

Report of the Department
of Industries, Madras

1935 - March.

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REPORT OF THE
DEPARTMENT OF INDUSTRIES
MADRAS

FOR THE
YEAR ENDING 31st MARCH 1935

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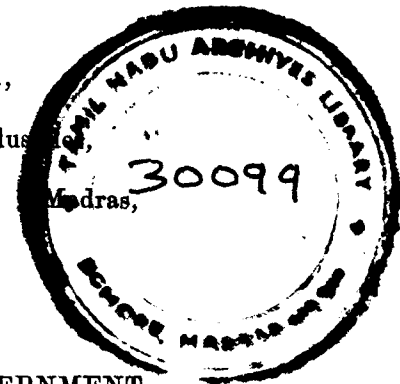
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OFFICE OF THE DIRECTOR OF INDUSTRIES,
MADRAS, dated the 29th July 1935.

From

L. B. GREEN, Esq., M.B.E.,

Acting Director of Industries,



To

THE SECRETARY TO GOVERNMENT,

DEVELOPMENT DEPARTMENT,

Fort St. George, Madras.

SIR,

I have the honour to submit the Administration Report of the
Department of Industries for the year ended 31st March 1935.

I have the honour to be,

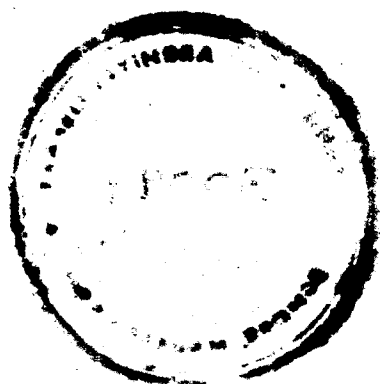
Sir,

Your most obedient servant,

L. B. GREEN,
Acting Director of Industries.

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ADMINISTRATION REPORT OF THE DEPARTMENT OF
INDUSTRIES, MADRAS, FOR THE YEAR ENDED
31st MARCH 1935.

Direction.—Mr. V. Ramakrishna, I.C.S., was in charge of the department throughout the year. I continued to hold the appointment of Deputy Director of Industries throughout the year under review, except for a period of two and a half months from 7th November 1934 when I was on special duty in the Public Works Department and Mr. W. Fyfe acted as Deputy Director in my stead.

2. *Tours.*—Mr. Ramakrishna was on tour within the Presidency for 71 days during the year. He attended the sessions of the Legislative Assembly at Delhi in April and at Simla in July-August. Mr. Ramakrishna also attended the meeting of the Imperial Sericulture Committee at Delhi in February.

3. *Exhibitions.*—The department, as usual, participated during the year in a number of agricultural and industrial exhibitions held in various parts of the Presidency, e.g., at Madura, Tinnevely, Srirangam, Nellore, Madras, Vellore and Calicut. At most of these exhibitions, a representative range of soaps manufactured at the Kerala Soap Institute, Calicut, was displayed and, wherever possible, the working of pumping and boring machinery, of improved textile appliances, and of silk-worm rearing and reeling appliances was demonstrated for the benefit of the agriculturists, handloom weavers and the general public. At one exhibition, a demonstration of the Adyanthaya coke oven was also conducted. A successful departmental display was staged in connexion with the annual Park Fair held at Madras in December, the exhibits including a hand-boring set, a crude oil pumping set for irrigation purposes, a high speed pumping set for well-sinking, a hand bore-hole pump manufactured at the Industrial Engineering Workshops, a model of an artesian borehole, a model of a juice boiling furnace and a Pinto chekku in actual operation. Demonstrations were also conducted in the rearing of mulberry and eri silk worms, in the re-reeling and twisting of silk yarn, in the weaving of mulberry silk and eri silk cloths on an improved type of handloom, in the knitting of socks and fabrics on the circular and flat bed machines, and of dyeing and aerograph printing. The working of small and cheap appliances for warping and weaving, evolved at the Government Textile Institute, was also demonstrated. Exhibitions and fairs held in other parts of India, as well as in

countries overseas, such as the British Industries Fair, Exhibition of Labels and Label Designs, London, Exhibition of Arts and Beauty, Johannesburg, Burma Arts, Crafts and Industrial Exhibition, All-India Industrial Exhibition, Delhi, and the Poona Industrial Exhibition, were, in accordance with the usual practice, brought to the notice of important firms, individuals, chambers of commerce and fine arts societies in the Presidency. Government sanctioned the payment of a contribution of Rs. 500 to the Regional Committee formed at Madras to collect and despatch exhibits to the Exhibition of Modern Indian Art held in London during the year, and arrangements were made for some fifteen pictures and four sculptures of artistic merit from this Presidency to be displayed at the exhibition.

