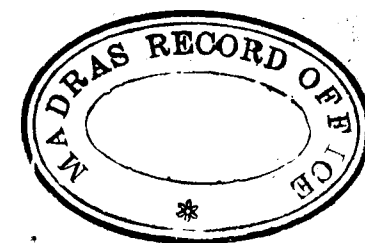


# MADRAS FISHERIES DEPARTMENT

## ADMINISTRATION REPORT

FOR THE YEAR

1923-24



BY

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

*Report No. 1 of 1925*

*Madras Fisheries Bulletin, Vol. XIX, pages 1 to 58.*

MADRAS

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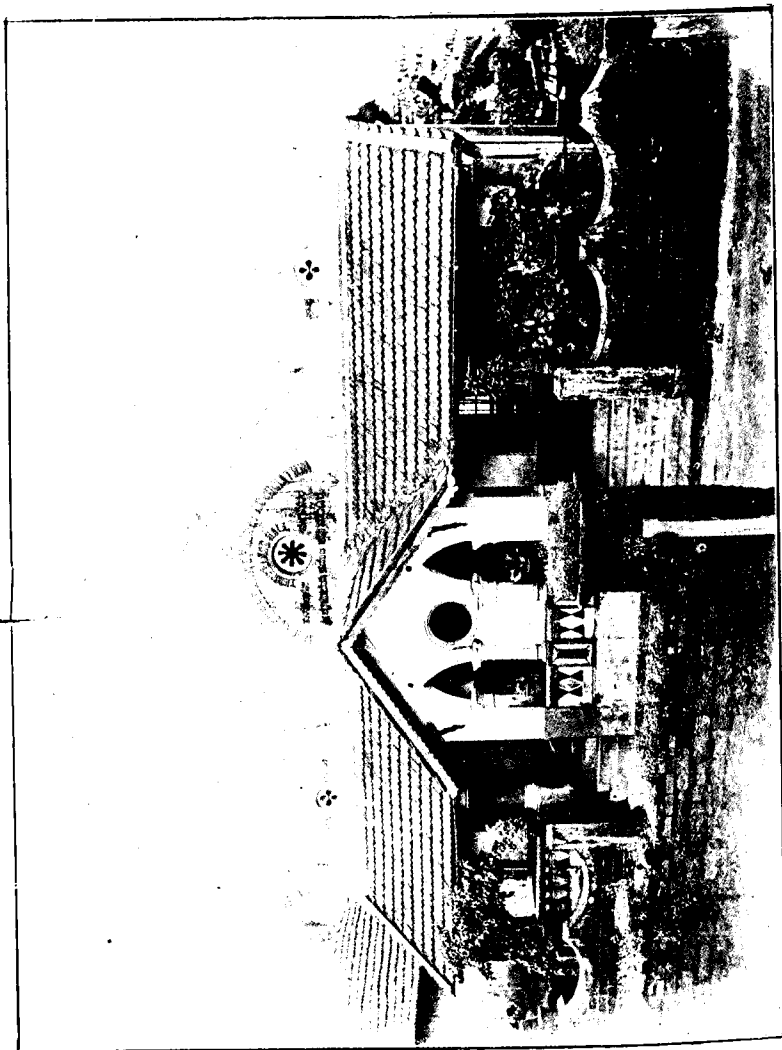
1925

PRICE, 1 rupee 8 annas.

The Sree Gnanodaya Hall, Mangalore, built in 1919 with the aid of a Government grant by the Fishermen Temperance Society. One of the first elementary schools for fishermen established by the Fisheries Department is conducted in the building.

[See page 42.]

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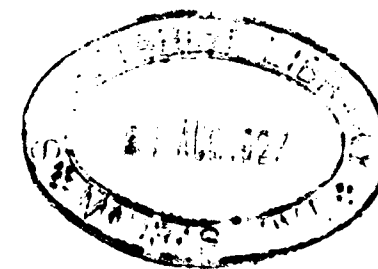


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*Report No. 1 of 1925.*

ADMINISTRATION REPORT OF THE DEPARTMENT OF  
FISHERIES FOR THE YEAR ENDING 30<sup>TH</sup> JUNE 1924

BY

Dr. B. SUNDARA RAJ,

*Director of Fisheries.*

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I have the honour to submit the Administration Report of the Fisheries Department for the year ending 30th June 1924. The delay in the submission of the report was caused by the interruption of communications on the West Coast due to floods, owing to which the Assistant Director of Fisheries (Coast), Calicut, was not able to submit his report in time, thereby delaying the preparation of this report.

2. *Administration.*—After fifteen years' distinguished service to the Department, first as Superintendent, Pearl and Chank Fisheries, and subsequently as Director, Mr. James Hornell, F.L.S., F.R.A.I., retired on 6th August 1923. Sir F. A. Nicholson founded the Fisheries Department in this Presidency. This is not the only, though perhaps the most outstanding, achievement of his genius and enterprise. Up to now the main lines of the Department's activities are substantially the same as those originally formulated by his farsighted initiative. Mr. Hornell followed him in 1918 as the first full-time technical Director and had a most difficult task to accomplish within the period of four and a half years for which he held office. While keenly alive to the needs and disabilities of the Department, he was severely handicapped by the depleted finances of the local Government, the depression which followed the Great War and the impossibility of planning or initiating any new or lasting scheme of development within his short tenure of office as Director. In spite of the arrest in the development in new directions due to financial causes beyond his control, his

regime was marked by solid progress in all the established sections of the Department. In many respects the closing year of his control was a record. Beyond the gradual development of the Department's work, in consolidating the financial position of its operations, particularly on the industrial and commercial side, in initiating biological fisheries research, in reorganizing the Aquarium and the chank fisheries and in precipitating action, despite financial stringency, on the long-thought-of scheme of experiments in deep-sea fishing with up-to-date craft and tackle, he has rendered invaluable service to the Department under very trying circumstances. His greatest contribution, however, was in the field of fishery literature where his peculiar gifts lay. He has added no less than six volumes and contributed ten original papers, annual reports excluded, to the Madras Fisheries Bulletins on pearl, chank, fishing craft and tackle and marine biology since he became the Director.

3. In the year under report, the Department passed through a great crisis. The Retrenchment Committee resolved that as a number of the Department's activities were not remunerative, according to the Committee's calculations, they should be curtailed and attached to other departments and "Fisheries" need not be retained as a separate department. The very favourable financial results of the Department's work in 1922-23 showed the Government that the recommendations of the Retrenchment Committee were not *prima facie* justifiable, and after a careful consideration of the Committee's report, it is gratifying to note that the Government, in recognition of the value of the work done by the Department, have decided, since the close of the year under review, to continue it on the present lines.

4. In spite of the damping effects which the recommendations of the Retrenchment Committee have necessarily had on the enthusiasm and initiative of the officers, the year's record has been satisfactory in many directions. The profits from chank fisheries increased by over Rs. 4,000; the inland fisheries yielded a substantial revenue in spite of the prevailing adverse conditions of drought in some inland districts and flood in certain others. The biological and oyster supply and the Aquarium, which were considered as working at a loss by the Retrenchment Committee, have been made more than self-supporting. The progress of the socio-economic activities of the Department on the West Coast continued.

The Tanur Experimental Station and the Cannery, however, worked at a loss, the former due to an unfavourable fishing season and the latter due to the write-off of a large number of tins which had been badly stored by our late agents in Madras for a long time and were subsequently found in an unsaleable condition as explained in my letter forwarding the audit report of the Cannery.

5. It is worthy of note that in the year under review, while the very existence of the Department was being threatened, there has been very great and marked expansion of the sphere of the Department's operations on entirely new lines. The fish-curing yards, which were under the control of the Salt Department, were transferred *en masse* to the control of the Fisheries Department from 1st April 1924, whereby a large and badly needed addition to the staff of the Department was made, through whom the Department could hereafter be in intimate touch with fisheries and fishermen throughout the coast of the Presidency. For the collection of statistics, the record of observations, the introduction of improved methods of capture, cure and marketing of fish and fisheries products and in the socio-economic activities generally, a widespread staff is a desideratum. With the acquisition of the yards and the yard staff, this long-felt need has been supplied. An equally salient feature of the year is the initiation of experiments in deep-sea fishing on modern lines by a motor launch under a European expert. The experiments, however, unfortunately failed, not through any inherent unsuitability of Indian waters for such fishing, but by reason of the utter unsuitability of the launch employed. A proposal to purchase a Danish cutter to continue the experiments was made and received the unanimous support of the Advisory Committee for Fisheries and Industries, but the Government have recently vetoed the scheme.

6. In consequence of the recommendations of the Retrenchment Committee, I have had to effect a thorough scrutiny and overhauling of the activities and finances of each section. Also with the transfer of the fish-curing yards to my control since 1st April 1924, the subordinate executive staff of the Department, excluding peons, has been quadrupled. Owing to the extra demand on my time made by the considerably increased administrative work which had fallen on the Department on account of the above two reasons, I have not been able to devote the necessary time to technical and research work. The attention that I was able to pay to the

biological specimen supply work at Ennur, the prompting of a few industrial experiments at Tanur in fish curing and oil refining and the carrying out of small improvements in the process of manufacture and storage of canned fish at Chaliyam was all that was possible. Unless I can arrange for substantial relief in regard to administrative routine, I am afraid I would not be able to do justice to the more important technical activities of the Department. I shall submit my proposals on this subject separately.

7. *Personnel*.—Particulars of the personnel of the staff will be found in statement No. I annexed to this report.

On 6th August 1923, I took charge of the Department from Mr. Hornell on my return from England after two years' study leave. M.R.Ry. Rao Bahadur V. Govindan Avargal, B.A., F.Z.S., to whose enthusiasm and initiative the Department owes the successful execution of the many schemes for the education and the socio-economic uplift of the fishermen communities on the West Coast, retired on 10th May 1924 after a long and useful service of thirty years. My Personal Assistant, Mr. U. Karunakara Menon, B.A., was appointed in his place. Through the courtesy of Mr. P. L. Moore, Secretary to Government, Local and Municipal Department, I was able to secure the services of Mr. M. V. Sankara Variyar, B.A., for six months and he joined my office as Personal Assistant on the afternoon of the 3rd May 1924. The staff otherwise remained the same as in the year previous.

#### GOVERNMENT FISHERIES CANNERY, CHALIYAM.

8. The Cannery was brought under the commercial system of accounts with effect from 1st April 1924. Consequently, the present report deals with a period of only nine months from 1st July 1923 to 31st March 1924.

9. The Cannery during this period continued to be under my direct supervision. In November 1923 the post of Superintendent was created temporarily for the period of a year and Mr. T. P. Baratan who was till then the Sub-Assistant in charge of the Cannery was appointed Superintendent. In spite of the cloud of uncertainty that hung over the future of the Cannery, Mr. Baratan and his staff have worked most energetically and enthusiastically to make the working of the concern a success. Unfortunately, however, for causes beyond their control which are explained below, the Cannery worked at a loss of Rs. 1,568 during the period.

10. *Machinery*.—During the period under report two new machines were received from England, viz., a double seamer and a rubber gasket applying machine. It was not, however, possible to put the former machine to use during the year as the rubber rings for the new oval tins were not ordered along with the dies, etc. The rings have since arrived, but have proved unsatisfactory, while the tins stamped by the new dies are defective. I have already complained to the Director-General of Stores regarding the rubber rings and if the defect in the dies could not be remedied locally by the Industrial Engineer they will have to go back to the makers. The resultant delay, inconvenience and loss is considerable.

11. *Output and sale*.—Mackerel and prawns have again been scarce during the year under report. Only a few hundred tins were packed which were sold within a few months. Although the demand for them continues, the Cannery is not in a position to supply. Such a contingency which affects the financial aspect of the Cannery, besides inconveniencing the public, could only be avoided by holding heavier stocks of the goods than hitherto to last over years of scarcity. Steps have been taken to increase the stock of prawns by deputing a trained maistri to pack prawns at Tanur for the Cannery during the slack season. A good stock of mackerel will be arranged for when mackerels appear again.

The year opened with a stock of 148,246 tins of all sorts, and during the period of nine months from July 1923 to March 1924, 74,113 tins of all kinds were canned against 68,029 tins canned during the previous season. There was a balance of 179,426 tins on 31st March 1924 valued at Rs. 54,027 at two-thirds of the selling price.

15,602 tins, an unusually large number, had to be written off the accounts. At the stock-taking on 1st April 1924 a good many tins from the stock which were till 27th February 1924 in the custody of our Madras agents were found to have rusted and deteriorated and therefore in an unsaleable condition. Most of these tins belonged to the 1918 and 1919 packs which had been transferred to the agents nearly three years ago but had to be taken back, on the termination of the agency in February last, and as many as 12,968 tins had to be condemned and written off the accounts. The fact has been reported on in my letter to Government forwarding the auditor's report for the period.

As the sales through our Madras agents became even more unsatisfactory than in the preceding year, their agency had to be terminated after the notice of three months due to them as per terms of the agreement. There were practically no sales during these three months and no new agents could be appointed. Consequently there was a fall in the sales, only 27,331 tins being sold during the period against 36,835 tins sold during the same period in the preceding year. Efforts have been made recently to appoint new agencies both for India and outside to exploit the important markets, and an agent has also been appointed for England. Advertisements have been inserted regularly in the "Statesman," the only paper which yields appreciable financial returns. Wall posters in coloured type were printed and posted in Madras, Bangalore and Calcutta. A new illustrated single sheet price list was also issued during the year. It is hoped that with the aid of these agencies and the reputation and advertisement which some of our canned goods appear to have gained at the British Empire Exhibition, the sales during the current year will show an improvement.

12. In the discussions resulting from the Retrenchment Committee's recommendations some doubt was expressed as to whether canning will ever be a commercial success in India, as tinned fish are a novelty and are consequently not favoured by Indians. I give below a statement of the quantities of tinned fish imported into India for the last three years extracted from the "Accounts relating to the Sea Borne Trade and Navigation of British India for the calendar year 1923" :—

| Year. | Quantity imported.<br>CWT. | Value.<br>RS. |
|-------|----------------------------|---------------|
| 1921  | 7,741                      | 6,65,365      |
| 1922  | 28,954                     | 18,95,916     |
| 1923  | 26,236                     | 14,50,947     |

Even if the Cannery should set itself to supplant this foreign import by its own products she will find a market for her goods. But the greatest opportunities lie undoubtedly in the foreign market at no greater distance than Burma and the Straits Settlements. During 1923 the import of American tinned sardines into Malaya increased by more than 100 per cent over that of 1922. According to a recent report of the United States Consul at Malaya (Straits Settlements), the average monthly imports of sardines into Penang is about 3,000 cases and nearly double this amount is received at

Singapore. "In recent months," says the Consul, "an unprecedented demand has developed throughout Malaya for sardines prepared by American packers. Originally marketed only among the European inhabitants this type of preserved fish is now being adopted almost universally by the Chinese. . . . Heretofore these people in Malaya have depended to a great extent upon dried fish as one of the most important of their foods. But now that a tin of sardine may be had for a few cents, the use of dried fish is growing noticeably smaller and the more delectable, far more healthful canned variety is in greater demand. . . . The proverbial dried fish which since time immemorial has hung before the small Malay shops has in many instances been taken down and replaced with a case of cheap sardines." The American shipments of sardines to the Straits Settlements for the past two years were :—

| Year. | LB.       |
|-------|-----------|
| 1922  | 2,653,813 |
| 1923  | 6,053,497 |

There can be no reasonable doubt about the great opportunity that exists for our canned fish in the Straits Settlements where a market is rapidly developing and every effort shall be made to advertise and popularize our goods there. Since the close of the year the Government sanctioned my proposal to depute an Agent, Mr. Alf. O. Ginivan, to introduce our goods into Malaya and canvass sales.

