENT X.—Profit and Loss Account of the fish-curing yards for the year ending 30th June 1925.

Expenditure.	Amount.	Receipts.	Amount.
	RS. A. P.		RS. A. P.
To opening stock of salt on hand on 1st July 1924—158,803 maunds at Re 0-10-10 ⁵ per maund as per method of calculation adopted by Messrs. Fraser & Ross.	1,07,936 6 7	By Sale proceeds of salt and other miscellaneous receipts.	2,59,937 11 5†
„ Pay of establishment ...	76,788 5 0*	„ Value of 151,352 maunds of salt in stock at the yards on 1st July 1925 (calculated at Re 0-11-1 ² a maund).	1,05,000 7 2
„ Pensionary contribution in respect of permanent establishment.	7,304 13 0		
„ Travelling allowance ...	5,876 5 0		
„ Overtime fees ...	484 2 6		
<i>Contingencies.</i>			
To Petty construction and repairs.	13,491 15 4†		
„ Purchase of salt ...	29,502 3 2		
„ Charges for conveyance of salt.	28,199 6 6		
„ Export and import of salt.	55,206 15 8		
„ Other contingencies ...	23,635 13 7		
„ Clothing and equipment ..	537 8 0		
„ Supervision charges—25 per cent of the pay and travelling allowance of the Superintendent, Pearl and Chank Fisheries.	1,018 6 9		
Net profit ...	14,955 13 6		
	3,64,938 2 7		3,64,938 2 7

* Excludes Rs. 720 being 50 per cent of the Pay of I.F., Vizagapatam, debited to research.

† Excludes Rs. 6,450 advances made to curers for construction of sheds and Rs. 14,642 spent on Kizhur yard not yet opened.

‡ Excludes Rs. 3,262 cess collections during the year.

STATEMENT XI.—Statement showing the operations of the fish-curing yards of the Madras Presidency during the year ending 30th June 1925.

Division.	Districts.	Expenditure.					Weight of cured fish removed.	Quantity of salt issued to each maund weight of fish.	Value of salt issued.	Weight of salt issued.	Weight of fish brought to be cured.	Number of applications for salt.	Total.			
		Buildings.	Establishment.	Contingencies.	Repairs.	(11)							(12)	(13)	(14)	(15)
		New Works.														
East Coast.	Ganjam, Vizagapatam and East Godavari ...	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	Mds. Srs.	Lb.	RS. A. P.	Mds. Srs.	Mds. Srs.	42,604	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
	Nellore and Chingleput districts ...	1,797 11	1,11,457 5 0	2,738 14	15,993 14 2	1,797 11	58,961 17	1071	13,401 38	16,752 7 0	106,694 13	42,604	13,401 38	16,752 7 0	106,694 13	42,604
	Tanjore, Tinnevely and Rannad ...	105 12 0	4,742 2 0	3,019 14 5	8,855 8 7	105 12 0	30,935 1	1154	7,750 32	9,688 8 0	52,944 14	7,976	7,750 32	9,688 8 0	52,944 14	7,976
	Total East Coast ...	105 12 0	6,205 4 0	24,651 3 5	9,844 13 8	105 12 0	31,956 28	1483	11,654 14 6	30,476 27	38,095 13 6	62,739	11,654 14 6	30,476 27	38,095 13 6	62,739
West Coast.	Malabar and South Kanara ...	105 12 0	3,869 3	6,224 9 11	34,694 4 5	105 12 0	121,853 6	1236	9,217,287 12 6	173,830	1,005,457 36	114,297	9,217,287 12 6	173,830	1,005,457 36	114,297
	Grand Total, East and West Coast ...	8,273 3 0	10,413 1 6	1,22,023 6	5,112,120 9 0	8,273 3 0	755,871 24	1236	204,366 36	55,833 10 0	1,305,026 99	177,036	204,366 36	55,833 10 0	1,305,026 99	177,036

STATEMENT XII.—Government Fisheries Cannery, Chaliyam—Production Account for the year ending
31st March 1925.