4. *Committees.*—The Director of Industries continued to serve on the following committees:—

- Local Advisory Committee of the South Indian Railway.
- Local Advisory Committee of the Madras and Southern Mahratta Railway.
- Provincial Cotton Committee.
- Committee of the Victory Memorial School for the Blind, Poonamallee.
- Council of the Victoria Technical Institute.

Mr. Ramakrishna continued to serve as a member of the Senate of the Andhra University, and of the Court of the Indian Institute of Science, Bangalore. The Director of Industries was appointed a member of the Provincial Marketing Board constituted during the year.

5. *Conferences.*—A conference of Ministers in charge of Industries and Directors of Industries was held at Simla in July at which the following three important subjects were discussed:—

- (i) the establishment of a Central Industrial Intelligence and Research Bureau;
- (ii) the utilization by distribution among the provinces concerned in respect of approved schemes, of an annual grant of rupees one lakh to be devoted to sericultural research, and
- (iii) the utilization in a similar manner of an annual grant of about rupees five lakhs for the furtherance of approved schemes for the development of the handloom weaving industry. The conference was attended by myself, Mr. D. M. Amalsad, Assistant Director of Industries (Textiles), and Diwan Bahadur A. Appadurai Pillai, the latter of whom was nominated as a non-official representative. The proceedings of the conference have been published as a bulletin by the Government of India.

6. *Statutory Board of Industries.*—The composition of the Board of Industries was as noted below at the beginning of the year 1934-35:—

- | | |
|--|---|
| (i) The Director of Industries, Madras | } Ex officio. |
| (ii) The Secretary to Government, Finance Department | |
| (iii) D. M. Reid, Esq., M.C., elected by the Madras Chamber of Commerce. | |
| (iv) M.R.Ry. Chandulal M. Kothari, B.A., LL.B., elected by the Southern India Chamber of Commerce. | |
| (v) D. Q. Davidson, Esq., elected by the Madras Trades Association. | |
| (vi) M.R.Ry. Diwan Bahadur A. Appadurai Pillai Avargal, M.A., M.L.C., I.S.O. | } Elected by the Madras Legislative Council. |
| (vii) M.R.Ry. V.T. Arasu Avargal, M.L.C. | |
| (viii) Muhammad Ismail Sahib Bahadur | } Nominated by Government under section 3 (2) of the State Aid to Industries Act. |
| (ix) M.R.Ry. A. Ranganatha Mudaliyar Avargal, M.L.C. | |
| (x) M.R.Ry. Chelikani Appa Rao Garu | |
| (xi) M.R.Ry. A. M. M. Murugappa Chettiyar Avargal | |
| (xii) The Registrar of Co-operative Societies, Madras | |

M.R.Ry. A. M. M. Murugappa Chettiyar vacated his seat on the Board by efflux of time in February 1935, and in his place M.R.Ry. Rao Bahadur C. V. S. Narasimha Raju Garu was appointed shortly after the close of the year. Mr. D. Q. Davidson, representing the Madras Trades Association on the Board, vacated his seat in May 1934 by efflux of time, but was re-elected as a member by the Association for a further period of three years from 14th June 1934.

7. The loan of Rs. 500 granted to M.R.Ry. A. C. Krishnaswami Pillai, referred to in paragraph 7 of last year's report, was disbursed immediately after the close of the year under review. The application of Mr. F. L. Silva, referred to in the same paragraph, was withdrawn by the applicant as Government were not prepared to sanction a loan of more than Rs. 7,500 on the security offered. All the three applications recommended to Government by the Board during the previous year (vide paragraph 8 of last year's report) were rejected as the security offered by the applicants was considered inadequate. Of the two draft Bills to amend the State Aid to Industries Act, which were under the consideration of Government at the close of the previous year, the proposal to amend the Act so as to provide for the supply of machinery on the hire-purchase system was not accepted by Government. The Bill to amend the Act so as to provide for the grant of electric power on favourable terms to industries eligible for assistance under the Act was under the consideration of Government at the close of the year.