The canned goods exhibited at the Bellary and Bangalore exhibitions have both been awarded certificates of merit.

13. *Experiments* are in progress on various matters connected with the technique of canning and proper storage of tins. In view of the great demand for sardines in tomato sauce in the Straits Settlements a sample consignment of sardines packed in tomato sauce was sent to an agent in Singapore to ascertain possibilities and the results are awaited.

14. *Finance*.—The financial statements of the auditors for the period under report are appended. They show that there was a loss of Rs. 1,568. If, however, the heavy spoilage of stock amounting to Rs. 4,137 had not occurred, the Cannery should have shown a profit of about Rs. 2,500 as explained in my letter No. 1303-P/24-7, dated 16th August 1924, forwarding the auditor's report.

## TANUR EXPERIMENTAL STATION.

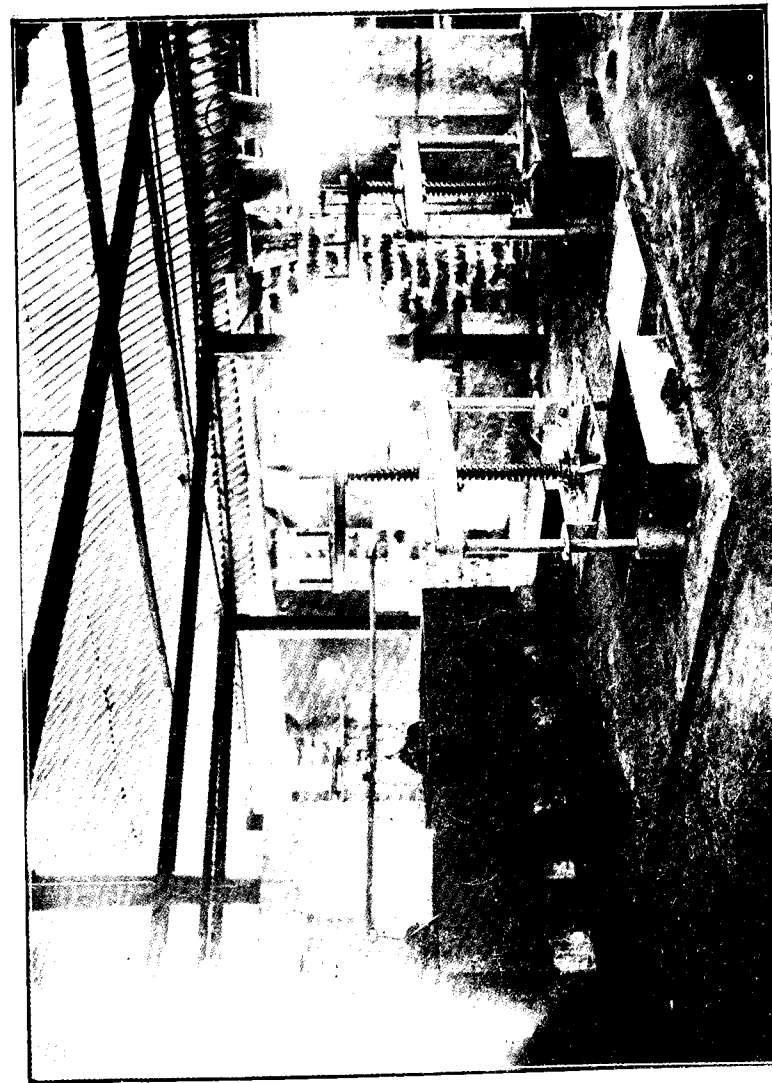
15. The fishing season of 1923-24 was on the whole disappointing as sardines and mackerel, the two most important kinds of fish, were scarce. Consequently the routine commercial operations consisting of the manufacture of oil, guano and cured fish were limited. The trading and profit and loss accounts of the station appended to this report have been prepared according to the instructions of the Chartered Accountants, Messrs. Fraser & Ross, and they show a net loss of Rs. 1,275 in the year's working. The poor fishing season and the fact that a considerable portion of the expenditure was on apparatus and technological research, as will be seen below, contributed to the loss. The loss will be more than made good in a favourable year such as the year previous, when according to the audit report of the chartered accountants a profit of Rs. 3,480 was made.

16. *Curing operations.*—The total quantity of fish purchased for curing was 92,031½ lb. as against 249,293 lb. last year; in consequence many of our usual customers could not be supplied.

There were demands for the cured products from far and near throughout India, such as Coonoor, Vellore, Chingleput, Kodaikanal, Yercaud, Simla, Delhi, Jansi, Bankipore, Kolar, Calcutta, Secunderabad, Kashmir, Rutlam, Dehra Dun, Lucknow, Allahabad, Assansol and Shillong.

17. *Oil and Guano operations* were also very restricted owing to the scarcity of sardine shoals. The total weight of fresh sardines dealt with amounted to 185,260 lb. at a cost of Rs. 808 against 417,053 lb. at a cost of Rs. 1,459 during the previous year. The output was 8,398 lb. of guano and 22,113 lb. of fish meal. As the output of guano was too small to attract the attention of the big regular customers the whole of it was sold to private individuals. The lower grades of oil and stearine as well as the residues of the oil refining were sold to the Government Soapery. The higher grades were supplied to the Cannery and to the Military Department. A few tins of medicinal oil have also been sold but its popularization is put off awaiting the result of the "Vitamin" test.

18. *Fish meal.*—The quantity of fish meal manufactured during the year was more than double that of the previous year, being 22,113 lb. against 10,300 lb. during the previous year. There was also a considerable increase in the sales, orders having



Sardine-oil hand presses and boiling troughs, Government Experimental Station, Tanur, which have been copied by some 860 private factories in Malabar and South Kanara.

been placed from such distant parts such as Ananoli, Dehra Dun, Pasa, Rura, Peshwar, Nahan, Kalaw, Sangli, Shillong, Rangoon, etc. The United Provinces Poultry Association has helped us to sell about one ton; the Director of Agriculture, Travancore, took half a ton; the Carnatic Mills, Madras, is taking 3 cwt. per month. There are a host of other small customers who purchase occasionally. However, the internal demand is not great enough to absorb the annual output, while, on the other hand, the output cannot be increased sufficiently owing to imperfect appliances detailed in last year's report to meet the enormous foreign demand. The Director of Industries has been requested to instruct the Industrial Engineer who is on deputation in America, if he visits California, to inspect and report on (1) the Hiller fish reduction unit plant of Messrs. Stanley Hiller, M.C., San Francisco and their new smaller sized reduction plant and (2) the California fish meal plant for a continuous process of the California Press Manufacturing Co., San Francisco—two of the latest and most up-to-date machinery in the market. The production of crude fish oil and guano by hand power has been reduced to an established routine. The time and energy of the Tanur staff should therefore be diverted to oil refining and other allied fish and bi-product industries. A small fish-oil extracting power plant which will mechanically deal with raw sardines will afford the much needed relief to the staff for concentration on new lines of industrial research besides providing a highly desirable demonstration of the possibilities of mass production by modern machinery to the private oil and guano factory owners. For the present, however, wider publicity within India is planned to combat the ingrained conservatism of the people against the use of fish meal for feeding cattle and poultry.

19. The products of the station were exhibited in August in the Bellary Exhibition and at Mangalore in December. The usual certificates of merit were received from both, and a gold medal for oil from the Mangalore Exhibition.

The station took part in the British Empire Exhibition and supplied models of the oil and guano factory, the old and new types of curing sheds in public fish-curing yards and a variety of products as fish meal, guano, fish oil of all grades, fish bladder, skate tails, etc. As a result of this many inquiries have come from England for all these products.

20 *Experiments and research.*—The defects from which cured fish suffer are (1) "Pink eye," a type of mole; (2) "Rusting," a red discolouration after long storage, due to a chemical change in the fat of the fish and (3) in the case of semi-dried prawns, a special product of the station, the formation after a time of a white excrescence. For the first time this year research for the prevention of these well-known defects was taken up. Experiments in storing and packing in oxygen-free atmosphere to prevent the rusting of fat, and similar experiments for the prevention of "Pink eye" and saline excrescence on prawns by the use of harmless disinfectants or sterilization of salt are in progress. The research has already shown possibilities of keeping salted fish in fine condition for over six months. I hope to devote more time than has been possible during the year under report for the direction of technological research at Tanur, in future. A small biochemical laboratory is now being fitted up for the purpose there. Experiments on a larger scale with greater accuracy and control have been planned for the current year.

21. Between November and March drift net fishing with boats and nets available at Tanur to increase the supply of fish for curing purposes was tried as an experiment and catches valued at Rs. 219 resulted. The operations showed that nets and boats were subject to great wear and tear and the study of their preservation has been taken up. The indigenous materials used in tanning nets, such as barks, leaves and berries have been collected and the methods prevailing in the several places are being studied for comparative experiments with western methods.

22. The local methods of net-making continue to be primitive and laborious. The net-making machine purchased from Bridport in 1915 is not in working order although an effort has been made to work it by the Industrial Engineer and his staff. Captain Cribb, the Master Fisherman, was instructed to visit Bridport while in England to study the methods of working the machine, but unfortunately Government have since decided to terminate his services from the 16th October 1924.

23. The following improvements in the method of manufacture of fish oil and guano and fish meal effected during the year under report deserve mention:—

(a) The separation of oil from the effluent liquid and its subsequent washing has been considerably improved.

(b) A more effective method of stearine separation has been adopted and a cheap substitute for a filter press has been evolved which enables the removal of 75 per cent of the intermixed and undecantable oil which used to remain with the stearine.

(c) High class edible oils for vitamin test were prepared according to the best European methods, with perfect control on temperature, exposure to air and contamination from effluent liquid and metals, etc. The samples will be tested both in the Government Ophthalmic Hospital at Madras and in European laboratories.

(d) The decolorizing experiments have improved so far, that the oil resembles the best cod-liver oil as per specifications of the British Food Investigation Board.

(e) The effluent water containing rich manurial matter is generally drained out to the sea by reason of its nuisance. By special treatment the whole effluent water of the season was used for manuring the coconut trees. The complete recovery of the manurial matter by precipitation or otherwise is under investigation.

(f) The objectionable high oil content of fish meal (13 per cent in 1922) has been reduced to 7 per cent by careful regulations of the temperature and pressure of steam during cooking.

(g) The difficulty of breaking up the pressed cake into fine shreds to ensure quick and thorough drying has been got over. A cheap disintegrating machine has been designed which can deal with 10—15 tons of scrap per day.

(h) The methods of sterilizing fish meal have also been improved considerably so that the necessary high temperature, without the attendant danger and injury to the staff, is now employed at a normal cost.

(i) The deodorization and other treatment of fish oil as a cheap substitute for linseed oil for paints and varnishes is under determination.

(j) Fish meal has been prepared not only from sardine and mackerel but also from other small fishes. As the cost of the latter is high at present, the majority of our customers cannot afford to purchase any other than sardine meal. Cheaper processes of manufacture are being attempted.

The Sub-Assistant, Mr. O. Sankaranarayana Menon, B.A., in charge of the station has displayed noteworthy skill and initiative in all the various lines of investigation carried on at the station.

24. *Private oil and guano factories.*—Roughly calculating, the guano manufactured by private factories during the season was about 22,500 tons valued approximately at Rs. 13,50,000 as against 32,000 tons valued at Rs. 24,00,000 in the previous year. The price of guano ranged from Rs. 65 to Rs. 80 ex-factory. 17,000 tons of fish manure were also manufactured, estimated to sell for Rs. 6,80,000. The quantity of oil manufactured was 7,250 tons as against 12,000 tons in the previous year. The oil market is very tight, the price ranging from Rs. 125 to Rs. 300 per ton. The value of the oil manufactured is estimated at Rs. 14,50,000.

25. Owing to the failure of the sardine season in South Kanara and South Malabar, there were only 440 factories on the whole working during the year 1923-24 as against 647 in 1922-23. All the factories licensed by the Tellicherry Municipality seem to have been licensed by the Kottayam Taluk Board also, so that the factory owners have had to make double payments of licence fees. The attention of the President of the Kottayam Taluk Board has been invited to G.O. No. 2465, L. & M., dated 9th December 1921, which enjoins the Taluk Board not to license factories situated within three miles of municipal limits. The Chirakkal Taluk Board has charged Rs. 15 as licence fees while the maximum amount that can be charged according to the by-laws framed by the District Board is only Rs. 10. The President of the Chirakkal Taluk Board however points out that under section 193 (1) of the Local Boards Act, 1920, the Taluk Board has got the liberty to fix the licence fees. Lack of co-operation and the cupidity of local bodies, unless checked, is apt seriously to hamper the industry.

G.O. No. 1581, Development, dated 25th November 1922, directs that the reports and diaries of Sanitary Inspectors inspecting fish and oil and guano factories should be submitted through the Fisheries Department. During the year under report, no such diary has been received. In a majority of cases Health Inspectors were inspecting these factories. But no inspection was done in the Coondapoor taluk on account of the scarcity of sardines. In the Udipi taluk Sanitary Inspectors were doing inspection work while in the Kasaragod taluk the members of the Taluk Board were themselves inspecting

26. No systematic tour was undertaken by the oil and guano Inspector, as was done in previous years, partly owing to the failure of the sardine season and partly because the oil and guano Inspector for part of the time had to combine the duties of Socio-Economic Sub-Assistant as well. He also assisted the Assistant Director in the collection, mounting and despatch of exhibits for the British Empire Exhibition.

27. In February 1924, Sub-Assistant Mr. M. Jayaram Nayudu, visited the leading oil and guano factories throughout the West Coast to find out whether the fish oil and guano manufacturer was generally realizing undue profits on his trade. The result cannot be considered to be conclusive as, except in very few cases, the books maintained by factory people were not forthcoming, and in some cases two separate accounts were being maintained, one to be produced to the Revenue authorities and the other for their own guidance. The result of the investigation, however, indicates that the oil and guano manufacturer is not profiteering; if he realizes larger profits in one year, he is a loser in the next.

#### PEARL AND CHANK FISHERIES.

28. *General.*—In spite of two adverse circumstances which operated against its success the working of these fisheries continued to be very satisfactory. Plague in Tuticorin scared away divers and the high wages offered by Ceylon merchants induced many of our divers at Rāmēswaram and Mandapam to leave us for work in Ceylon. The net profit realized was Rs. 35,368 against Rs. 38,286 during the preceding year. The results compare very favourably with those of the preceding year. The latter year's receipts included a sum of Rs. 9,450, as hire charges for the utilization of the "Lady Nicholson" for the inspection of the Laccadives, while there were no such unusual receipts during the year under report. I am glad to testify that the efficient work of this section and the favourable results were again due to the energetic and economic management of the Superintendent, M.R.Ry. Rao Sahib J. A. Fernandez, and staff.