	Amount. RS. A. P.	Amount. RS. A. P.	Amount. RS. A. P.
To opening stock—			
Raw materials	10,768 14 1	...	...
Empty cans	1,208 2 0	...	...
Guano	177 4 0	...	...
Fish oil	14 0 0	...	...
Prawn shells	6 14 0	...	...
Pit manure	20 0 0	...	...
To purchases—	12,195 2 1		18,113 3 9
Fish	...		...
Raw material, including condiments, etc.	1,024 3 6	...	...
	13,181 7 0	15,405 10 6	2,941 12 11
To Manufacturing wages	...		
To salaries—			
Mechanic	430 3 0		
Canning overseer	436 6 0		
Stores clerk, half pay...	224 10 6		
Superintendent, one third	400 0 0		
To repairs	1,500 3 6		
To depreciation on tools	149 12 9		
	315 8 0		
	32,508 1 9		

STATEMENT XIII.—Government Fisheries Cannery, Chaliyam—Trading Account for the year ending
31st March 1925.

	Amount. RS. A. P.	Amount. RS. A. P.	Amount. RS. A. P.
To opening stock—			
At Chaliyam and other places	54,027 11 1	...	...
Packing materials	364 0 0	...	...
To Canned fish produced as per produc- tion account	54,391 11 1	...	19,318 0 6
To selling expenses—	13,946 14 5		54,779 15 0
Packing materials	...	54,569 0 0	...
Railway freight	32 9 0	...	...
Petty coolie	376 0 3	...	...
Postage and telegrams	146 3 10	...	...
Advertisement	2,604 6 0	...	...
Salaries	1,531 13 9	...	...
Commission and discount	1,299 11 6	...	...
Travelling expenses	757 3 2	...	...
	101 5 0	...	...
	6,939 4 6	...	1,179 14 6
	75,277 14 0		75,277 14 0

ABSTRACT ESTIMATE.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)
		RS. A. P.		RS. A. P.
64 C. ft. ...	Concrete: broken bricks in lime mortar.	22 0 0	100 C.ft.	14 0 0
290 C. ft. ...	Mud wall including mud and cow dung plaster.	1 0 0	Do.	3 0 0
755 R. ft. ...	Casuarina wood in R. ft. ...	0 2 0	R.ft.	95 0 0
583 Sq. ft.	Bamboo Trellis work ...	2 4 0	100 Sq.ft.	13 0 0
75 ..	Tarring, two coats ...	1 0 0	Do.	1 0 0
800 ..	Roofing with corrugated asbestos sheeting.	0 6 6	Sq.ft.	325 0 0
79 R.ft. ...	Ridgings and valleys ...	1 0 0	R.ft.	79 0 0
517 Sq.ft.	Flooring (mud and cow dung).	1 0 0	100 Sq.ft.	5 0 0
...	Iron work including nails, washers, screws, etc., complete.	...	...	30 0 0
...	Excavation and filling in ...	...	...	5 0 0
...	Contingencies ...	...	...	570 0 0
				20 0 0
				590 0 0

Order—No. 530, Development, dated 1st April 1926.