8. The affairs of the concerns, which have received aid under the Act, are briefly reviewed below:—

- (i) *The Kallakurichi Co-operative Agricultural and Industrial Society, Limited.*—According to the audit report, the society sustained a loss of Rs. 119-1-0 on its working during the year ended 30th June 1934. The society paid the instalment of the loan that fell due in 1934-35.
- (ii) *The Andal Mills, Gudiyattam.*—As stated in the report of the previous year, the sale of the properties of the insolvent, Mr. D. Rangaswami Nayudu, consisting of the machinery and its accessories and the building material of the factory which were mortgaged to Government realized Rs. 379 only. The borrower had, subsequent to the grant of the Government loan, and execution of the mortgage in favour of Government on the factory, purchased and installed a 60 B.H.P. gas engine. As Messrs. Crossley Brothers, Limited, disputed the prior claim of Government to the engine, a notice was issued to them on the advice of the Government Solicitor pointing out that, in virtue of the mortgage executed by the insolvent in favour of Government, the engine became an accession to the mortgaged property, and calling upon them to pay the balance due to Government under the mortgage or to surrender and deliver possession of the machinery to Government. With a view to avoiding court proceedings, an offer of Rs. 1,800 by Messrs. Crossley Brothers, in full settlement of the claim to the engine, has since been accepted by Government. As soon as this amount is realized, an affidavit of claim will be filed with the Official Assignee for the balance of the Crown debt.
- (iii) *The Bellary Match Factory.*—It was stated in the previous year's report that the question of refund of certain excess interest, alleged to have been collected from the proprietor of the concern, had been under consideration. In accordance with the ruling given by the Advocate-General that only simple interest was leviable on the outstanding loan amount, the amount due to Government was recalculated and, as the amount collected was in excess of the amount due, a sum of Rs. 1,675-12-0, together with interest amounting to Rs. 96-7-0, was refunded to the borrower.
- (iv) *The Parvatipur Industries.*—The proprietors of the concern have repaid the entire balance of the loan together with interest due thereon.
- (v) *The Salem Dye Works Syndicate.*—It was stated in last year's report that the Directors of the concern had requested that they might be granted an extension of six months for payment of the fifth instalment of the loan that fell

- due on 1st January 1934. As they had not paid the fifth instalment on 1st July 1934, further extension was refused by Government, and the Collector was asked to take steps to recover the amount of the instalment. Since the sixth instalment, which fell due on 1st January 1935, has not also been paid by the Syndicate, it has been decided to recover the entire balance of the loan outstanding, and steps are being taken to this end.
- (vi) *The Tanjore Tile Works.*—The proprietor of the concern has repaid the entire balance of the loan together with the interest due thereon.
 - (vii) *Silk Reeling Concern, Bastipuram.*—The silk reeling machine was bought by the department at the auction, and the balance due from L. Nanjundaswami in respect of the loan was written off.
 - (viii) *The Ram Ram Safety Match Works, Tholampalayam.*—The machinery and other appliances of the concern were sold in auction, and an amount of Rs. 116 was realized and adjusted to the loan arrears. Steps are being taken to proceed against the collateral securities for the recovery of the balance of the loan amount and the interest due.
 - (ix) *Toy-maker K. Subbarayudu, Kondapalle.*—The statements of accounts of this concern for 1933-34 have since been received according to which the concern worked at a loss. The statements of accounts for the year 1934-35 are awaited. Mr. K. Subbarayudu represented that he was unable to repay the instalment of the loan that fell due on the 1st November 1934 and requested that he might be granted an extension of time up to the 16th January 1935 for repayment. The extension of time asked for was granted by Government, and Mr. Subbarayudu has since paid the instalment.
 - (x) *The Metal Industries, Limited, Shoranur.*—This company sustained a net loss of Rs. 4,796-11-7 on its working during the year ended 31st March 1934. The instalment of the loan due in the year 1934-35 has been paid. The potentialities of this concern are considerable, but it is suffering from lack of capital and the security is inadequate to support a further loan under the Act.
 - (xi) *Messrs. Boddu Pydenna Sons, Vizianagram.*—According to the audit report for the year ended 31st March 1934, a net loss of Rs. 9,531-5-4 was sustained on the working of this oil milling business during the year. The instalment of the loan which fell due during the year has been paid. The proprietors asked to be allowed to purchase and instal in their factory at their own risk, two Christys expellers instead of the Muller oil expeller referred to in last year's report, and they have been permitted to do so,

9. It cannot be claimed that during the period of 12 years the Act has been in force it has achieved any measure of success in stimulating industrial development, although it is generally recognized that industrial development is often retarded because banks are unable or unwilling to advance money for long periods on reasonable security, whilst advances for even short periods are often difficult to secure. Some of the new sugar factories that have come into existence have been hampered by this difficulty of finance, whilst another promising industry, the development of which is stultified by its inability to command the requisite capital, is the Metal Industries, Limited, of Shoranur, to which reference has been made in the preceding paragraph. It has been suggested therefore that, following the example of the United Provinces, a special committee should be set up to formulate a new scheme of financial aid to industries.

GENERAL ASSISTANCE TO TRADE AND INDUSTRY.