29. The general financial position of these fisheries is clearly set forth below. As ordered by Government in G.O. No. 337, Development, dated 20th February 1924, 66⅔ per cent of the pay and travelling allowance of the Superintendent has been debited to the

Chank Fishery accounts and  $33\frac{1}{3}$  per cent to the Pearl Fishery accounts.

| —                                                                                                         | Expenditure. | Revenue.     | Profit (+) or loss (-). |
|-----------------------------------------------------------------------------------------------------------|--------------|--------------|-------------------------|
|                                                                                                           | RS. A. P.    | RS. A. P.    | RS. A. P.               |
| 1. Tinnevely Chank Fishery ...                                                                            | 24,495 13 11 | 65,655 14 11 | + 41,160 1 0            |
| 2. Pay and travelling allowance of Superintendent, Pearl and Chank Fisheries (66 $\frac{2}{3}$ per cent). | 2,404 10 8   | ...          | - 2,404 10 8            |
| 3. Rāmnād Chank Fishery ...                                                                               | 20,893 3 8   | 28,542 12 6  | + 7,649 8 10            |
| 4. Sivaganga Chank Fishery ...                                                                            | 320 14 0     | 246 9 11     | - 74 4 1                |
| 5. Tanjore Chank Fishery ...                                                                              | 8 0 0        | 2,750 0 0    | + 4,702 0 0             |
| 6. South Arcot Chank Fishery ...                                                                          |              | 700 0 0      |                         |
| 7. Chingleput and Nellore Chank Fishery.                                                                  |              | 760 0 0      |                         |
| 8. Pearl Fishery ...                                                                                      | 15,828 11 10 | 663 15 6     | - 15,164 12 4           |
| Total                                                                                                     | 63,951 6 1   | 99,319 4 10  | + 35,367 14 9           |

It will be seen that as usual the main source of revenue was the Chank Fisheries, the Pearl Fisheries being responsible for a deficit of Rs. 15,165.

#### PEARL FISHERIES.

30. During the year under report, the pearl banks were inspected by the Superintendent twice, first in November 1923 and next in March 1924. Copies of the inspection reports have already been forwarded to Government and press communiques have been issued by them on the healthy state of the pearl oysters and the probable time when a fishery may be expected. The Superintendent reports that the condition of the oysters in all the banks is promising and that they continue to grow larger in size and heavier in weight. There had been no signs of destruction except for a few dead and crushed valves here and there and this the Superintendent attributes to the use of the stone anchors on the pearl banks by the fishermen. The Government have been addressed for the issue of orders for the prohibition of the use of such anchors by the fishermen. The banks are patrolled by the "Sutherland" to prevent the fishermen from poaching as oysters are of sufficient size now. It may be necessary soon completely to prohibit fishing on these banks.

There is every prospect of a remunerative pearl fishery in 1926 and thereafter. If, however, the period synchronizes with the Ceylon fishery, there may be some difficulty to secure a sufficient

number of divers. From the closer contact which the Department has by the acquisition of the Rāmnād Chank fishery established with the divers who for the most part belong to the Rāmnād district it may be possible to influence them to work in India for at least part of the time.

#### CHANK FISHERIES.

31. *Summary.*—A comparative statement of the profits earned by the chank fisheries during the last decade is given below:—

| Season.     | Net profit. | Total number of chanks. | Rate per 1,000 chanks. |             |
|-------------|-------------|-------------------------|------------------------|-------------|
|             |             |                         | Tuticorin.             | Rāmeswaram. |
|             | RS.         |                         | RS. A. P.              | RS. A. P.   |
| 1914-15 ... | 16,759      | 307,683                 | 121 0 0                | 140 0 0     |
| 1915-16 ... | 49,426      | 714,490                 | 121 0 0                | 140 0 0     |
| 1916-17 ... | 53,938      | 418,314                 | 121 0 0                | 301 0 0     |
| 1917-18 ... | 57,122      | 391,137                 | 121 0 0                | 301 0 0     |
| 1918-19 ... | 82,611      | 435,262                 | 325 0 0                | 301 0 0     |
| 1919-20 ... | 46,029      | 339,805                 | 325 0 0                | 215 0 0     |
| 1920-21 ... | 36,537      | 283,869                 | 325 0 0                | 215 0 0     |
| 1921-22 ... | 8,266       | 228,198                 | 210 5 0                | 215 0 0     |
| 1922-23 ... | 46,367      | 466,540                 | 210 5 0                | 205 7 0     |
| 1923-24 ... | 50,533      | 453,761                 | 230 0 0                | 205 7 0     |

It will be seen that the profits realized during the year under report exceeded those of the previous year by over Rs. 4,000.

32. *Tinnevely chank fisheries.*—A total of 276,486 full-sized, 21,523 under-sized and 5,826 wormed shells were fished during the season under report, as against 311,826 full-sized, 36,493 under-sized and 5,468 wormed shells during 1922-23. Though successful financially, the season was a source of considerable strain and anxiety as the usual difficulty in securing divers was aggravated by an outbreak of plague at Tuticorin just at the time of fishing. The year was very unfavourable for the recruitment work and the divers refused to work at Tuticorin in spite of all inducements offered. The season advanced without bringing in divers and the fishery threatened to collapse. But for the Superintendent's plan of changing the headquarters of the fishery to Taruvaikulam 7 miles to the north of Tuticorin and free from the infection of plague, the fishery would have been a deplorable failure. This village has a good anchorage for small boats besides water and other conveniences. The divers came to this place freely though not in such numbers

as were anticipated. In addition to Kilakarai divers, there were some divers from Periapattanam and Tirupalakudi and one Arab and one Jaffna diver. The Tirupalakudi divers, though new to the place, did very well and secured invariably better earnings than the Tuticorin divers. Out of the total number of 276,486 full-sized shells collected, the Tuticorin divers were responsible only for 127,345 shells, the rest being brought in by the Kilakarai and other foreign divers.

33. The shifting of the camp to Taruvaikulam had another great advantage in disclosing the possibilities of the extensive virgin beds that lie to the north of Tuticorin. More than two-thirds of the shells were fished from these beds. The old beds Vaippar Peria Par and Kadayan Par also continued to be regularly fished. The beds off Tuticorin and Pinnakol were hardly touched, chiefly because fishing was difficult as the chanks were obscured by pearl oysters. The season opened on the 15th October 1923 and closed on 14th May 1924. Forty-two days were lost owing to bad weather and holidays as against 57 during the previous season.

34. As in the previous year, the men had good earnings and the average earning per head per day on the fishing days was Rs. 2-1-4 as against Rs. 2-2-0 during last season. On good days, the average earning went as high as Rs. 5 and the foreign divers were greatly satisfied at the results. This satisfactory state of affairs is due to the increased rate of one anna given to the men, but for which the foreign divers would not have turned up.

35. "Leverett" did the towing work for chank fisheries for most of the days. The number of canoes were too many for "Sutherland" and on days when strong head wind prevailed "Leverett" was also unable to tow and "Lady Nicholson" was utilized for the towage. Hitherto, outside tugs were being engaged at Rs. 100 or more a day during such days. By utilizing "Lady Nicholson" there was a saving of about Rs. 500. The following are the details of towing work done by the different vessels:—

|                         | Days. |
|-------------------------|-------|
| "Lady Nicholson" ... .. | 10    |
| "Leverett" ... ..       | 77    |
| "Sutherland" ... ..     | 43    |
| Total ... ..            | 130   |

36. A total of 40,378 shells below 2¼ inches in diameter were fished of which 18,855 were returned alive to the sea. This large increase in the number of shells returned is due to the stationing of divers away from Tuticorin, as the flesh could not find as ready a sale at Taruvaikulam as at Tuticorin.

Four hundred and thirty-eight shells were fished at Idinthakarai against 570 during last season. All of them were obtained from fishing nets.

37. The contract with the Dacca Chank Workers' Co-operative Society expired on the 30th June 1923 and they were given a renewal of the contract for two years and the rate was raised to Rs. 230 per 1,000 shells, a comparatively low rate, as there were offers from merchants as high as Rs. 280 per 1,000 shells. The Society was, however, given the advantage of a low rate in consideration of the fact that it was a union of chank workers organized by the Co-operative Department in Bengal to encourage the chank industry and that the actual workers would get the shells without the intervention of middlemen. The Society was subsequently liquidated as there were complaints that the Directors were pursuing a selfish policy and the Dacca Industrial Union who were appointed as liquidators have assumed the contract.

38. *Rāmnād chank fishery*.—A total of 177,275 shells were fished in the Rāmnād district as against 154,714 during the previous season. The details are given below:—

|                                          | 1923-24.       | 1922-23.       |
|------------------------------------------|----------------|----------------|
| 1. Rāmēswaram including Mandapam ...     | 88,390         | 111,906        |
| 2. Kilakarai including South Vedalai ... | 13,880         | 12,492         |
| 3. Tirupalakudi including North Vedalai- |                |                |
| patti ... ..                             | 75,005         | 30,316         |
|                                          | <u>177,275</u> | <u>154,714</u> |

39. The fall in the number of shells fished in Rāmēswaram and Mandapam was due to labour trouble. The divers were attracted to Ceylon beds close by where higher rates were being offered for the shells. The only way to induce the divers to remain on the Indian side is to offer them better wages by raising the rate offered per shell, and a proposal to raise the rate from one anna to one anna three pies as a permanent measure has recently been approved by Government. The number of shells brought in at

Tirupalakudi was a record one—71,972 shells against 27,001 during the previous season and an average of 30,844 for the last five years. This was the result of the increased rates paid to the divers with reference to the orders in G.O. No. 1132, Development, dated 9th August 1923. This again illustrates that much of the difficulty that is now experienced in the matter of divers will be removed by offering better rates.

40. The profits obtained from this fishery, after deducting Rs. 4,000 as the year's rental payable to the Raja of Rāmnād, amounted to Rs. 7,649 against Rs. 6,951 during the previous year. This is creditable in spite of the paucity of labour at Rāmēswaram and the grant of an increased rate of  $33\frac{1}{3}$  per cent for the Tirupalakudi shells.

41. One specially noticeable feature of this fishery during the year under report was the fishing of five Valampuri or sinistral shells, all of which were from the Tirupalakudi section. This is the first year in which such shells were fished after 1916-17 and this is the largest number fished during the past decade. The purchase price of the shells came to Rs. 198, but the selling price was fixed at Rs. 1,900. Four out of the five shells have been sold at the prices fixed. The remaining shell is somewhat wormed both at the apex and the end and the Superintendent hopes to dispose of this shell also by a slight reduction of the price fixed (Rs. 500).

42. As head wind prevailed on almost all the days in which fishing was conducted at Rāmēswaram the canoes had to be towed for 75 out of 76 days. "Leverett" did the towing work for 43 days and the "Pearl" for 32 days.

43. *Sivaganga fishery*.—This small fishery was responsible for a loss of Rs. 74-4-1. There are no divers, and diving which existed in almost all the fishing villages on the Sivaganga coast has died out as a profession, the chief reason being the absence of pearl fisheries for more than a decade either in Ceylon or in India.

3,033 shells were collected from fishing nets during the season under report as against 3,315 during the previous season.

44. *Advance to divers*.—A sum of Rs. 1,405-5-1 was outstanding on the 30th June 1923. A further advance of Rs. 1,461-4-0 was made during the year for the recruitment of divers for the Tuticorin and the Rāmēswaram fisheries. A sum of Rs. 1,202-0-9 was

recovered from the divers and Rs. 69-10-0 was written off being irrecoverable advances on account of the death of the divers. The balance outstanding at the close of the season, i.e., on the 30th June 1924, was Rs. 1,594-14-4. Most of the recoveries were effected at Tuticorin where the divers earned good wages.

45. *The leased chank fisheries*.—The amounts realized by the rented out chank fisheries of Tanjore, South Arcot, Chingleput and Nellore are given in paragraph 29. They call for no remarks.

46. *Beche-de-mer fishery*.—1,926 lb. were cured as against 855 lb. during the previous season. The running charges amounted to Rs. 610-1-3. The cured product is expected to fetch about Rs. 896-1-1, thus giving an estimated net profit of Rs. 286 according to the prices realized during the last occasion. The fishery is carried on only as an adjunct to the chank fishery to enable the divers to get sufficient earnings without enhancing the rates for chanks.

#### THE FISHERY FLEET.

47. The "Lady Nicholson" which has been retained for the combined use of the Revenue and Fisheries Departments was very useful in connexion with the inspection of pearl banks during the year under report. She will also be required during the forthcoming pearl fishery. She was employed during the year to some extent in towing chank canoes at Tuticorin when strong head winds prevailed. She was not employed for the Laccadive inspection in the year under report.

The "Leverett" and "Sutherland" were also in constant use throughout the chank fishery. They did towing work for 120 days and 73 days, respectively. Besides towage work, the "Sutherland" was utilized as an experimental measure for transporting 100 maunds of salt to the fish-curing yards near Tuticorin. The Superintendent proposes to utilize this vessel for this work much more in future as considerable economy in transport charges would thereby result.

The launch "Pearl" was as usual serviceable in chank fisheries conducted in the outstations of the Rāmnād district.

The new launch "Sea-Scout" was placed in charge of the Superintendent after the deep-sea fishing experiments were brought to a close owing to the utter unsuitability of the boat for

that purpose. The inquiries resulting from the advertisement for the sale of the "Sea-Scout" have not so far resulted in its disposal.

#### MISCELLANEOUS.

48. *Law suits.*—A sum of Rs. 765-8-9 has yet to be recovered from Messrs. Dutts on account of the Tinnevely contract. Regarding the decree in the Rāmnād suit for Rs. 11,062-11-5 against godown rent and interest, Messrs. Dutts have appealed to the High Court.

#### RESEARCH.

49. It is a well-known fact that pearl fisheries in India have occurred only at long intervals extending up to even 30 years. An abundant spat-fall which may eventuate in a fishery after the growth of a sufficient number of oysters on the banks is at present left entirely to fortuitous natural causes. We are entirely in the dark as to the causes which prevent spat-fall or the abundant growth of oysters during the long intervals. The causes attributed by some to unfavourable chemical and physical conditions of sea water are largely conjectural, while the reported destruction due to the natural enemies which prey on oysters, and sand or mud drift which smother oyster beds is based on extremely meagre observations made. The determination of the exact cause or causes is essential before remedial measures could be concerted, and the financial advantage of such an investigation which may result in securing more frequent pearl fisheries than have occurred in the past is obvious.

With the establishment of the Marine Biological Station at Krusadai, I hope to initiate preliminary experiments and research along these lines.

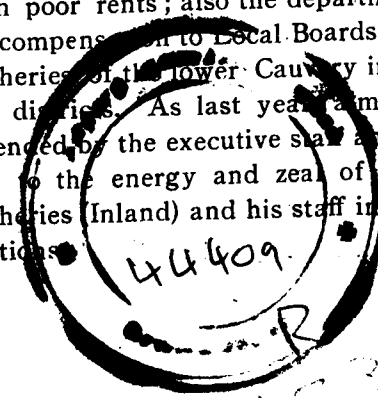
The scientific control of chank fisheries and their cultivation to cope with increased exploitation is a feature of chank work to which little attention has been paid in the past. A good beginning has been made in returning undersized chanks collected by divers to the beds. As many as 18,855 such shells were returned during the year under notice. The location of suitable growing grounds for the planting of young shells and the starting of new chank beds required investigation.

The labour problem connected with chank diving is perhaps the most difficult and troublesome to be solved. The attitude of divers, their ideas and ideals are all rapidly changing. Diving is considered undignifying and the sons of divers no longer follow the profession of their fathers. Diving with a regular modern equipment, I understand, was tried years ago, but was found unsuitable for the work. If a lighter form of equipment such as the pearl divers in Japan have recently adopted could be tried, we may finally solve the ever increasing labour difficulties which confront the fishery. A definite number of divers could then be trained and enlisted on the permanent establishment of the department. I am making inquiries in Japan regarding the new pattern diving dress.