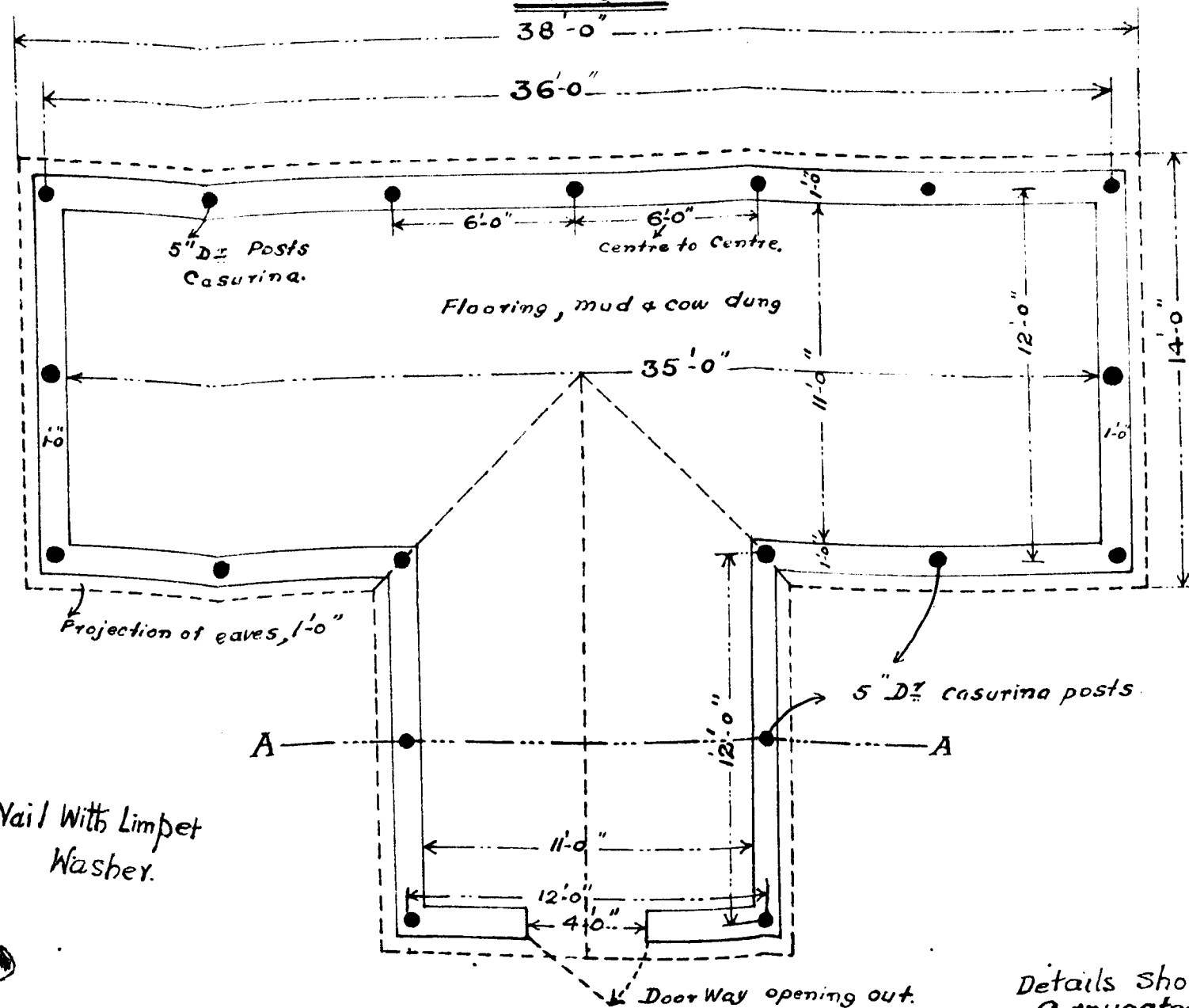
Recorded.

2. The report under review is the first to give an account of a full year's work in all branches of the department's activities, the previous year being in certain respects a period of transition. Three abnormal factors adversely affected the financial results of the year, the failure of the fishing season on the West Coast, the difficulty in working the chank fishery on the East Coast owing to the wholesale migration of the divers to the pearl fishery in Ceylon and cyclones and floods on both coasts. On the other hand the fish-curing yards, consequent on an enhancement of the issue price of salt and a better system of management, somewhat unexpectedly showed a surplus of Rs. 14,955-13-6 instead of being run at a considerable loss as in previous years. The figures in the report, however, relate to the Fisheries year which commences on the 1st of July and ends on the 30th of June and do not therefore include the transactions of the first three months of the official year 1924-25. The Government have recently had under their consideration the question whether the financial results of the working of the yards during the official year 1924-25 justified any reduction in the issue price of salt, but as the results, as pointed out by the Director, showed a net loss of Rs. 6,766, the Government have decided that the question should be postponed for the present.