10. This work is carried on in the Bureau of Industrial and Commercial Information, the organization and objects of which are now too well known to need repetition. The main purpose of the Bureau is to provide information on industrial and commercial subjects and to answer inquiries received from the public and from Government relating to commerce, trade and industries, and economic questions generally. The inquiries have increased to a marked extent during recent years, and the consideration and answering of them now forms a very important part of the activities of the department, the Bureau having to deal daily with a large number of requests for information covering a wide range of industrial and commercial subjects. In cases where the Bureau has not got the information desired, it can usually secure it more fully and with less delay than industrial firms or private persons. The number of periodical and special reports submitted to Government and to the Director-General of Commercial Intelligence and Statistics is also steadily expanding. Close and cordial relations continued to be maintained during the period under review with the several trade commissioners, foreign consuls and other authorities, and also with the commercial and industrial public of the Presidency who avail themselves freely of the assistance and facilities afforded by the Bureau. In view of the increase in the volume and importance of the commercial intelligence work carried on in the department, I consider that the earliest opportunity should be taken to change the designation of the Director of Industries in the Madras Presidency to 'Director of Industries and Commerce', the former designation having become a misnomer, since the department is in actual fact and has been for many years a Department of Industries and Commerce. In Indian States, similar departments are styled 'Industries and Commerce', whilst there is a proposal to change the designation of the Director of Industries in the United Provinces to 'Director of Industries and Trade'.

11. A reference was made in the report of the previous year to the creation of a new branch under the Department of Commercial Intelligence and Statistics of the Government of India to conduct research on economic problems, one of the functions of which is to collect material for a monthly review of commercial conditions in the country, and in this connexion the Director-General continued to be supplied during the year with a monthly review of trade conditions in the Madras Presidency. In connexion with the Ottawa preferences, the Local Government were supplied with quarterly reports in respect of magnesite and cotton manufactures, and with half-yearly reports in respect of woollen carpets and rugs, coir yarn and matting, and myrobalans. The Director-General of Commercial Intelligence and Statistics was also supplied with half-yearly reports in respect of the industries of the Presidency affected by the Ottawa Trade Agreement, and also with a special periodical report in regard to the senna market. The Bureau continued to compile statistics relating to industries, including statements of cotton, jute, paper, and woollen mills, and mines and minerals, as also the annual review of the working of the Indian Mines Act. The annual return of large industrial establishments in the Madras Presidency coming under the operation of the Indian Factories Act, 1911, was, as usual, compiled. Summaries on the subjects of manufactures and mines and quarries were also prepared for inclusion in the administration report of the Presidency.

12. A very large number of inquiries and requests for information or assistance were received and dealt with during the year, but it is impossible within the limits of this report to refer to them in any detail. The following examples of steps taken to assist inquirers may, however, serve to illustrate the various ways in which the Bureau is of practical use in supplying information and advice on industrial and commercial subjects:—

- (i) The Association for the Development of Swadeshi Industries, Delhi, was supplied with information in regard to the processes of tin plate printing.
- (ii) A reputable firm in Vizagapatam, dealing in ivory articles, was recommended to the Director-General of Commercial Intelligence and Statistics for introduction to overseas buyers.
- (iii) A firm in Madras was supplied with information in regard to the prospects of the trade in myrobalans.
- (iv) The Registrar, University of Madras, was supplied with a list of important tanners and exporters of tanned hides and skins in Madras.
- (v) An inquirer in South Kanara was supplied with a note on the kiln drying of cloves.
- (vi) An inquirer in Guntakal was furnished with a list of suppliers in Japan of cinema projectors, silent and sound pictures, and radio gramophones.