#### INLAND PISCICULTURE.

50. *General.*—The effect of the policy of drastic retrenchment adopted during the year was felt more keenly in this than in any other section. Many promising new schemes had to be held over for financial reasons and the year's record consists only of routine operations and no distinct advance over the previous year. Scarcity of rain in the districts where the department conducted piscicultural operations further hampered its work and materially reduced the revenues derived from tanks and rivers.

The total receipts from inland fisheries during the year amounted to Rs. 1,13,382-8-5 and the total expenditure inclusive of full supervision and capital charges was Rs. 97,028-10-11. The net profits for the year therefore were Rs. 16,353-13-6 against Rs. 20,450-13-5 in the preceding year. Financially the year's record is not so favourable as that of last year for obvious reasons. While there were floods in the Northern Circars, Tinnevely and South Kanara; in Nellore, Chingleput, Salem, Coimbatore, North and South Arcot and the Ceded districts drought conditions prevailed which resulted in poor rents; also the department had to pay Rs. 4,167-13-0 extra compensation to Local Boards on account of the newly acquired fisheries of the lower Cauvery in the South Arcot and Trichinopoly districts. As last year almost all the important sales were attended by the executive staff and the satisfactory returns are due to the energy and zeal of the Acting Assistant Director of Fisheries (Inland) and his staff in organizing sales and stocking operations.



51. *Tank-stocking operations.*—The scheme for the acquisition of tanks in Ganjam was not proceeded with and, judging from the Government orders recently passed, the scheme appears to have been postponed indefinitely. The tank-stocking scheme is feasible only in districts that abound in tanks and reservoirs. Of such there are only 15 districts in the Presidency and in eight of them the department already controls several important tanks and channels. Of the remaining seven, Ganjam and Madura possess innumerable perennial water tanks and it is desirable to acquire and develop them at the earliest opportunity.

The stocking of tanks and rivers under the department's control with improved varieties of fish was carried out as in previous years. In pursuance of the scheme for the improvement of the Cauvery fisheries initiated in 1921, 700 fingerlings of the large carp, catla, from the Northern Circars were introduced into the Cauvery below the Hoginkal falls. Many tanks and canals were also stocked with the estuarine food fish *Etroplus suratensis*.

Arrangements are being made to stock the Kodi and Kotakiri tanks in South Kanara with the fingerlings of chanos (milk fish) and auction the full-grown fish from the tanks periodically. This highly priced fish is extensively cultivated and marketed in Java and the tanks mentioned above offer facilities for making a beginning in this industry.

#### FISH FARMS.

52. The three fish farms, Sunkesula (Kurnool), Ippur (Nellore) and Powder Factory (Madras) and the Larvicidal Farm at Praema (Kurnool) worked satisfactorily during the year. The Vellore Fort Moat Farm was handed over to the department formally on 5th October 1923.

53. *Sunkesula fish farm.*—For the first time, gourami was placed in the Kurnool market for sale and 37 old breeders were sold for Rs. 42-7-6. Carp and murrel grown in the Edurur swamp for market purposes were sold for Rs. 145 against Rs. 500 in the previous year, but there are yet on hand 350 murels which will fetch about Rs. 100. The decrease in the catch is partly due to the failure of rains and partly also to the gradual silting up of the Edurur swamp. Due to inadequate water-supply from the Tungabhadra during the dry weather and the high cost of pumping water to the ponds fully explained to Government—vide

correspondence, in G.O. No. 1262, Development, dated 22nd September 1922—no room is available in the farm except at prohibitive cost for its rapidly increasing stock of fish, especially to accommodate the valuable gourami which breeds very successfully here. It was to tide over this difficulty that the construction of a few more ponds at Praema was recommended. This proposal was, however, negatived by Government for financial reasons. The proposal has again been sent up as one of the urgent new schemes this year for consideration in connexion with the budget for 1925-26.

54. *Ippur fish farm.*—Though a large head of larvicidal fish was maintained there was no demand for them for anti-malaria stocking purposes from local bodies.

Surveyalli Reservoir this year also did not receive an adequate supply and in consequence the farm was threatened with scarcity of water, but fortunately the timely filling of the ponds when water was available averted the danger of their drying up completely.

The Hon'ble the Minister for Development paid a visit to the farm on 30th January 1924.

55. *The Powder Factory fish farm.*—The available room for fish here is extremely small. For instance, there is only a single pond of fresh-water roughly 8,625 square feet in area for gourami, and the rapid increase in their number has necessitated the search for additional ponds in Madras. The extensive ditches in the abandoned Government brick fields at Chetput seemed to offer opportunities, but the Public Works Department in their memorandum No. 79 Wks., B-21/10, dated 29th November 1922, did not see their way to consider my predecessor's proposal to preserve these ditches for breeding fish. I am, however, investigating the matter further.

56. *The Vellore Fort Moat farm.*—The farm after completion was handed over to this department on 5th October 1923. Owing to the prevailing drought conditions this year, the moat did not receive sufficient supply of water and in consequence it could not be stocked heavily. About 1,500 *etroplus* were introduced in the year 1922-23 in the two sections which held water. These however grew remarkably well and multiplied profusely. As the moat began to dry up during the hot weather the fishery was auctioned and the handsome amount of Rs. 2,007-14-6 was realized.

When the moat scheme was prepared it was considered that the storm water of the Vellore town and the surplus water of the

Suryakulam tank would be adequate to fill the moat. Due to the failure of rains the supply has been found quite insufficient. To ensure an adequate supply to the four sections of the moat, arrangements are being made to divert the surplus waters of the Nakkal kalva also into the moat. Years ago, the waters of this channel were diverted into the moat by means of a stone dam thrown across it. Since the dam has fallen into disrepair, water ceased to flow into the moat; the dam is being restored with the Collector's permission, at a cost of Rs. 340, and it is hoped that the diversion will provide sufficient water in the moat all the year round.

57. *Praema larvicidal fish farm.*—During the year fifty-one water holes of the Nallamalais were stocked with 19,400 larvicidal fish from this farm.

58. *Chingleput Fort Moat fish farm.*—Owing to constructional defects, the farm could not be worked. Proposals have been submitted to Government for the sanction of a sum of Rs. 5,400 to rectify the defects. The moat, however, is being cleaned and stocked with larvicidal fish to keep down malaria in the Reformatory School situated within the fort.

59. *Mopad fish farm.*—The farm was not handed over to the department during the year under report. Recently on receipt of an intimation from the Executive Engineer, Nellore, stating that the work had been completed and that the farm might be taken charge of, I inspected the farm and found that there were serious defects in its construction. I was not, therefore, able to take charge of the farm.

Deep-water fishing was conducted throughout the year in the reservoir and a sum of Rs. 757-11-7 was realized against Rs. 421-9-11 in the previous year. The increase was due to the improvements effected in the methods of capture from the experience gathered in the previous year. The income would have been greater during the year, had not the Assistant Inspector and staff been disabled for over three months by a severe attack of malaria. Relief was obtained only after several injections, which in an isolated locality miles away from the nearest hospital was not easily procurable.

As the Mopad fish farm is situated in a locality sparsely populated, great difficulty is experienced in the disposal of fish caught in the reservoir. The people are so very poor that they are unable to make cash payment at once. The only market is Pamur which is

about five miles from the farm. The nearest big markets are Udayagiri and Kanigiri and as these are more than 16 miles from the farm the fish get tainted in the hot weather by the time they reach the consumers. At times fish are brought back unsold. The problem of finding ready sales for fresh fish is, however, engaging the attention of the Department.

The barrier wall which was specially constructed across the Manneru to prevent fish from the reservoir going up the river during freshes is in a damaged condition and enables fish to escape when the river is in spate. As this wall is very important for piscicultural operations the Executive Engineer has been requested to repair the dam at an early date.

60. *Kanigiri Duvvur scheme.*—No progress has been made with the scheme, pending orders on the Retrenchment Committee's recommendations—vide Proceedings of the Public Works (Irrigation) Department No. Mis. 295 I., dated 8th November 1923. The scheme is practically an experiment in deep-water tank fishing to ascertain the methods, nets, etc., for regularly fishing *throughout the year* tanks with deep and more or less permanent water. In view of the fact that this reservoir is silted up and has been running dry more or less completely during recent years, it is doubtful if the contemplated experiments in deep-water fishing should be conducted here. Further, such experiments are being conducted in the Mopad reservoir. The scheme may in all probability have to be abandoned. I shall submit my proposals on the subject separately.

61. *Anti-malarial operations.*—Besides the work done on the Nallamalais with *Praema* as a base, the Peddagadi pool and the Pullamadugu in Cuddapah were stocked with 2,000 larvicidal fish. The fish introduced in the previous year appear to have survived in the pool. The Bugga river should now get itself automatically stocked.

#### EXPERIMENTS AND RESEARCH.

62. *Gourami* continue to thrive and multiply in the three farms, Ippur, Sunkesula, and Powder Factory. Mopad and Chingleput farms are not yet ready to receive them and Vellore moat had not sufficient water. Want of space for this rapidly

increasing stock is very keenly felt in Sunkesula and the Powder Factory farms where this fish thrives well. The fish are allowed to breed in a natural way in ponds specially selected and planted with lotus and other varieties of water lily which form the familiar food of this fish. In view of the limited space available no experiments for the artificial and selective breeding were made. Till relief is obtained by the construction of extra ponds at Praema no such attempts could be made. The public have begun to evince an interest in this fish. Mr. Khader Nawaz Khan purchased 6 *Gourami* for breeding purposes and H.E.H. the Nizam's Government want some 200 *Gourami*: there were also inquiries from some of the planters on the Anamalais. There is obviously a great future for it and it is hoped that the new fish farms under construction when handed over to us will provide facilities for breeding and distributing this valuable fish.

63. *Etioplus suratensis*.—This variety which accommodates itself to fresh-water conditions, bred prolifically in the artificial nests which I had devised in 1918 for them in the fish farms at Sunkesula, Ippur and the Powder Factory. The fry from these farms were transferred as usual to the several inland tanks and canals under the Department's control. As a result of the successive stocking operations, *Etioplus* have been established in many tanks in the districts of Bellary, Salem, Chingleput, Kurnool, Nellore and Anantapur. They were introduced into the Vellore Fort Moat farm where also they grew and multiplied very rapidly. The public, accustomed to the coarse and bony tank fish, have learnt to relish *Etioplus* so highly that when a section of the moat at Vellore was fished recently, they purchased the young ones alive for introduction into their wells and ponds.

64. *Mullet*.—The fry from estuaries were employed as usual in stocking a large number of tanks in the Nellore and the Chingleput districts. As an experiment mullet fry three inches in length were introduced on 23rd January 1923 into the Vellore Fort moat; in the last week of March 1924 after 14 months they were found to have attained a length of one foot. This demonstrates that suitable varieties of mullet fry thrive in fresh water and grow to marketable size in about a year. In Egypt an extensive trade in the cultivation of mullets obtained as fry from estuaries and backwaters has developed within the last two or three years. The fry being

abundant along the coast they afford ready material for stocking tanks in the sea board districts of the Presidency.

65. *Catla catla*.—The fry of this large carp were introduced in the Mopad reservoir in 1921-22. Some striking evidence of the results of this stocking has just come to hand. An adult catla was recently caught in the reservoir and weighed 41½ lb., its length being 36½" and breadth 14½". At the time of their introduction from the Gōdāvari they were about 4 to 5 inches in length and weighed only a few ounces. The fact that in the course of two years and 9 months one of them has put on a weight of 41 lb shows the extraordinary rate of growth. Another catla is reported to have been caught in the Manneru river during the last north-east monsoon floods near Chenampalli village, a place nearly 16 miles above the barrier wall across the river.

66. *English Tench and Carp*.—Tench which were introduced into the Sunkesula farm in 1915 started to breed in 1921. English carp which were introduced into the Sunkesula farm on 21st February 1923 showed no sign of breeding; they have however grown appreciably; at the time of introduction they measured between 1" to 1¼" and now measure 8" to 9". It is still too early to predict whether they will breed in the waters of the plains though the signs are hopeful.

67. *Small scale pond-culture*.—The Department by prolonged experiments on the breeding and feeding of the better class fresh-water fish *Etioplus*, *Gourami* and *Tench*, is now in a position to supply stock and advise landlords and small scale capitalists in the cultivation of these fish in their own ponds for the table or the market. A suitable handbook for such small scale culturists is now under preparation.

68. *Deep-water fishing*.—Experiments in this direction were continued in the Mopad reservoir. The increased catches were due to improved methods of fishing. The stumps of submerged trees in the bed precluded any extensive use of trawl or drag nets. But a method of fishing largely employed in backwaters, such as Ennur, seems highly suitable and will be tried with fishermen recruited at Ennur. Mopad is a recent project and holds a depth of 24 feet of permanent water below the sill level of the outlet and affords unique opportunities for experiments in deep-water fishing which have already yielded satisfactory results.

69. *Shells for button-making*.—When recently on tour at Mopad I found a variety of *Lamellidens*, the common fresh-water mussel, the shells of which were unusually thick and shiny and suited for button-making. Specimens of these shells were sent to the Button-making Expert, Mr. T. Mustaphi, in Madras, for examination; he has pronounced them to be eminently suited for the purpose. Mopad being so out of the way the question whether it will be possible to supply the shells at Madras cheap enough for button-making is being examined.

#### MISCELLANEOUS ACTIVITIES.

70. *Co-operative societies*.—The Co-operative Society of the fishermen of Humpapuram which has taken on lease the fishery of certain sections of the Cauvery in Kollegal taluk continued to work satisfactorily. The Co-operative Society formed for the benefit of the fishermen at Lower Anicut appears to work well. In the Kurnool district a society has been formed in the Kontallapad village near the Sunkesula fish farm and the question of leasing out to the society the fishery of certain tanks and the Kurnool-Cuddapah canal is under consideration. The benefit of co-operation was preached to fishermen of Nandyal, Cumbum and Markapur, but it will take some time before societies are formed there. The fishermen of the Bhavani town have expressed their willingness to form a society and the Assistant Registrar of Coimbatore is taking necessary steps in the matter. The fishermen of the Nellore district are very conservative and it has not been found possible so far to induce them to form societies.

71. Dr. Schmidt of Copenhagen was supplied with specimens of fresh-water eels, and several persons, notably Messrs. Cotton and Simons of Anamalai tea estates and the Palni Game Association were furnished with information on fresh-water fish culture.

#### PUBLIC FISH-CURING YARDS.

72. *General*.—On the bifurcation of the old Salt and Abkari Departments from 1st April 1924 all the public fish-curing yards in the Presidency were transferred to the Fisheries Department. The Government of India declined to contribute any portion of the expenditure on fish-curing yards beyond remitting the duty on the salt supplied. The Salt Department therefore relinquished the yards as a losing concern while the Excise Department was

not concerned with either fish-curing or supply of salt. Their transfer to the Fisheries Department has made a very welcome addition to the staff of the department. Twenty-six permanent yard officers, 35 permanent petty officers and 215 permanent peons are now stationed all along the coast at convenient intervals in the midst of large fishing villages. The department has therefore acquired that machinery and intimate touch with the fishermen and fishing industries for which it has been asking and which its meagre finance could not afford hitherto. Besides the direct work of issuing salt for curing purposes, the department will now set itself to train these men into expert advisers in the art of curing and marketing fish, social workers for the inculcation of thrift, co-operation and, if possible, dissemination of progressive ideas and new industries that the department will be in a position to impart from time to time. Besides, with a properly trained staff in hundred and odd yards situated in the most important fishing centres it should be possible 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 occurrence, abundance, breeding and other habits of the more important edible sea fish. As most of the staff transferred with the yards are men in advanced age with a life training in the Salt Department and no wider outlook than the safeguard of revenue, they are least susceptible to new ideas; much patience and skilful handling are required if any of them are to become instruments for the education, development and socio-economic emancipation of the backward and conservative fishermen communities. I am afraid the hope lies entirely with the future generation of officers whom the department will train.