3. The Chaliyam fish cannery had no better success than in the previous year. The decrease in sales was no doubt partly due to the dislocation of traffic resulting from floods on the West Coast, but the conclusion to be drawn from the figures of each year since the cannery started operations is that the demand for tinned fish in India is limited and not capable in the near future of any considerable extension and that the chances of creating an overseas market are problematic. If the experiment must be considered a failure it is not on account of any lack of suitable raw material or any technical difficulties in the processes of canning arising out of the nature of the climate, but because the market for the finished product is not wide enough to allow of manufacture on a scale sufficiently large to cover overhead charges. The question of the future of the cannery is engaging the attention of the Government; in the meantime further manufacture has been suspended and special efforts are being made to dispose of the stock on hand.

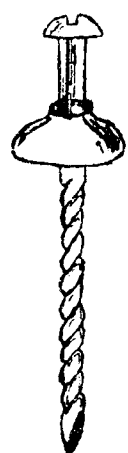
4. The Tanur experimental station was again handicapped by the absence of the fish shoals which usually visit the West Coast

= A =
Design for
A Proposed Shed for Fish curing yards
Scale 5' to 1"

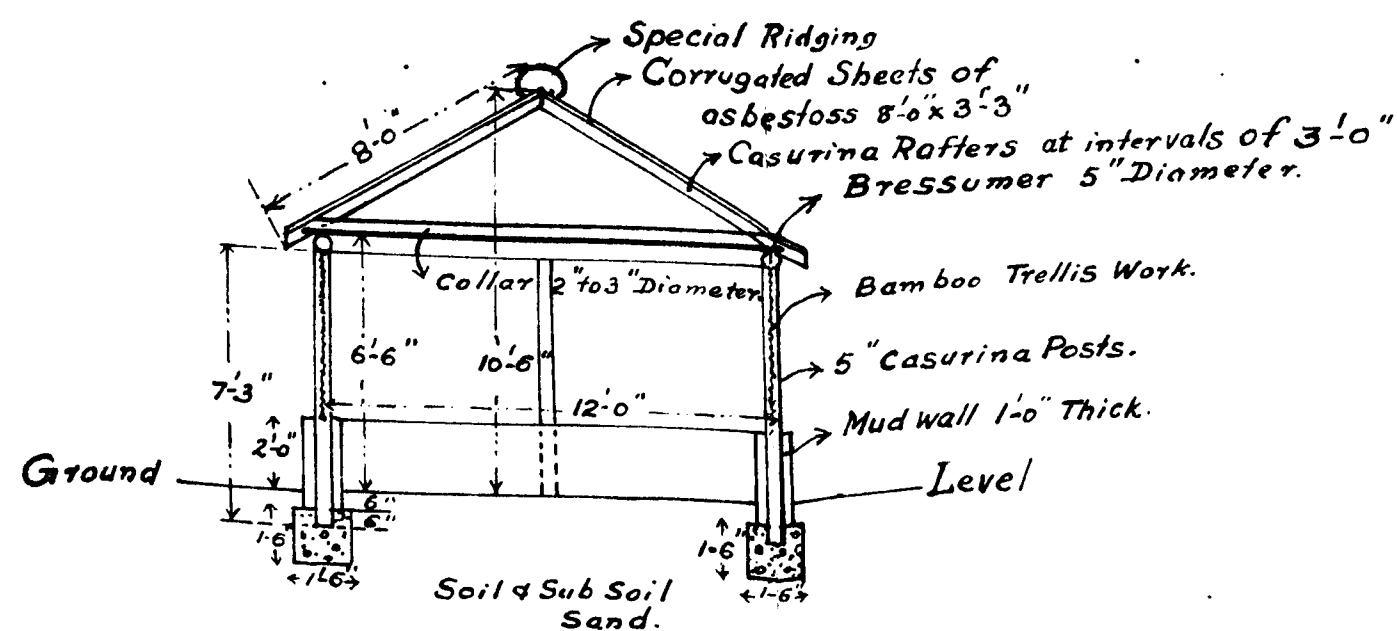
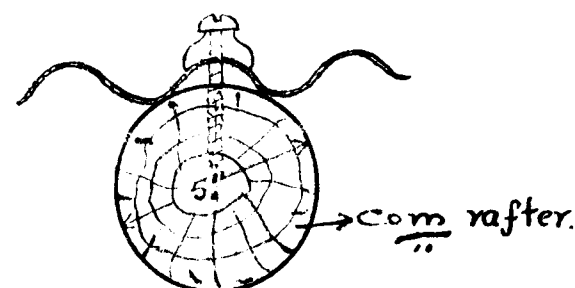