- (vii) A note on tung oil was supplied to a firm in Madras.
- (viii) A firm in Madras was supplied with information as to the location of deposits of granite suitable for kerb manufacture in this Presidency, as also with a list of leaseholders of the mineral.
- (ix) A Government department in Calcutta was supplied with information in regard to manufacturers of Pulicat baskets.
- (x) A weaving mill at Coimbatore was furnished with the names of suppliers of Japanese, Italian, German and English made handlooms.
- (xi) An inquirer in Tanjore was supplied with the name of an institution where instruction in radio broadcasting is imparted.
- (xii) An inquirer at Vizianagaram was supplied with a list of chinaware and enamelware factories in India.
- (xiii) A prospective industrialist in Cocanada was supplied with a list of the principal manufacturers of confectionery making machinery in the United Kingdom.
- (xiv) H.M. Trade Commissioner at Calcutta was supplied with a list of manufacturers of perfumery and toilet preparations, toilet soaps, etc.
- (xv) A firm of exporters of carpets in Madras was supplied with a list of manufacturers of woollen druggets in the Presidency.
- (xvi) A Government department in Bombay was furnished with information as to the terms on which a West Coast firm of coir manufacturers would be prepared to accept apprentices for training in coir manufacture.
- (xvii) A firm in Goa was supplied with the names of suppliers of black stone slabs in Cuddapah district, and of marble stones in Guntur district.
- (xviii) A company in South Africa was supplied with information in regard to the consumption of avaram, and other local tanning barks in the Presidency.
- (xix) A Government department in the United Provinces was supplied with a list of consumers of Kamala powder in this Presidency.
- (xx) A local Government department was furnished with the names of suppliers of ochres in the Presidency.
- (xxi) A Government department in the United Provinces was furnished with information in regard to the varieties of Japanese soaps imported into the Presidency, together with a few samples.
- (xxii) A list of suppliers of machinery for the manufacture of walking sticks and umbrella handles was communicated

- to a firm of manufacturers of umbrella sticks and walking sticks in Calicut.
- (xxiii) A firm of leather manufacturers in Madras was furnished with a list of producers of turpentine in India.
- (xxiv) A wool merchant in Bellary was supplied with the names of the principal suppliers of sheep shearing machinery.
- (xxv) The Director-General of Commercial Intelligence and Statistics, Calcutta, was supplied with a list of the principal manufacturers of wooden and clay figures in this Presidency.
- (xxvi) An inquirer in Palghat was furnished with particulars of the machinery required for the manufacture of surgical or boric cotton with a daily output of 500 pounds.
- (xxvii) A department of the Government of India was furnished with the names of suppliers of beeswax in the Presidency.
- (xxviii) The names of manufacturers in this Presidency of butts and wooden parts of rifles and guns were communicated to a Government department in Calcutta.
- (xxix) A list of cotton mills in the Presidency which are in a position to supply cotton waste (for the manufacture of gun-cotton) was supplied to the Army department of the Government of India.
- (xxx) A list of manufacturers in India of denatured alcohol for industrial purposes was communicated to a firm in Palghat.

13. *Research in fruit and fruit products.*—The experiments in regard to the utilization of citrus fruits in the preparation of fruit juices and pectin were continued at the Indian Institute of Science, Bangalore, and bulk samples of fruits such as limes, lemons and oranges from different parts of the Presidency, where they are largely available, were obtained and sent to Bangalore. The experimental work has led to findings of interest and it appears that some of them can be successfully applied in technical operations. The question of demonstrating the processes evolved, and applying them on a large experimental scale, will now be taken up.

14. *Starches.*—In view of the fact that starch finds a variety of applications in art and manufacture, especially in textile industries, experiments were undertaken at the Indian Institute of Science with a view to ascertaining the possibilities of producing suitable starch which could replace the imported product. Small quantities of rice, jowar and ragi starches were prepared and sent to a large textile manufacturing company which, as a result of laboratory tests, selected the ragi and jowar starches as likely to be the most suitable for their requirements. In order, however,

to enable the company to arrive at a definite decision, a three cwt. sample of jowar starch was sent and, as a result of large scale trials carried out by them, the starch has been pronounced suitable for use in the textile industry.

* 15. *Myrobalans*.—Owing to dissatisfaction which had been expressed with the standard samples of myrobalans on which the myrobalan trade had been based in the past, owing to the standards having become obsolete, fresh standards were introduced as the basis of future business by a committee in London, consisting of representatives of Indian shippers and of users in England. As this Presidency is an important myrobalan producing area and as it was impracticable to send a set of these standard samples to every shipper in Madras, arrangements were made, in consultation with the United Tanners' Federation of London, for a set of standard samples of all the varieties of myrobalans approved by the committee to be exhibited in the Museum attached to the department for inspection by shippers and interested persons.

16. *Slate industry*.—The demonstration of the working of the locally constructed machines for the manufacture of school slates, which was arranged at the Park Fair Exhibition in Madras in 1933, was followed by the staging of another demonstration during the year in the Government Industrial School at Bellary, for the benefit of the slate workers of Markapur, where the manufacture of school slates has been carried on. The demonstration was attended by several slate merchants, the Conservator of Forests, Bellary, and the Managing Director of the Standard Furniture Works, Kallai. As the result of a study of the departmental bulletin on the slate industry, and a subsequent visit to Markapur, the proprietor of the Standard Furniture Works established a profitable side line to his factory activities by supplying the Markapur merchants with prepared framing, his annual output amounting in value to about Rs. 25,000, but he has now gone a step further, and has adopted the suggestion made in the departmental bulletin that slates might be taken to localities other than Markapur for framing, and has set up machines for preparing the frames, polishing the slates and turning out the finished product at Kallai. The slates manufactured at Kallai compare more than favourably with the imported ones.