73. There were only 11 fish-curing yards under the management of this Department at the commencement of the year. Two more yards were opened during the year, one at Kaipamangalam and the other at Uppala, and from 1st April 1924 the remaining 94 yards in the Presidency were taken over. The yards were tentatively distributed among subordinate officers as follows. The 52 yards on the West Coast are under the supervision of the Assistant Director (Coast). The Assistant Director (Inland) was placed in charge of the 11 yards in Nellore and Chingleput districts and the Superintendent, Pearl and Chank Fisheries, in charge of the 14 yards in Tanjore, Rāmnād and Tinnevely districts. The 29 yards

(inclusive of a temporary yard for six months at Pukkilipetta) in the Northern Circars were placed in charge of a Sub-Assistant with headquarters at Vizagapatam. The Government have since sanctioned the opening of a yard at Kizhoor near Kasargode on the West Coast. The total number of fish-curing yards in the Presidency is 107. In April 1923 Annappa Markala of Mooduthonse was permitted to open a private fish-curing yard at Paduthonse. The applicant has not yet got possession of the site and in the meantime has been granted a ticket at the Malpe I yard.

74. In addition to the Salt Assistant Inspector, Mr. A. Ramunni Menon, the services of an additional Assistant Inspector of Salt were obtained from 1st April 1924 when all the other yards were transferred to Fisheries. All yard officers and assistant yard officers newly appointed to the fish-curing yards on the West Coast underwent the usual course of training in improved methods of curing, etc. at the Tanur Experimental Station. Some of the yard officers who were transferred from the Salt Department to the Fisheries Department seem to labour under the grievance that their prospects have suffered by the transfer. Many of them want to go back to the Excise Department and a few have recently been so transferred.

The utmost economy was exercised in providing for the Executive and clerical staff for administering the yards as it was considered unwise to ask for a large staff pending experience of the work. The last six months have shown the emergent need for additional staff and accordingly I have submitted proposals to Government separately on the subject. The chief need seems to be a reserve staff for relieving officers applying for leave. Many of the men transferred from the Salt Department are old and on the verge of retirement. They are constantly applying for leave on account of ill-health, etc., and as most of the peons transferred are illiterate great difficulty is experienced in finding substitutes for leave vacancies. Without the additional staff asked for it will be impossible to carry on the administration of the yards.

75. The total quantity of fish brought into the 13 yards which were under the control of the Fisheries Department prior to 1st April 1924 was 399,277 maunds, as against 355,914 maunds in the previous year. The cured weight was 238,909 lb. as against 208,202 lb. in 1922-23. The total quantity of salt issued was 59,117 maunds as against 47,071 maunds in the previous

year. 38,912 gallons of filtered brine were used during the year and the fish cured with it was 7,695 maunds as against 37,973 gallons and 8,299 maunds of fish cured during the previous year.

As regards the yards transferred from the control of the Salt Department during the period between 1st April and 30th June 1924 88,139 maunds of fish were brought to the yards and 13,561 maunds of salt were issued. The transactions in the yards have been generally poor as this is the slack season for fishing. It is also reported that the raising of the issue price of salt to Rs. 1-4-0 from 1st April 1924 has had an adverse effect on the transactions, but it is really too early to judge; the actual effects can only be gauged after a complete season.

76. *Finance.*—The Government have in G.O. Mis. No. 764, dated 12th April 1924, asked me to submit a report on the feasibility of making the fish-curing yards self-supporting after I have had experience of its working for a year. I shall submit a detailed report on the subject before 30th June 1925 as desired. The main item of expenditure in the fish-curing yards' budget is Rs. 1,99,000 (budget figure for 1924-25) for the purchase and transport of salt to the West Coast yards. The West Coast yards consume the largest quantity of salt and in the absence of salt factories all the salt has to be transported to the West Coast from Tuticorin and Kayalpatnam which are the nearest factories, and also from Madras and other East Coast factories by rail occasionally when sea transport fails. The sea transport has been hitherto done by contractors at Rs. 12½ per ton of salt. The delay, inconvenience and loss of salt in sea transport by contractors has been considerable. I find that if transport were done departmentally by employing vessels which the department has to maintain for other work an economy of ½ a lakh and more will result. Accordingly I had submitted to Government detailed proposals for the purchase of a steam trawler for the economic and rapid transport of salt from Tuticorin to the fish-curing yards on the West Coast and in consequence the Master Fisherman was deputed to England for selecting a trawler for purchase. He selected a trawler for £2,000. If the highly favourable condition of the market for the purchase of fishing craft had been availed of the Government could have secured a trawler for 1/8 or 1/12 the actual cost, both for the economic transport of salt to the fish-curing yards and for fisheries work generally. *Vide*

correspondence ending with my letter No. 1039 F/24-22, dated 1st October 1924. The Government have however abandoned the scheme.

77. *Curing sheds and utensils.*—All the curing sheds in the yards at Malpe, Thannirbhavi, Adakathbail, Madapalli, Melady, Uppala-Kaipamangalam, Thalayi and Calicut and Mangalore (with the exception of a few belonging to poor women curers at Mangalore) are of the improved hygienic model with cemented floors, vats, brine pits, filters, etc. An advance of Rs. 25 each has been sanctioned to four of the curers at Mangalore to enable them to remode their sheds. Sanction has already been obtained for granting a loan not exceeding Rs. 150 to each of the ticket-holders at the Cannanore yard. At Tanur North yard 17 pucca sheds have been put up and four more are under construction. A large number of curing sheds in South Kanara, which were under the control of the Salt Department, and a few on the Malabar coast, are pucca structures with cemented floors and salting troughs. The sheds in most of the yards in the Northern Circars had suffered severe damage during the cyclone of 1923 and some of the West Coast yards have suffered from unusual floods and sea erosion. Attempts are being made to rebuild them.

78. The year was on the whole disappointing for the fishing and fish-curing industry on the West Coast. Big shoals of mackerel and larger kinds of fish were practically absent. The unprecedented rains, which fell in South Kanara district in August 1923 affected the Mangalore fish-curing yard, where 752 maunds of duty-free salt got dissolved in water. A consignment of 350 bags of salt sent to these yards from Tellicherry was upset just off the yard on account of rough sea and a quantity of 29 maunds was thus lost. These quantities have been written off. A deficit of 202 bags of salt was discovered at the Malpe I fish-curing yard when fish-curing operations commenced in November. The matter is under investigation.

#### DEEP-SEA FISHING.

79. A novel feature of the year's work is the initiation of fishing experiments with the Danish seine net. For the first time the Department's proposals for the introduction of Western methods of fishing materialized and the motor launch "Sea Scout," referred to in the administration report of last year intended for deep-sea



The Sea Scout.

fishing experiments arrived in India in October 1923. Captain Cribb, the Master Fisherman who was engaged to conduct the experiments, carried on experimental seine net fishing at Cochin. The launch, however proved a great disappointment from the outset, as it was found quite unsuitable both in design and equipment for the purpose for which it was purchased, with the result that the experiments had to be terminated in March last and the launch had to be advertised for sale. The failure of the experiments was due solely to the defects of the launch as pointed out in my letter to Government, No III-M/24-3, dated 12th March 1924, and in no way proves the unsuitability of the Indian waters for deep-sea fishing. On the other hand most valuable knowledge was gained of the nature of the fishing grounds lying off the West Coast which could be turned to good account in future work. I had accordingly suggested to Government the purchase of a Danish cutter to conduct the experiments. This proposal was unanimously supported by the Fisheries and Industries Advisory Committee. But Government have abandoned the scheme along with the proposals for the purchase of a trawler.

The expenditure incurred on the experiments, apart from the cost of the launch, was Rs. 12,072.

80. In 1921-22 the Bombay Government at a cost of Rs. 4,88,000, carried out deep-sea trawling in Bombay. Though Government experiments were not a financial success they disclosed possibilities sufficiently attractive for a private firm to purchase a trawler for deep-sea fishing in Bombay and the "Grey Sea" is expected to arrive in Bombay shortly. Early this year the Ceylon Government have bought a trawler for pearl bank inspection and deep-sea fishing experiments in grounds untouched by Ceylonese fishermen, the most extensive of which is the "Wadge Bank" off Cape Comorin which properly belongs to this Presidency as it adjoins India and is about 18 hours steaming from Colombo. The newly formed Fisheries Department of Malay States have prepared an attractive exhibit for the British Empire Exhibition to display the opportunities that exist for the investment of capital and enterprise to develop the valuable Malay fishing grounds with the aid of modern appliances. In view of the great awakening in these sister States the initiation of experiments in deep-sea fishing on modern lines by the Madras Government who have been all

along pioneers in developing the fishing industry in India was most opportune. With the acquisition of a full-sized trawler such as I had proposed for the transport of salt, and a new Danish cutter, the Madras Fisheries Department would have been behind no other in India as regards its equipment for deep-sea work. As it is, however, other Governments will exploit the Madras fishing grounds and the Department will be helpless having been deprived of the means of fishing the banks.

### THE MARINE AQUARIUM.

81. The aquarium on the Marina continued to maintain its popularity during the year under report. The number of visitors, however, slightly diminished from 102,349 to 95,800, apparently due to the breakdown of communications caused by the cyclone and floods in South Kanara, Tinnevely and the Northern Circars. The record attendance was as usual on Kannu Pongal day (16th January 1924) when 4,007 people visited the aquarium against 4,135 in 1922-23. His Excellency the Viceroy visited the aquarium on 11th December 1923 and among the other distinguished visitors were Sir Charles Eliot, Sir K. V. Reddi, the Hon'ble the Resident in Mysore, Mr. Bhupendranath Basu, Dr. Annandale and a party from the Government House. The receipts from all sources amounted to Rs. 8,933 against Rs. 9,461 during the previous year.

82. In pursuance of the policy of retrenchment adopted during the year under report, the Sub-Assistant in charge was withdrawn from the aquarium towards the middle of the year and the aquarium came under my direct charge. The expenditure during the year amounted to Rs. 7,298 including 25 per cent of the pay of the Zoological Assistant and his peon for the period they were on duty at the aquarium. The receipts exceeded the total expenditure by Rs. 1,635. 1,273 copies of the revised edition of the English and 277 copies of the Tamil guide were sold during the year. 330 sets and some loose cards of the first set of coloured picture postcards depicting the Pomfret, Puffer Fish, Leather Jacket Electric Ray, Dhoby's Wife and Spotted Perch were sold during the year. A second set of cards representing the Half Beak Hammer-headed Shark, Indian Mackerel, Indian Dorab, Seer and Russel's Scorpion Fish was issued during the year and was put on sale at the aquarium towards the end of May. Fifteen sets and some loose cards of this set were sold before the end of the year.

The aquarium has also been useful in advertising the canned goods of the Government Cannery at Chaliyam and it is reported that the demand for such goods kept for sale there is on the increase.

83. No efforts were spared to maintain, and, where possible, to increase, the number and variety of the exhibits in the aquarium, and a new arrangement for the exhibition of delicate organisms such as jelly fish, etc., is being tried. The restricted space in the aquarium does not, however, allow any scope for putting up any further exhibits and it is under contemplation to convert the present unused turtle tank into four big sea-water tanks to exhibit the large fish in No. 10 tank which have been in the aquarium ever since it was started and which have grown too large for the tank. With a view to economy and efficiency, improvements were carried out to the system of water circulation in the aquarium whereby expensive pumping by coolies was replaced by gravity flow. This will result in a saving of Rs. 432 a year. A new system of aeration is under trial which, if successful, will enable the Department to do away with the present system of air pumps and labour involved in pumping.

### FISHERY RESEARCH.

84. Research which would help eventually to solve the mysteries connected with the appearance on our coast of the oil sardine and mackerel, the two economically important shoaling fish of this Presidency, was initiated in November 1921 at Calicut. The preliminary investigation in oil sardine reached a provisional stage. The results have been published in Fisheries Bulletin No. 17, Report No. 5, under the joint authorship of Messrs. Hornell and Ramaswami Nayudu in June 1924. The stage reached and the conclusions arrived at represent a great step in advance, though admittedly tentative, as the data refer to observations from shore over a single year. The correlation of the movements of shoals visiting inshore waters with the abundance or absence of certain food organisms in the plankton and their dependence on currents, winds and weather conditions should be continued for several years if the conclusions drawn are to be fully confirmed. The record of these valuable data continues to be systematically collected at Calicut by Mr. S. T. Moses, the Zoological Assistant, who was shifted to Calicut

on the reorganization of the Marine Aquarium. Mr. Ramaswami Nayudu however had to be posted to Vizagapatam, where he would continue observations on sardines of the East Coast. The observations on mackerel continue to be inadequate due to the comparative scarcity of that fish at Calicut since 1921. In the year ending 30th June 1924 only 70 odd specimens were available for examination as against 7,281 sardines. Till more material is available the research on mackerel would not yield definite results. Mr. Jayaram Nayudu engaged on this part of the research has been devoting attention to further work on plankton and assisting Mr. Moses in the collection of data for sardine. In paragraph II of G.O. No. 1491, dated 22nd August 1924, Government have called for a definite programme which I would propose to carry out in the course of the next ten years. I shall accordingly draw up and submit for the approval of Government a programme of Fisheries research.

#### BIOLOGICAL SPECIMENS AND OYSTER SUPPLY.

85. The biological specimens and oyster supply sections consolidated their position most satisfactorily during the year ending 30th June 1924. In view of the fact that the specimen supply is an all-India concern, my predecessor suggested in his administration report for last year that the Educational department of the Imperial Government might be asked to contribute a sum of Rs. 3,000 annually to make this section self-supporting. But the Government in paragraph II of G.O. No. 1590, Development, dated 2nd November 1923, considered that there were not sufficient grounds to request the Government of India to subsidize this work and expressed the opinion that other efforts should be made to make the work self-supporting. In paragraph 5 of that Order the Government asked the Director to consider the advisability of avoiding any risk of loss in future on oyster supply by slightly increasing the price of oysters. Reorganization proposals to shift the oyster supply headquarters to Ennur, to abolish the post of Overseer and to combine the oyster supply with the zoological supply section were made by me in paragraph 6 of my letter No. 1597-G/23-2, dated 12th October 1923, read in G.O. No. 1491, dated 22nd August 1924, and in my letter No. 453-B/24-1, dated 5th March 1924, approved in G.O. No. 808, Development, dated 23rd April 1924. The two sections were

accordingly amalgamated in January last to mutual benefit and the result has been that both sections have worked to profit. The biological supply section has been made entirely self-supporting and showed a credit balance of Rs. 435-7-1 while the oyster supply yielded a comparatively large profit of Rs. 332-1-8. In future reports the oyster and biological supply sections will be dealt with as a single section.

#### BIOLOGICAL SUPPLY.

86. It is gratifying to report that this section has been made entirely self-supporting this year. The rapid progress in the supply of specimens for teaching and museum purposes continued to be maintained and the value of specimens sent out reached the unprecedented sum of Rs. 5,393 against Rs. 4,740 in the previous year. With the many demands upon my time I was able to visit the Ennur Laboratory twelve times, and the result is therefore very satisfactory. I am glad to place on record the zeal and untiring devotion to work displayed by the Sub-Assistant, Mr. Ramaswami Ayyangar, and his staff but for which success could not have been achieved. I have to devote some attention to the much needed work of identification of specimens and description of suitable types for zoological class work. A new price list is now under preparation.