= Plan =

3" screw Nail With Limpet Washer.



Details showing the fixing of
 Corrugated Sheets to Com. rafters
 by 3" Screws with Limpet Washer



= Section on AA =

See page 43.

from September onwards. The quantities of fish cured and of oil, guano and fishmeal manufactured were therefore perforce limited and the operations of the year ended in a loss. Owners of private oil and guano factories were equally hard hit by the failure of the fishing season and will continue to suffer losses so long as the fish shoals absent themselves from the coast. A trawler has been purchased and a master-fisherman engaged with a view to deep sea fishing experiments in general and in particular to an investigation of the problem of locating sardine and mackerel shoals in deep water when they fail to approach the coast.

On the research and experimental side the most important investigations in progress at the station were those connected with the processes of curing fish. The demand for cured fish and fishmeal for home consumption and for export is so large that further expenditure on equipment for the laboratory and plant for the factory appears to be necessary with a view to more thorough trial of new processes; the Director will be requested to submit proposals. The Government also consider that further steps should be taken to follow up the preliminary inquiries made into the possibility of establishing direct trade relations with merchants in Singapore with a view to exploiting markets in the Far East.

5. The pearl fishery which was opened in February 1926 and has just been closed has yielded satisfactory results. Another fishery will probably be held early in 1927. The Government are inclined to agree with the Director that legislation is necessary in order to enable the department to exercise adequate control over the operations at all stages; the question will be further examined on receipt of the Director's report regarding the experience gained in the fishery that has just closed. The comparative failure of the chank fishery in the year under review was not unexpected; no satisfactory results can be expected so long as the counter-attraction of a pearl fishery draws the divers away to Ceylon.

6. The expansion of the Inland Pisciculture section has again been retarded by financial considerations. Schemes for developing existing fish farms and for exploiting new areas have been unavoidably postponed for want of funds. The control of inland fisheries enables the department to increase the available supply of edible fish by the introduction of new varieties superior in quality to the indigenous species and at the same time to improve the condition of the fishermen by leasing fishing rights to them through the medium of special co-operative societies. The

Government therefore consider that the policy of resuming fisheries on payment of compensation to the local bodies concerned should be continued. The income from individual fisheries fluctuates from year to year according to seasonal conditions but on the average of a series of years may be expected to increase gradually under expert management leaving a margin sufficient to cover the cost of improvements.

7. Allusion has already been made to the financial results of the management of the Government fish-curing yards. The prosperity of the industry is to a large extent dependent on a plentiful and cheap supply of salt. Salt is issued to curers duty-free in the Government yards; the price of issue is therefore mainly governed by the cost of transport and the expenses of management. Transport to the yards on the West Coast is comparatively expensive because the salt has to be brought all the way from the East Coast by boat or rail. A scheme is under the consideration of the Government to utilise the steam trawler mentioned in paragraph 4 above for towage purposes when not engaged in deep-sea fishing experiments in order to facilitate transport by sea. Proposals have also been sanctioned by Government since the close of the year for the construction of additional storage accommodation in seven yards with a view to lessen the incidence of wastage. In regard to the question of management, the difficulties of controlling the subordinate staff in yards scattered over the length of the East and West Coasts are obvious. The yards are often located in inaccessible places where the amenities of life are few and the opportunities for oppression are many. Certain tentative steps were taken in the year under review to improve the system of supervision; further proposals for strengthening the inspection staff are under consideration.