17. *Possibilities of industrial development at Mettur*.—During the course of my tours in connexion with the disposal of the Mettur Project surplus plant and machinery, I was instructed to investigate and report on the possibilities of attracting industries to Mettur and, after my reversion to the Industries Department in January, I submitted a report to Government in which I reviewed the scope for development in the Mettur area of the following industries, amongst others: cotton spinning and weaving, manufacture of rayon and fibro, silk-waste manufacture, manufacture of vegetable product and hardened oil by the hydrogenation process, the alkali industry, connoting the production of caustic soda,

sodium carbonate, chlorine, bleaching powder, hydrogen, hydrochloric acid and other products, manufacture of ammonium sulphate and of calcium nitrate, manufacture of steel from Salem iron ores or from scrap, manufacture of magnesium from magnesite, and paper and pulp manufacture. The manufacture of several of the products referred to above will be rendered possible by the advent of cheap power in the Mettur area, although it must be recognized that, where electro-chemical industries are in question, it is essential that the price of the electricity shall be very low if the manufactured product is to compete with that produced elsewhere. I recommended that in the first instance efforts should be concentrated on carrying through a development plan, which involves not only the establishment of an alkali industry, and the production of fused caustic soda and bleaching powder in the form of sticks, but also the setting up of a mill for the crushing of cotton seed and the manufacture of compound oil-cake for cattle food, a factory for the manufacture of vegetable product, and a plant for the manufacture of ammonium sulphate by the Casale process. Shortly before the end of the year, samples of limestone and salt were collected in order to determine their suitability for the manufacturing processes. Further developments now await the completion of the analyses of the limestone and salt, and a decision as to the rate at, and the conditions under, which power could be supplied. The question whether artificial staple fibre could be manufactured was also studied and, if arrangements can be made for the manufacture of carbon bisulphide, it may be possible to induce certain textile interests to set up a mill in the Mettur area, although it must be recognized that the cost of imported pulp in sheet form delivered at Mettur would be high. On the other hand, bamboo pulp for fibro manufacture seems to be an unproved proposition, the utilization of which would involve years of experimental work, whilst short stapled cotton in India cannot at present compete with wood pulp. Cotton linters could be used and would in fact give better results than wood pulp, but the question is whether a sufficient quantity could be assembled at Mettur or any other centre at a sufficiently low price. This would require a careful and detailed investigation, but in view of the importance of the question, it should, I have suggested in my report, be undertaken. Negotiations were also in progress at the close of the year with a view to inducing the Radhasoami Satsang Sabha of Dayalbagh, Agra, to establish an educational-cum-industrial colony of their community at Mettur.

18. *Salem iron ores*.—The obstacle in the way of the development of the Salem iron ores has been the difficulty of obtaining a continuous and sufficient supply of cheap fuel, and it was suggested in my earlier report on the industrial possibilities of Mettur, that the advent of cheap power in the area would justify a re-examination of the question, and that it would probably be worthwhile verifying the existing data by arranging for a magnetic test to be carried out on a bulk sample of the ore. The quantity

of magnetite ore in the district may be considered almost inexhaustible, but a good deal of doubt exists in regard to the quality of the deposits, and as to whether the iron content is high enough to render exploitation commercially feasible. I discussed the matter at length with the officers of the Geological Survey of India at Calcutta in January, as a result of which it was considered that there were distinct possibilities in regard to smelting the Salem iron ores by using for heating purposes, the electric energy from Mettur, and for reduction, charcoal from local sources. It was recognized that the process of magnetic concentration would greatly increase costs which must be higher than usual in iron smelting when electricity is employed instead of coke for heating, and that, in these circumstances, the aim should be to manufacture high grade steel, high speed tool steel, or stainless steel. It was realized, however, that the question resolved itself on the true value of the magnetite, and the conclusion arrived at was that a re-examination of the ores would, in the changed circumstances, be justified with a view to settling once for all the uncertainty in regard to their real value. I have recommended therefore that the Geological Survey Department be asked to carry out, as early as possible, an entirely new survey of the Salem iron ore deposits, and that the officer deputed to carry out the investigation should arrange to collect the samples of ore to be sent for large scale magnetic concentration tests. This investigation is obviously of the greatest importance as, if the results of the survey are satisfactory and steel can be produced at an economic price in the Salem district, it will render possible the establishment of several subsidiary industries to the great economic advantage of the Presidency.