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

#### *List of supplies of zoological specimens during 1923-24.*

|            |     |                            |     |     | RS. | A. |
|------------|-----|----------------------------|-----|-----|-----|----|
| Agra       | ... | Agra College               | ... | ... | 142 | 6  |
| Do.        | ... | St. John's College         | ... | ... | 268 | 10 |
| Aligarh    | ... | Muslim University          | ... | ... | 275 | 10 |
| Amritsar   | ... | Khalsa College             | ... | ... | 58  | 6  |
| Allahabad  | ... | Allahabad University       | ... | ... | 890 | 15 |
| Bangalore  | ... | Central College            | ... | ... | 189 | 12 |
| Benares    | ... | Hindu University           | ... | ... | 40  | 0  |
| Bombay     | ... | Natural History Society    | ... | ... | 37  | 12 |
| Do.        | ... | Royal Institute of Science | ... | ... | 313 | 4  |
| Calcutta   | ... | Calcutta University        | ... | ... | 16  | 12 |
| Do.        | ... | Medical College            | ... | ... | 7   | 0  |
| Kapurthala | ... | Randhir College            | ... | ... | 81  | 8  |
| Karachi    | ... | Victoria Museum            | ... | ... | 73  | 0  |

|                                             |     |                           | RS.   | A. |
|---------------------------------------------|-----|---------------------------|-------|----|
| Lahore...                                   | ... | Punjab Veterinary College | 67    | 8  |
| Do.                                         | ... | Dyal Singh College        | 209   | 4  |
| Lucknow                                     | ... | Lucknow University        | 402   | 15 |
| Do.                                         | ... | Isabella Thoburn College  | 165   | 12 |
| Nagpur                                      | ... | Hislop College            | 104   | 0  |
| Do.                                         | ... | Central Museum            | 34    | 8  |
| Poona                                       | ... | Fergusson College         | 121   | 0  |
| Rangoon                                     | ... | University College        | 133   | 14 |
| Do.                                         | ... | Judson College            | 107   | 8  |
| Srinagar                                    | ... | S.P. College              | 207   | 4  |
| Pudukkottai                                 | ... | State Museum              | 251   | 10 |
| Trivandrum                                  | ... | Maharaja's College        | 57    | 6  |
| British Empire Exhibition                   | ... | ...                       | 542   | 12 |
| Molluscan shells cases for 11 high schools  | ... | ...                       | 479   | 14 |
| Other Madras institutions and miscellaneous | ... | ...                       | 112   | 7  |
| Total                                       |     |                           | 5,392 | 9  |

It will be observed that as usual the bulk of the orders came from Universities and Colleges in Northern India.

The finances of this section during the year under report were:—

*Expenditure.*

|                                                                                                                                                                                                                                                             | RS.   | A. | P. |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|----|
| Salaries of establishment (exclusive of 25 per cent of the Senior Operator's pay for 5 months which is debited to oyster supply and the clerk's pay which is wholly debited to the Director's office) vide G.O. No. 808, Development, dated 23rd April 1924 | 2,700 | 5  | 0  |
| Travelling allowance                                                                                                                                                                                                                                        | 273   | 1  | 0  |
| Collection, materials and miscellaneous charges                                                                                                                                                                                                             | 1,983 | 11 | 11 |
|                                                                                                                                                                                                                                                             | 4,957 | 1  | 11 |

*Revenue.*

|                                        |       |   |   |
|----------------------------------------|-------|---|---|
| Value of zoological specimens sent out | 5,392 | 9 | 0 |
| Profit in working                      | 435   | 7 | 1 |

The section worked to a profit of Rs. 435-7-1 against a loss of Rs. 681 during the preceding year. There is also a large stock of specimens on hand. With the rising demand for Indian types it

is hoped that the specimen supply will continue self-supporting, particularly if the proposals for the establishment of a Marine Biological Station at Kurusadai materializes.

87. *Marine Biological Station at Kurusadai.*—In the scheme of drastic retrenchment which was effected during the year under report inquiries were set on foot for the sale of the Kurusadai Island which was originally acquired for the location of a marine biological station for experiments on the production of artificial pearls since abandoned by the department. There were good offers for its purchase which, if accepted, would have repaid Government almost the whole of the expenditure incurred on the scheme. Meanwhile, however, the 1924 Indian Science Congress which I attended at Bangalore on hearing of the existence and possibilities of the Kurusadai station passed a resolution to the effect that they believed the Kurusadai Island to be the most suitable and convenient place for the establishment of a biological station to meet the needs of the Universities of Madras, Mysore, Travancore, Bengal and probably Benares and some other universities in Northern India, where students and approved workers could obtain a practical knowledge of marine organisms and do biological research, as is done in the marine biological stations attached to universities in Japan, England and elsewhere; and that they hoped that the Madras Government would postpone the proposed sale of the Island to permit of definite proposals being framed by them. In my letter to Government No. 1943-B/23-11, dated 19th February 1924, I have explained in detail the benefits which the Fisheries Department would derive by accepting the offer of the Science Congress and the universities. A committee of biologists constituted by the Madras University to go into the matter in detail with myself paid a visit to the Island in May last, and the members were satisfied as to the possibilities and wealth of material afforded by that Island for biological research. The large botanical and zoological collection made during this visit have been worked out by Dr. Gravely, Professor Parthasarathi Ayyangar, Professor Ramunni Menon and other members of the committee and myself. A hand-book based on the collections for research students who would visit the Island is now in preparation under the editorship of Dr. Gravely, but for whose able championship of the cause as President of the Zoological Section of the

Congress the above developments would have been impossible. The proposals of the Madras University for the utilization of the Island as a biological station have since been received and are under consideration.

#### OYSTER FARM.

88. In pursuance of the retrenchment proposals mentioned above to amalgamate oyster work with Biological supply, the headquarters of the oyster-supply section were transferred from Pulicat to Ennur from January last and the post of the Overseer abolished. The 1923 season lasted only till 1st August 1923 but the 1924 season commenced early on 9th February 1924 and lasted till the 27th of September. The demand has risen considerably in the year under review. 203,592 oysters, the highest on record, were supplied against 184,350 during the year previous. The farm worked at a net profit of Rs. 332 as shown below against a loss of Rs. 491 during the preceding year:—

|                                                                                                                                                             | July 1923 to<br>January 1924<br>(7 months). | February to<br>June 1924<br>(5 months). | Total.     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------|------------|
|                                                                                                                                                             | RS. A. P.                                   | RS. A. P.                               | RS. A. P.  |
| Receipts ... ..                                                                                                                                             | 543 6 5                                     | 2,120 14 0<br>19 4 0                    | 2,663 8 6  |
| Expenditure inclusive of 20 per cent of<br>the pay of the Zoological Assistant<br>(Aquarium) and the Senior Operator,<br>respectively, for the two periods. | 1,173 2 8                                   | 1,178 4 2                               | 2,351 6 10 |
| Profit or loss ...                                                                                                                                          | -629 12 8                                   | +961 13 10                              | +332 1 8   |

From next year forwards the 20 per cent pay of the Zoological Assistant and travelling allowance as well as the pay of the Overseer will be eliminated totally, rendering the financial position of this section very secure.

89. There was a demand for live oysters from Calcutta during the year and a trial parcel of 100 oysters sent has shown that the oysters from Ennur can reach that place without heavy mortality. During my recent tour to the Northern Circars I have been able with the aid of the Sub-Assistant at Waltair, to locate oyster beds on the Ganjam and Vizagapatam coasts. The possibilities of working these beds are under investigation. Should they prove

satisfactory I propose to depute the Senior Operator for a fortnight or so every year to organize a regular supply to the Calcutta market from there.

90. *Research.*—The methods of purifying Ennur oysters adopted since 1921 have been further improved during the year. The method of suspending oysters in coir bags in clear tidal waters was discarded in favour of floating the oysters in specially designed rafts, as this gave the oysters every facility to clean themselves and approximated more to the natural conditions under which they live.

#### SOCIO-ECONOMIC SECTION.

##### EDUCATION.

91. *Fisheries Training Institute—Pupil teachers.*—The total number of pupil teachers undergoing training in the year under report was 33. Of these 24 were fishermen, 5 non-fishermen Hindus, 2 Christians and 2 Muhammadans. Thirteen belonged to the Higher Elementary and 20 to the Lower Elementary grade. Four Kanarese students were undergoing training in the Government Training School at Mangalore with stipends from the Fisheries Department.

*Staff.*—The school staff was strengthened during the year by the appointment of a graduate teacher (a fisherman by caste) as the senior assistant. One of the junior assistants who was untrained has been deputed for training in the Secondary Training School, Tellicherry.

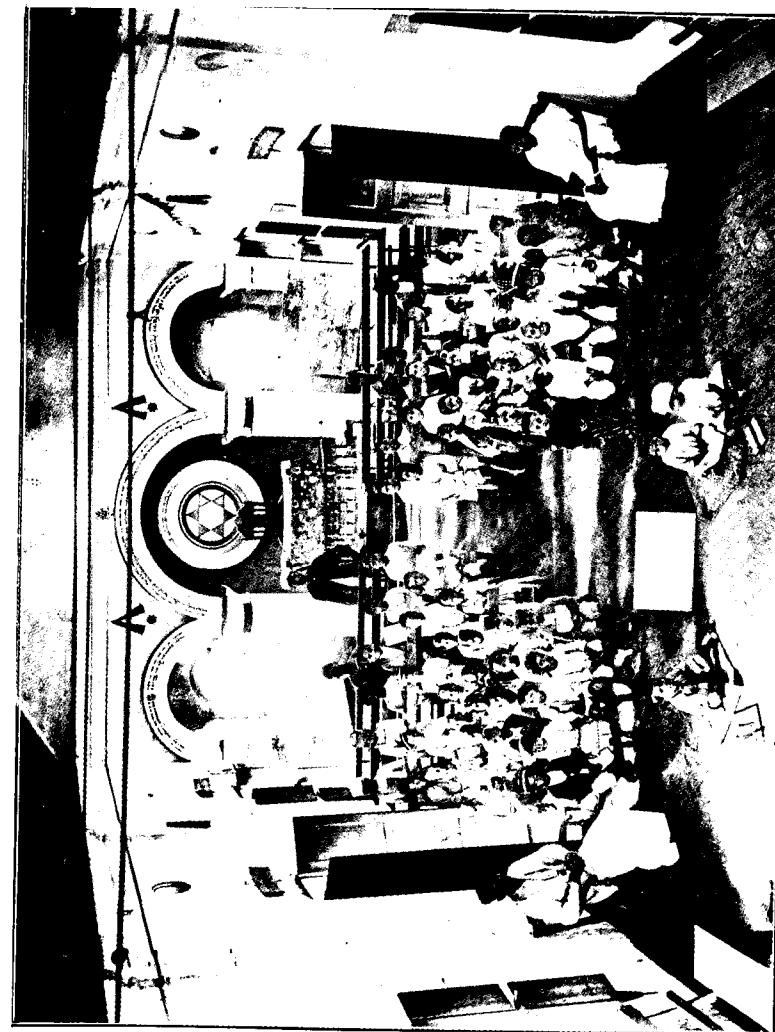
*Work.*—The teaching work of the school was carried on regularly on the usual lines. It was inspected by the District Educational Officer on 10th August 1923, and was reported on favourably. The pupil teachers spent altogether 20 days in the year on excursions to Tanur, Chaliyam and other fishing centres on the West Coast. Only one boat was available during the year for practical fishery work as the second boat was lent to Tanur. The sale-proceeds of fish caught by this boat amounted to Rs. 89-3-0. The carpentry work was confined to the making of articles used by fishermen. About Rs. 40 worth of such articles were made by the pupil teachers, of which Rs. 13-14-6 worth have been sold. The scout training was interrupted during the year by the transfer of the junior assistant who was the scout master to Kaipamangalam. The pupil

teachers for the first time took part during the year in the District Tutor School sports and succeeded in securing three first prizes. The school Co-operative Society was working actively and made a net profit of Rs. 62-10-4. The Literary Society was also active. The school hostel which was formerly located in a rented building was shifted on 1st August 1923 to the spacious bungalow in which the research section has its laboratory. Nearly three-fourths of the pupil teachers are inmates of the hostel.

92. *Village schools.*—The number of schools in existence at the close of 1922-23 was 26. Out of six schools sanctioned for the financial year 1924-25, only the one at Mandalankannu was opened before 30th June 1924. There were thus 27 schools at the close of the year under report. The number of pupils attending the schools at the end of 1922-23 was 1,761, 471 of whom were girls. At the end of the year under report there were 2,001 pupils of whom 504 were girls. The number of teachers rose from 63 to 69, those trained at the Fisheries Training Institute being 29 on 30th June 1924 as against 9 on the corresponding date in the previous year. The progress in the matter of education evinced by the fishermen community is encouraging.

#### TEMPERANCE AND SOCIO-ECONOMIC WORK.

93. Officers of the Department take a keen interest in addressing fishermen when they visit fishing villages on the evils of drink. In consequence, there is appreciable improvement among the younger men of the fishing community. In certain remote villages in Ponnāni Taluk, for example, Kottakadapuram, Talikulam and Kundazhiyur, there has been substantial improvement and most of the adult members are, it is reported, free from the habit of drinking. They also do not seem to have the same craving for tea as the fishermen of other maritime villages. It is hoped that their example will be followed in other parts. It is also under contemplation among the young men of Ponnāni Taluk to start young men's associations and, if this movement succeeds it will be a great achievement as, till a few years ago, South Ponnāni was one of the most backward in the matter of social and moral progress. There is already a students' debating society at Kottakadapuram, which includes young men who were lately students of the Fishery school at that place. The interest which



Interior of Sree Gnanodaya Hall, Mangalore.

the adult members take at its weekly meetings is encouraging and some of them hope to convert the debating society gradually into a young men's association.

94. Only one wing of the temperance hall and school building at Malpe has been completed, for which a grant-in-aid amounting to Rs. 1,337 has already been paid. It is in this wing that the Fishery school is located. The owner of the place does not seem to be taking much interest in constructing the other wings. He is apparently not getting the support that he expected from the other members of his community. To inculcate the habit of thrift and to improve their financial condition, young men of the fishermen community are being encouraged to deposit small sums in the post office savings bank during the fishing season, to be withdrawn in rainy weather, when they have a tendency to borrow money at exorbitant rates of interest. In this way they can in course of time be freed from the clutches of the local money-lender. Success in this direction can only be achieved gradually.

95. The social work undertaken by the Department has created an awakening among fishermen. The habits of thrift, temperance and cleanliness are gaining ground with the progress of education. It is therefore in the matter of opening more schools that the Fisheries Department first interests itself. In the district of South Kanara the Mongier fishermen are understood to have started an organization to collect funds with a view to spreading higher education among their community and ameliorating their condition.

96. Besides the nomination of representatives from the fishing community to the maritime taluk boards, municipal councils and district boards; for the first time this year a member of the community was nominated to represent them in the Madras Legislative Council in the person of M.R.Ry. Rao Sahib P. V. Gopalan Avargal, M.L.C.