8. The working of the minor sections of the department calls for no special comment. The scheme for the establishment of a biological station on the East Coast in conjunction with the University had to be postponed for want of funds. The Government hope that it will be possible to allot funds for the scheme next year. Little progress in this branch of research has so far been made owing to the inability of the Director to give his personal attention to the work of supervision, his time being preoccupied with administrative details.

9. On the socio-economic side, the Government regret to note that the co-operative movement made no progress and in some

respects retrograded. The difficulties of organizing effective co operative societies for the benefit of fishermen are admittedly great; the poorer classes are for the most part ignorant and improvident and very much in the hands of unscrupulous middlemen and money-lenders whose interest it is to exploit their weaknesses and obstruct any measures devised to ameliorate their condition. Change to them means revolt against established custom and dislocation of their domestic economy. The most promising line of approach to the problem appears to lie through the spread of education among the younger generation. The Government note with satisfaction the increase in the attendance of children at the special schools organized by the department and consider that the results achieved justify the opening of additional schools. For the older generation, who cannot come under the same influence, it remains to devise a form of co-operation the immediate positive advantages of which are within their capacity to appreciate. Possibly some amount of direct financial assistance may be found necessary; the Director's proposals to grant loans of Rs. 1,500 to two societies are under consideration.

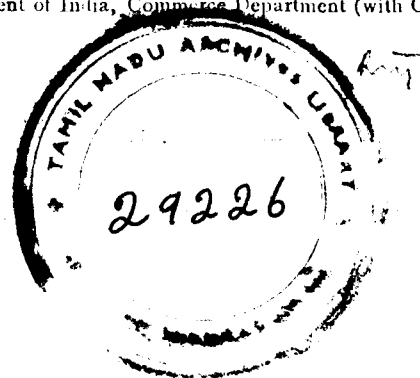
(By order of the Government, Ministry of Development)

V. PANDRANG ROW,
Acting Secretary to Government.

To the Director of Fisheries,

- „ the Local Self-Government Department.
- „ the Public Works Department.
- „ all Collectors.
- „ the Board of Revenue (Land Revenue and Settlement).
- „ the Board of Revenue (Separate Revenue).
- „ the Law (Education) Department.
- „ the Registrar of Co-operative Societies
- „ the Finance Department.
- „ the Public Department.
- „ the Accountant General.
- „ the Director-General of Commercial Intelligence (with C.L.).
- „ the Government of India, Commerce Department (with C.L.).

Editors' Table.



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2. NOTE ON FISHERIES IN JAPAN. BY SIR F. A. NICHOLSON, 1907. (Out of print.)	
THE PRESERVATION AND CURING OF FISH. BY SIR F. A. NICHOLSON, 1909. (Exhausted; revised edition under preparation.)	
4. MADRAS FISHERY INVESTIGATIONS, 1908. BY JAMES HORNELL. (Out of print.)	
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9. FISHERY STATISTICS AND INFORMATION, WEST AND EAST COASTS, MADRAS PRESIDENCY. COMPILED BY V. GOVINDAN, WITH INTRODUCTION BY SIR F. A. NICHOLSON, 1916, Re. 1-12-0—	
Gives a summary of the numbers of fish-curing yards and fishing boats, the methods of curing fish and a sketch of the economic conditions now existing, etc. (Pages 140.)	
10. ANNUAL REPORTS OF THE FISHERIES DEPARTMENT FOR EACH YEAR FROM 1908-09 TO 1916-17. BY SIR F. A. NICHOLSON, Re. 1-10-0. (Pages 179.)	
1. MADRAS FISHERY INVESTIGATIONS, 1917, Re. 1-4-0—	
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