19. *Review of State action in respect of industries.*—The Fifth Industries Conference held at Simla in 1933 considered that it was desirable to have an All-India review from time to time, e.g., at intervals of five years, of industrial development and state action in respect of industries. Accordingly, a review of the activities of the department during the period from 1928 to 1934 was prepared during the year and submitted to the Local Government for transmission to the Government of India.

COTTAGE INDUSTRIES.

20. The rural population has been severely affected by the economic depression and the catastrophic fall in agricultural values, whilst the decay of local industries in some areas has left the rural population no supplementary source of income outside the seasonal periods of their agricultural work. It has become very necessary, therefore, to attempt to develop rural industries which would provide for the common needs of the people and produce goods for which there is a demand on the countryside. There is at present no occupation so remunerative as weaving to absorb the population not engaged in agriculture, or to keep the agriculturists occupied during the slack season, and the decision of the Government of India to give grants-in-aid for the improvement and development

of the handloom weaving industry on co-operative lines, to which a detailed reference has been made elsewhere in this report, is therefore greatly to be welcomed. The further decision of the Government of India, to distribute annually for five years grants for the benefit of the sericulture industry, also affords ground for satisfaction. There are many other cottage or small-scale industries, however, which would appear to be worthy of encouragement and which, if successfully developed, would in the aggregate go some way to alleviating unemployment on the countryside. It is possible that the promotion of rural occupations, other than handloom weaving and sericulture, could best be achieved through the medium of peripatetic industrial demonstration parties. It is by no means generally realized that Japan is largely a country of small industries and handicraft units, and that large units are not predominant in Japan. Small family enterprises are in fact a feature in Japanese industry and I cannot help thinking that the reasons for the survival of small units in Japan at a time when small-scale industries are fast disappearing in the West would repay careful study, and that the organization and technique of the cottage and small-scale industries of Japan must have many lessons for those in India who are applying their minds to the problem of the development of rural industries in this country.

21. *Agent in London for the sale of Madras industrial products.*—The annual grant of Rs. 3,000 sanctioned by Government to the authorities of the Victoria Technical Institute for a period of three years to enable them to arrange for the sale of Madras industrial products in European markets through an agent in London was disbursed early in the year under review, after the agreement with the agent had been executed. Business was regularly transacted, and articles to the value of Rs. 3,287, including the value of samples, were supplied to the agent. A considerable proportion of the agent's orders were for baskets, and he has asked for them to be made according to his measurements and designs. Considerable difficulty has, however, been experienced in inducing the Muhammadan women who make these baskets to adopt the new styles. The agent's indents, in addition to baskets, have included many of the more important articles handled by the Institute, although the samples sent of joss sticks, druggets, laces, and ivory inlaid boxes have not so far resulted in any orders. Arrangements were made by the agent for the display of a representative range of articles at the British Industries Fair, whilst the Indian Trade Publicity Officer arranged subsequently for the display of a limited number of these articles at the Milan Fair, as also at the Canadian National Exhibition at Toronto. It is too early to judge what results can be expected from the arrangement, but I am hopeful that a substantially increased demand for the products of the cottage and small scale industries of Madras will eventuate, as the agent in London is transacting a satisfactory volume of business in Bihar and Orissa products which he has been handling for some time.

22. *Improved appliances.*—Experiments were carried out with a view to the evolution of a suitable hand operated groundnut decorticator, so that, if a suitable and inexpensive machine could be produced, it might be employed to lighten ordinary agricultural labour, and add to the earning power of the ryot. As a result of the experiments, a machine has been constructed, which decorticates the nuts fairly satisfactorily, but turns out a mixture of groundnut kernels and broken outer shells. In order to separate the kernels from the broken outer shells, and otherwise complete the necessary adjustments, further experiments were in progress at the close of the year. Trials were carried out on the experimental cashewnut roaster and decorticator referred to in last year's report, in order to determine whether they could be adapted for large scale operations, but definite conclusions as to their suitability for the purposes for which they were designed have not yet been reached. A reference was made in last year's report to the manufacture and distribution by the department of a number of hearths and wooden models thereof for demonstrating the burning of paddy husk and other similar waste products for domestic use, and for instructing village blacksmiths in the manufacture of such hearths for local use. Seventeen hearths, and seventeen models, as well as twenty improved models of the hearths, were distributed during the year to District Health Officers and the departmental Assistant Industrial Engineers.

GENERAL REVIEW OF THE COMMERCIAL AND INDUSTRIAL CONDITIONS OF THE PRESIDENCY.