#### CO-OPERATION.

97. During the year under report there were 54 credit societies two joint purchase and sale societies, of fish curers, and one wholesale society at Mangalore for fish oil and guano manufacturers against 63 societies at the close of last year. Of the two joint purchase and sale societies one started work only in May.

last and hence very little work was done during the year. The Malady fish curers' joint purchase and sale society which has been registered has yet to start work. The particulars of the transactions of the societies are given below :—

*Statement of figures relating to Fishermen Co-operative Societies.*

|                                            | 1922-23. | 1923-24. |
|--------------------------------------------|----------|----------|
| Number of members—                         |          |          |
| Males                                      | 2,968    | 2,697    |
| Females                                    | 359      | 335      |
| Total number of members                    | 3,327    | 3,032    |
| Number of shares                           | 4,723    | 4,093    |
| Paid-up share capital                      | 85,916   | 81,670   |
| Total of loans disbursed                   | 314,101  | 311,392  |
| Total of loans for payment of prior debts  | 60,296   | 75,499   |
| Total of loans for industrial use          | 120,033  | 91,662   |
| Total of loans received from Central Banks | 6,533    | 10,802   |

The societies were not working satisfactorily owing to the failure of the fishing season.

98. 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, 1923-24.*

| Post.                                        | Incumbent.                                 | Period.                             |
|----------------------------------------------|--------------------------------------------|-------------------------------------|
| Director                                     | James Hornell, Esq.                        | 1st July 1923. to 6th August 1923.  |
|                                              | Dr. B. Sundara Raj                         | 7th August 1923 to 30th June 1924.  |
| Assistant Director (Coast)                   | M.R.Ry. Rao Bahadur V. Govindan Avargal.   | 1st July 1923 to 9th May 1924.      |
|                                              | M.R.Ry. U. Karunakara Menon Avargal.       | 10th May to 30th June 1924.         |
| Assistant Director (Inland).                 | M.R.Ry. C. G. Chakrapani Ayyangar Avargal. | 1st July 1923 to 30th June 1924.    |
| Superintendent of Pearl and Shank Fisheries. | M.R.Ry. Rao Sahib J. A. Fernandez Avargal. | Do.                                 |
| Master Fisherman                             | Captain T. G. Cribb                        | 22nd August 1923 to 30th June 1924. |

*Statement II.—Summary of Expenditure and Revenue of the Fisheries Department for 1923-24.*

| Particulars.                                                                                                                   | Expenditure. | Revenue.      | Difference.   |
|--------------------------------------------------------------------------------------------------------------------------------|--------------|---------------|---------------|
|                                                                                                                                | RS. A. P.    | RS. A. P.     | RS. A. P.     |
| I. Supervision and research.                                                                                                   | 34,375 3 11  | 128 15 8      | — 34,246 4 3  |
| II. Education and allied subjects.                                                                                             | 40,075 9 8   | 572 2 0       | — 39,503 7 8  |
| III. Marine fisheries                                                                                                          | 88,745 13 7  | 1,19,308 11 4 | + 30,562 13 9 |
| IV. Inland fisheries                                                                                                           | 97,028 10 11 | 1,13,382 8 5  | + 16,353 13 6 |
| V. (a) Cannery (1st July 1923 to 31st March 1924).                                                                             | 28,065 5 6   | 26,497 5 11   | — 1,567 15 7  |
| (b) Tanur                                                                                                                      | 16,098 9 2   | 14,823 1 9    | — 1,275 7 5   |
| VI. Fish-curing yards (from 1st April to 30th June 1924).                                                                      | 32,279 13 7  | 19,832 7 2    | — 12,447 6 5  |
| Total                                                                                                                          | 3,36,669 2 4 | 2,94,545 4 3  | — 42,123 14 1 |
| Less total capital expenditure incurred during the year, less depreciation and interest charged in cannery and Tanur accounts. | 13,648 2 0   | .....         | 13,648 2 0    |
| Total                                                                                                                          | 3,23,021 0 4 | 2,94,545 4 3  | — 28,475 12 1 |

## Statement III.—Details of Expenditure.

| Particulars.                                              | Salaries.                    | Establishment.              | Allowances.                | Supplies and services. | Contingencies.           | Total.                   |
|-----------------------------------------------------------|------------------------------|-----------------------------|----------------------------|------------------------|--------------------------|--------------------------|
| I. Supervision and research ...                           | RS. A. P.<br>(a) 10,414 13 0 | RS. A. P.<br>(b) 16,013 8 6 | RS. A. P.<br>(c) 3,670 3 0 | RS. A. P.<br>483 15 6  | RS. A. P.<br>3,792 11 11 | RS. A. P.<br>34,375 3 11 |
| II. Education and allied subjects (non-commercial).       | (d) 3,565 4 3                | 23,299 11 9                 | 3,465 3 0                  | 8,897 13 5             | 847 9 3                  | 40,075 9 8               |
| III. Marine fisheries ...                                 | (e) 9,514 4 0                | (f) 17,434 6 2              | (g) 1,904 3 0              | 57,848 9 8             | 2,044 6 9                | 88,745 13 7              |
| IV. Inland fisheries ...                                  | 2,526 0 0                    | 10,974 6 0                  | 6,007 2 0                  | 76,331 12 4            | 1,189 6 7                | 97,028 10 11             |
| V. (a) Cannery ...                                        | 355 0 0                      | (i) 4,518 13 5              | ...                        | 21,171 3 1             | 2,020 5 0                | 28,065 5 6               |
| (b) Tanur Experimental Station ...                        | 937 2 0                      | (k) 2,260 12 0              | 193 15 0                   | 9,842 0 0              | 2,864 12 2               | 16,098 9 2               |
| VI. Fish-curing yards (from 1st April to 30th June 1924). | (l) 3,002 5 2                | 14,296 5 0                  | 1,378 7 0                  | .....                  | 13,602 12 5              | 32,279 13 7              |
| Total ...                                                 | 30,314 12 5                  | 88,797 14 10                | 16,619 1 0                 | 1,74,575 6 0           | 26,362 0 1               | 3,36,669 2 4             |

(a) Represents 95 per cent of the pay of the Director and the leave allowance of Dr. B. Sundara Raj from 1st July to 6th August 1923.  
 (b) Includes pay of the Zoological Assistant and his peon left after debiting to Oyster Farm and Marine Aquarium and pay of Zoological Supply Section clerk for 11 months.

(c) Excludes travelling allowance of Oyster clerk debited Oyster Farm.

(d) Represents 47½ per cent of the pay of the Assistant Director (Coast) (40 per cent is debited to fish-curing yards and 12½ per cent to Tanur).

(e) Represents pay of the Superintendent, Pearl and Chank Fisheries, and Master Fisherman.

(f) Includes pay of the "Sea Scout" staff, pay of Zoological Assistant and peon less amount debited to "Supervision and research" and pay of Zoological Supply Section staff less pay of clerk for 11 months debited to "Supervision and research" and pay of Mr. Ramaswami Nayudu for 26 days in March at the Aquarium.

(g) Includes travelling allowance of Master Fisherman and his staff, travelling allowance of Oyster clerk, travelling allowance of Zoological Assistant and his peon and presidency allowance of Mr. Ramaswami Nayudu at the Aquarium for 26 days in March 1924.

(h) Represents 5 per cent of the Director's pay up to 31st March 1924.

(i) Represents the full pay of the staff.

(j) Represents 12½ per cent of the Assistant Director's (Coast) pay.

(k) Represents the full pay of the staff.

(l) Represents 40 per cent of the Assistant Director's (Coast) pay.

## Statement IV.—Details of Supplies and Services.

|                                                      | RS. A. P.   | RS. A. P.   | RS. A. P. | RS. A. P. | RS. A. P. | RS. A. P. |
|------------------------------------------------------|-------------|-------------|-----------|-----------|-----------|-----------|
| I. Supervision and research—                         |             |             |           |           |           |           |
| Repairs to the Ennur bungalow ...                    | 483 15 6    | 483 15 6    |           |           |           |           |
| II. Education and allied subjects—                   |             |             |           |           |           |           |
| (1) Training Institute, Calicut ...                  | 6,366 3 11  |             |           |           |           |           |
| (2) Day and night schools ...                        | 2,530 9 6   | 8,897 13 5  |           |           |           |           |
| III. Marine fisheries—                               |             |             |           |           |           |           |
| A. Chank fisheries—                                  |             |             |           |           |           |           |
| (1) Ramnad fisheries ...                             | 15,187 5 2  |             |           |           |           |           |
| (2) Tirnevelly fisheries ...                         | 18,849 5 7  |             |           |           |           |           |
| (3) Leased fisheries ...                             | 8 0 0       |             |           |           |           |           |
| B. Pearl fisheries ...                               |             |             |           |           |           |           |
| (1) Examination of pearl banks, ...                  | 446 8 0     |             |           |           |           |           |
| (2) Pamban pearl farm ...                            | 164 10 6    |             |           |           |           |           |
| C. Vessels—                                          |             |             |           |           |           |           |
| (1) Lady Nicholson ...                               | 6,321 7 9   |             |           |           |           |           |
| (2) Leverett ...                                     | 1,981 9 6   |             |           |           |           |           |
| (3) Sutherland ...                                   | 1,020 2 7   |             |           |           |           |           |
| (4) Pearl ...                                        | 850 3 0     |             |           |           |           |           |
| (5) Sea Scout ...                                    | 3,767 7 9   |             |           |           |           |           |
| D. Other works—                                      |             |             |           |           |           |           |
| (1) Marine Aquarium ...                              | 4,912 0 10  |             |           |           |           |           |
| (2) Zoological specimen supply, ...                  | 1,983 11 11 |             |           |           |           |           |
| (3) Pulicat oyster farm ...                          | 1,745 15 10 |             |           |           |           |           |
| (4) Beche-de-mer fisheries ...                       | 610 1 3     | 57,848 9    |           |           |           |           |
| IV. Inland fisheries—                                |             |             |           |           |           |           |
| A. Tank stocking—                                    |             |             |           |           |           |           |
| (1) Compensation to District Boards, ...             | 62,197 11 0 |             |           |           |           |           |
| (2) Stocking of tanks ...                            | 1,777 5 3   |             |           |           |           |           |
| (3) Chingleput and Nellore tank stocking scheme, ... | 1,588 0 4   |             |           |           |           |           |
| B. Other works—                                      |             |             |           |           |           |           |
| (1) Sunkesula fish farm ...                          | 4,100 5 2   |             |           |           |           |           |
| (2) Ippur fish farm ...                              | 1,631 13 8  |             |           |           |           |           |
| (3) Powder factory farm ...                          | 580 11 0    |             |           |           |           |           |
| (4) Chingleput fort moat farm, ...                   | 353 12 1    |             |           |           |           |           |
| (5) Veilore fort moat farm ...                       | 988 15 3    |             |           |           |           |           |
| (6) Mopad fish farm ...                              | 2,097 15 8  |             |           |           |           |           |
| (7) Larvicidal operations ...                        | 28 7 0      |             |           |           |           |           |
| (8) Horse boat maintenance ...                       | 713 10 0    |             |           |           |           |           |
| (9) Nallamalais scheme ...                           | 273 1 11    | 76,331 12 4 |           |           |           |           |

## Statement V.—Details of Revenue.

| I. Supervision and Research.                 | II. Education and allied subjects (non-commercial). | III. Marine fisheries.                                                             | IV. Inland fisheries.                                                                                          | V. Factories.                                                                                               |
|----------------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| RS. A. P.<br>47 12 8                         | RS. A. P.<br>569 14 0                               | RS. A. P.<br>98,655 5 4                                                            | RS. A. P.<br>98,458 0 8                                                                                        | RS. A. P.<br>15,004 12 1                                                                                    |
| (1) Receipts from Research Section, Calicut. | Fisheries Training Institute, Calicut.              | (1) Revenue from all fisheries including Beche-de-mer fishery as per statement VI. | (1) Rentals from Cauvery, Coleroon, general tanks and canals.                                                  | A. Cannery—<br>(1) By net sales of canned fish as per trading account.                                      |
| (2) Miscellaneous receipts.                  | Day and night schools.                              | (2) Revenue from Pearl fishery section as per statement VII.                       | (2) Rentals from the tanks in the Chingleput district.                                                         | (2) By miscellaneous receipts as per production account.                                                    |
| (3) Rent of Ennur bungalow.                  |                                                     | (3) Revenue from Marine Aquarium.                                                  | (3) Rentals from the tanks in the Nellore district.                                                            | (3) By miscellaneous receipts as per profit and loss account.                                               |
|                                              |                                                     | (4) Revenue from Zoological Supply Section.                                        | (4) Rentals realized after 30th June 1923 from Putha Cudappah tank and few other tanks in Chingleput district. | (4) Value of goods on hand—<br>On 1st July 1924 ... 54,391 11 1<br>1923 ... 44,734 15 7                     |
|                                              |                                                     | (5) Revenue from Pulicat oyster farm.                                              | (5) Receipts from fish farms by sale of fish, grass, etc.                                                      | (5) By value of raw materials, etc.—<br>On 1st July 1924 ... 12,195 2 1<br>1923 ... 10,568 15 3             |
|                                              |                                                     | (6) Revenue from lease of right of fishery in Salt factory channels.               | (6) Miscellaneous receipts including sale proceeds of motor boat.                                              | B. Tanur—<br>(1) Actual receipts (amounts remitted into treasury and amounts credited by book adjustments). |
|                                              |                                                     |                                                                                    |                                                                                                                | (2) Amount outstanding—<br>On 1st July 1924 ... 1,828 2 7<br>1923 ... 6,566 12 9                            |
|                                              |                                                     |                                                                                    |                                                                                                                | (3) Value of goods on hand—<br>On 1st July 1924 ... 5,572 4 2<br>1923 ... 3,462 13 9                        |
| 128 15 8                                     | 572 2 0                                             | 1,19,308 11 4                                                                      | 1,13,382 8 5                                                                                                   | 17,452 5 6<br>- 4,738 10 2<br>2,109 6 5<br>14,823 1 9                                                       |

## Statement VI.—Profit and Loss Account of the Chank and Beche-de-mer Fisheries for the season 1923-24.

| Expenditure.                                                                                                             | Amount.      | Revenue.                                   | Amount.      |
|--------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------|--------------|
|                                                                                                                          | RS. A. P.    |                                            | RS. A. P.    |
| Chank fisheries—                                                                                                         |              | Value of chanks fished and other receipts— |              |
| Tinnevely ...                                                                                                            | 24,495 13 11 | Tinnevely ...                              | 65,655 14 11 |
| Rāmnād ...                                                                                                               | 16,283 2 5   | Rāmnād ...                                 | 27,646 11 5  |
| Sivaganga ...                                                                                                            | 320 14 0     | Sivaganga ...                              | 246 9 11     |
| Beche-de mer fishery ...                                                                                                 | 610 1 3      | Beche-de-mer ...                           | 896 1 1      |
| Leased ...                                                                                                               | 8 0 0        | Chank rentals realized—                    |              |
| Eleventh year's proportion of the total consideration paid in 1913-14 for a 15 years' lease of the Rāmnād fishery.       | 4,000 0 0    | Tanjore district ...                       | 2,750 0 0    |
| Supervision charges, viz.—<br>66½ per cent of pay and travelling allowance of Superintendent, Pearl and Chank Fisheries. | 2,404 10 8   | South Arcot district ...                   | 700 0 0      |
| Balance of profit ...                                                                                                    | 50,532 11 1  | Chingleput and Nellore districts.          | 760 0 0      |
| Total ...                                                                                                                | 98,655 5 4   | Total ...                                  | 98,655 5 4   |

## Statement VII.—Profit and Loss Account of the Pearl Fishery Section for the season 1923-24.

| Expenditure.                                                                                                            | Amount.      | Revenue                                                                    | Amount.      |
|-------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------|--------------|
|                                                                                                                         | RS. A. P.    |                                                                            | RS. A. P.    |
| Pearl fisheries—                                                                                                        |              | Receipts from Krusadai Island.                                             | 157 0 0      |
| Examination of pearl banks.                                                                                             | 446 8 0      | Receipts from sale of oil and stores of vessels engaged by Research Party. | 83 12 3      |
| Pamban pearl farm                                                                                                       | 164 10 6     | Sale-proceeds of condemned stores of fisheries vessels.                    | 161 12 0     |
| Contingencies ...                                                                                                       | 1,124 4 3    | Rent of fisheries bungalow at Tuticorin.                                   | 51 12 6      |
| Running expenses of "Lady Nicholson".                                                                                   | 6,321 7 9    | Miscellaneous receipts ...                                                 | 209 10 9     |
| Contingencies ...                                                                                                       | 100 0 0      | Loss ...                                                                   | 15,164 12 4  |
| Pay and travelling allowance of crew of "Lady Nicholson."                                                               | 3,946 0 0    |                                                                            |              |
| Pay and travelling allowance of Pearl Fishery establishment.                                                            | 2,523 8 0    |                                                                            |              |
| Supervision charges viz.—<br>33½ per cent of pay and travelling allowance of Superintendent, Pearl and Chank Fisheries. | 1,202 5 4    |                                                                            |              |
| Total ...                                                                                                               | 15,828 11 10 | Total ...                                                                  | 15,828 11 10 |

Statement VIII.—Government Fisheries Cannery, Chaliyam—Production Account for nine months ending  
31st March 1924.

|                          | Amount.<br>RS. A. P. | Amount.<br>RS. A. P. |
|--------------------------|----------------------|----------------------|
| To opening stock—        |                      |                      |
| Raw materials            | 8,664 2 0            | 195 6 0              |
| Empty cans               | 1,728 13 3           |                      |
| Guano                    | 125 0 0              | 15,261 6 4           |
| Fish oil                 | 25 0 0               |                      |
| Prawn shells             | 6 0 0                |                      |
| Pit manure               | 20 0 0               |                      |
|                          | 10,568 15 3          |                      |
| To Purchases—            |                      |                      |
| Fish for curing          | 1,505 0 6            |                      |
| Raw materials            | 11,875 4 11          |                      |
|                          | 13,380 5 5           |                      |
| To Manufacturing wages   |                      |                      |
| To Salaries—             |                      |                      |
| Mechanic                 | 723 0 0              |                      |
| Canning Overseer         | 315 0 0              |                      |
| Store Clerk—half pay     | 163 2 6              |                      |
| Sub-Assistant—one-third  | 380 14 0             |                      |
|                          | 1,582 6 6            |                      |
| To Repairs               |                      |                      |
|                          | 480 8 7              |                      |
| To Depreciation on tools |                      |                      |
|                          | 110 0 0              |                      |
|                          | 27,651 14 5          |                      |
|                          |                      | 12,195 2 1           |
|                          |                      | 27,651 14 5          |

Statement IX.—Government Fisheries Cannery, Chaliyam—Trading Account for nine months ending  
31st March 1924.

|                                                     | Amount.<br>RS. A. P. | Amount.<br>RS. A. P. |
|-----------------------------------------------------|----------------------|----------------------|
| To opening stock—                                   |                      |                      |
| Canned fish at Chaliyam                             | 33,919 7 0           | 15,004 12 1          |
| Canned fish with McDowell & Co., Ltd.               | 10,398 4 1           |                      |
| Packing materials                                   | 417 4 6              | 5,273 15 1           |
|                                                     |                      | 48,753 12 0          |
| To canned fish as per production account.           |                      | 364 0 0              |
|                                                     |                      | 54,391 11 1          |
| To selling expenses—                                |                      |                      |
| Packing materials                                   | 9 7 9                |                      |
| Railway freight, coolie, etc.                       | 403 9 5              |                      |
| Postage and telegrams                               | 2,020 5 0            |                      |
| Advertising                                         | 1,193 14 6           |                      |
| Salaries                                            | 1,007 3 0            |                      |
| Commission and discount                             | 553 10 3             |                      |
|                                                     | 5,188 1 11           |                      |
| To gross profit carried to profit and loss account. |                      | 4,211 15 4           |
|                                                     |                      | 69,396 7 2           |
|                                                     |                      | 69,396 7 2           |

Statement X.—Government Fisheries Cannery, Chaliyam—Profit and Loss Account for nine months ending 31st March 1924.

|                                              | RS. | A. P. | RS.   | A. P. | RS.                              | A. P.     |
|----------------------------------------------|-----|-------|-------|-------|----------------------------------|-----------|
| To Establishment .. .. .                     | ... | ...   | 1,929 | 9 11  | ...                              | ...       |
| " Printing and stationery .. .. .            | ... | ...   | 154   | 12 5  | By Gross profit .. .. .          | ...       |
| " Law charges .. .. .                        | ... | ...   | 18    | 5 5   | " Miscellaneous receipts .. .. . | ...       |
| " Miscellaneous .. .. .                      | ... | ...   | 173   | 5 8   | " Net loss .. .. .               | ...       |
| " Share of direction expenses .. .. .        | ... | ...   | 355   | 0 0   |                                  |           |
| " Interest on capital .. .. .                | ... | ...   | 1,340 | 4 0   |                                  |           |
| " Audit fee .. .. .                          | ... | ...   | 250   | 0 0   |                                  |           |
| " Bad debts written off .. .. .              | ... | ...   | 157   | 7 0   |                                  |           |
| " Reserve for bad and doubtful debts .. .. . | ... | ...   | 269   | 15 0  |                                  |           |
| " Depreciation—                              |     |       |       |       |                                  |           |
| On buildings .. .. .                         | 418 | 0 0   |       |       |                                  |           |
| On plant and machinery .. .. .               | 675 | 9 0   |       |       |                                  |           |
| On furniture .. .. .                         | 52  | 0 0   |       |       |                                  |           |
|                                              |     |       | 1,145 | 9 0   |                                  |           |
| Total .. .. .                                | ... | ...   | 5,794 | 4 5   | Total .. .. .                    | 5,794 4 5 |

Total ... 5,794 4 5

Statement XI.—Government Experimental Station, Tanur—Trading Account for the year ending 30th June 1924.

|                                                                                      | RS. | A. P. | RS.    | A. P. | RS.                                                      | A. P.  | RS.  | A. P. |
|--------------------------------------------------------------------------------------|-----|-------|--------|-------|----------------------------------------------------------|--------|------|-------|
| To stock on hand on 1st July 1923—                                                   |     |       |        |       |                                                          |        |      |       |
| Cured fish .. .. .                                                                   | ... | ...   | 334    | 5 8   | By sale proceeds of goods remitted into treasury .. .. . | 11,868 | 6 3  |       |
| Fish meal .. .. .                                                                    | ... | ...   | 370    | 0 0   | By adjustments through Accountant-General .. .. .        | 4,768  | 4 6  |       |
| Prawn shells .. .. .                                                                 | ... | ...   | 5      | 9 8   |                                                          | 16,636 | 10 9 |       |
| Fish guano .. .. .                                                                   | ... | ...   | 956    | 12 11 | Less outstandings as on 30th June 1923 .. .. .           | 6,566  | 12 9 |       |
| Expendible stores .. .. .                                                            | ... | ...   | 1,796  | 1 6   |                                                          | 10,069 | 14 0 |       |
| To establishment wages—wages of coolies—overtime and coolies on muster rolls .. .. . | ... | ...   | ...    | ...   | By stock on hand on 30th June 1924—                      |        |      |       |
| Fish for curing .. .. .                                                              | ... | ...   | 2,455  | 15 7  | Cured fish .. .. .                                       | 366    | 8 0  |       |
| Fish for oil and guano .. .. .                                                       | ... | ...   | 808    | 1 8   | Fish meal .. .. .                                        | 1,157  | 8 0  |       |
| Cost of oil .. .. .                                                                  | ... | ...   | 846    | 9 0   | Prawn shells .. .. .                                     | 8      | 4 0  |       |
| Fuel .. .. .                                                                         | ... | ...   | 266    | 1 10  | Fish oil and guano .. .. .                               | 865    | 14 0 |       |
| Packing materials .. .. .                                                            | ... | ...   | 1,030  | 3 8   | Coconuts .. .. .                                         | 28     | 8 8  |       |
| Railway freight on cured goods .. .. .                                               | ... | ...   | 672    | 9 4   | Packing materials and expendible stores .. .. .          | 3,145  | 9 6  |       |
| Sundry stores .. .. .                                                                | ... | ...   | 527    | 3 5   |                                                          |        |      |       |
|                                                                                      |     |       | ...    | ...   | By book debts (outstanding) on 30th June 1924 .. .. .    | 5,572  | 4 2  |       |
| Total .. .. .                                                                        | ... | ...   | 13,304 | 13 9  |                                                          | 1,828  | 2 7  |       |

To gross profit transferred to profit and loss account.

Total ... 17,470 4 9

|                                                                                                                                                                                                                           | Profit. |     |     | Amount. |       |    | Loss. | Amount.                                                   |       |     |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|-----|---------|-------|----|-------|-----------------------------------------------------------|-------|-----|-----|
|                                                                                                                                                                                                                           | Rs.     | A.  | P.  | Rs.     | A.    | P. |       | Rs.                                                       | A.    | P.  |     |
| To Rent of Cannanore yard ...                                                                                                                                                                                             | ...     | ... | ... | ...     | 60    | 0  | 0     | By Gross profit transferred from profit and loss account. | 4,165 | 7   | 0   |
| " Postage stamps ...                                                                                                                                                                                                      | ...     | ... | ... | ...     | 342   | 7  | 9     | " Rent of Cannanore yard                                  | ...   | ... | ... |
| " Salaries of staff ...                                                                                                                                                                                                   | ...     | ... | ... | ...     | 2,260 | 12 | 0     | " Other rents collected                                   | ...   | ... | ... |
| " Travelling allowance ...                                                                                                                                                                                                | ...     | ... | ... | ...     | 193   | 15 | 0     | " Sundry receipts                                         | ...   | ... | ... |
| " Share of direction charges 12½ per cent of Assistant Director's salary.                                                                                                                                                 | ...     | ... | ... | ...     | 937   | 15 | 0     | " Sale proceeds of coconuts                               | ...   | ... | ... |
| " Interest on capital ...                                                                                                                                                                                                 | ...     | ... | ... | ...     | 385   | 2  | 4     | " Rent (miscellaneous) to be collected                    | ...   | ... | ... |
| " Bad debts written off ...                                                                                                                                                                                               | ...     | ... | ... | ...     | 7     | 14 | 0     |                                                           |       |     |     |
| " Freight on miscellaneous goods and petty coolie                                                                                                                                                                         | ...     | ... | ... | ...     | 278   | 11 | 11    |                                                           |       |     |     |
| " Repairs to building and sheds ...                                                                                                                                                                                       | ...     | ... | ... | ...     | 231   | 10 | 6     |                                                           |       |     |     |
| " " plant and machinery                                                                                                                                                                                                   | ...     | ... | ... | ...     | 99    | 14 | 0     |                                                           |       |     |     |
| " Maintenance of coconut plantation                                                                                                                                                                                       | ...     | ... | ... | ...     | 150   | 12 | 0     |                                                           |       |     |     |
| " Exhibition charges ...                                                                                                                                                                                                  | ...     | ... | ... | ...     | 19    | 10 | 6     |                                                           |       |     |     |
| " Miscellaneous expenses ...                                                                                                                                                                                              | ...     | ... | ... | ...     | 47    | 10 | 8     |                                                           |       |     |     |
| " Depreciation on plant and machinery, buildings and sheds and furniture. (Includes Rs. 61-2-7 towards depreciation on buildings and sheds, Rs. 580-3-9 on plant and machinery and Rs. 49-8-2 on furniture and fittings.) | ...     | ... | ... | ...     | 1,240 | 14 | 6     |                                                           |       |     |     |
| Total ...                                                                                                                                                                                                                 | ...     | ... | ... | ...     | 6,256 | 9  | 2     | Total ...                                                 | 4,981 | 1   | 9   |
|                                                                                                                                                                                                                           |         |     |     |         |       |    |       | Net loss ...                                              | 1,275 | 7   | 5   |
|                                                                                                                                                                                                                           |         |     |     |         |       |    |       | Grand total ...                                           | 6,256 | 9   | 2   |

4. The introduction of the commercial system of accounts in the Fish Cannery at Chaliyam has enabled the Government to form a more accurate estimate of its financial possibilities. The nine months' working now under review resulted in a loss which the Government understand is even more pronounced in the first quarter of the current year. Pending a decision on the future of the Cannery, the Government have issued orders that the output should be curtailed in view of the present large accumulation of stocks. Attempts are being made to find new markets for the Cannery products outside India ; but unless the local demand shows signs of improvement, the Government doubt whether it will be advisable to continue the experiment, more especially as private enterprise is already engaged in the industry.

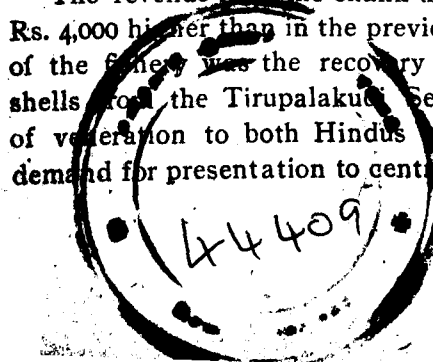
5. The Tanur Experimental station worked at a loss of Rs. 1,275 against a net profit of Rs. 3,480 in the year 1922-23. The loss in this case is attributable to the unfavourable character of the fishing season, a temporary condition which adversely affected all similar enterprises on the West Coast. The demand for cured fish, oil and guano exceeded the possibilities of supply, and in normal circumstances the Government see no reason why the station should not work at a profit after making provision for expenditure on experiments and technological research. The Government note with satisfaction the improvements effected in the processes of manufacture.

6. Owing to the failure of the sardine season in South Kanara and South Malabar, only 440 private oil and guano factories worked during the year against 647 in 1922-23; it is reported that on a rough calculation the guano manufactured amounted to 22,500 tons valued approximately at Rs. 13½ lakhs as against 32,000 tons valued at Rs. 24 lakhs in the previous year. 17,000 tons of fish manure and 7,250 tons of oil were also manufactured, the value of which is estimated at Rs. 6,80,000 and Rs. 14,50,000, respectively. These figures give some idea of the importance of the industry and fully justify further experimental work at the Tanur station.

7. In spite of the prevalence of plague in Tuticorin and the tempting wages offered by the Ceylon merchants which induced many divers to seek employment on the Ceylon Coast, the working of the Pearl and Chank Fishery Section continued to be satisfactory. The net profits of the year were Rs. 35,368 as compared with Rs. 38,286 in the previous year; but the latter figure includes a sum of Rs. 9,450 received for the hire of the launch *Lady Nicholson*, an abnormal item of receipt.

The condition of the pearl banks is reported by the Director to be satisfactory. In view of the prospects of a remunerative fishery in 1926, the Government consider that the Director should make arrangements in advance to secure an adequate complement of divers.

The revenue from the chank fishery taken separately was some Rs. 4,000 higher than in the previous year. An interesting feature of the fishery was the recovery of 5 "sinistral" or left-handed shells from the Tirupalakudi Section. These shells are objects of veneration to both Hindus and Buddhists and are in great demand for presentation to centres of pilgrimage.



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