23. Though the year under review witnessed no general recovery of international trade, there were more definite indications of a growth of confidence, and the upward curve which started in the latter half of the previous year was fairly well maintained. There was a limited revival of industrial activity in most countries and a freer movement of commodities, especially in countries belonging to the sterling group, whilst the position of the primary producing countries improved, owing to the better prices which were forthcoming for many of the leading commodities, and also to the fact that the tendency of agricultural prices to fall more rapidly than industrial prices, which had been one of the characteristics of relative price movements during the course of the depression had been arrested, and in a number of countries even reversed, as a result of which there was some improvement in the purchasing power of primary commodities in terms of manufactured goods. The gold value of world trade fell by 3.5 per cent in 1934, and was 40 per cent only of that in 1929, though measured in sterling, the value rose by 6.3 per cent, whilst the quantum of trade increased by 3 per cent (as against 2 per cent in 1933) to a level representing 77.5 per cent of the 1929 figures. The reduction in the quantum of world trade appears to have been definitely checked, the rise in industrial production having been partly responsible for a decline in the stocks of raw materials. As compared with the previous year, wholesale prices

moved upwards in the United States, Germany and the United Kingdom, but declined in France, Belgium and Italy. The Calcutta index number (July 1914 = 100) which was 38 in March 1934, rose to 94 in January, but declined to 87 in March 1935 owing to the fall in certain commodity values in that month. On the other hand, the Bombay index number which was 93 in March 1934 advanced to 98 in March 1935. The opinion has been expressed that the world is now in the recovery phase of the business cycle and that the main factor delaying world recovery is the deepening depression in the gold bloc countries resulting from the disequilibrium between price levels in those countries and price levels in the United States and the countries that have abandoned the gold standard. Trade can only be resumed on a normal basis when these price levels come together, and this cannot occur without further drastic deflation in the gold countries, or as the result of a great improvement in business and prices in the United States and the non-gold countries, or a combination of both, or finally as a result of the revaluation of the gold currencies on a basis approximating the recent change in the value of gold in the United States. It is incontrovertible that before trade between countries again flows freely, the existing exchange restrictions must be very much relaxed or entirely removed, and, in order to bring this about, it is necessary that the currencies of the various countries should again be stabilized. The two outstanding needs of the present time are in fact the establishment of an international monetary standard promising some stability, and a removal of the artificial barriers by which trade is at present obstructed. The two problems are interdependent and opinions differ as to which of them should receive first attention. Currency stabilization in itself is only a part, although a very important part, of a larger problem embracing all the various aspects of international economic relationships, and the question of the revival of an international monetary standard of a permanent character, desirable as it unquestionably is, cannot seriously be considered apart from that of effecting some relaxation of those restrictions which obstruct world trade and render difficult the settlement of international indebtedness. The main need to-day is a revival of international trade, yet year by year clearing agreements, import quotas and exchange restrictions have increased. In 1934, there were further additions and at the end of the calendar year they numbered 114 involving no fewer than 36 countries. Unless the tendency to heap up trade barriers is definitely reversed, there is ground for apprehension that the gradual process of recovery which has been in evidence during the past two years in practically all countries will eventually come to an end. The outlook has undoubtedly improved since a year ago, but it is still obscure and there is little cause for complacence. The measure of improvement from now onwards will largely be governed by the extent to which international financial and political conditions shape themselves to a greater degree of stability than exists to-day.

24. The Bank rate remained unchanged at 3½ per cent throughout the period under review, it having been reduced to that figure in February 1933. The total value of cheques passed through the Madras Clearing House during the year ended 31st March 1935 was Rs. 56,22,16,756 as compared with Rs. 52,20,51,911 in the previous official year, a reflection of increased trading activity. The total earnings of the South Indian Railway Company, Limited, during the year under review amounted to Rs. 5,51,36,281 as against Rs. 5,37,12,772 in the previous year. On the other hand, the total receipts of the Madras and Southern Mahratta Railway Company, Limited, declined from Rs. 7,72,38,186 in 1933-34 to Rs. 7,47,09,618, owing largely to the restricted movement of groundnuts as a result of the greatly reduced crop. The total value of the trade of the Madras Presidency increased by 9 per cent. In the case of private merchandise, imports from foreign countries increased by Rs. 254·12 lakhs to Rs. 1,735·12 lakhs or by 17 per cent. Imports of grain, pulse (chiefly broken rice), machinery, metals, twist and yarn, motor cars, dye-stuffs, instruments and manures showed a considerable increase, whilst cotton manufactures, sugar, paper, silk (raw and manufactured), tobacco and soap, registered decreases. Exports of private merchandise also increased though to a small extent, that is, by Rs. 44·83 lakhs to Rs. 2,509·05 lakhs or by 2 per cent. Raw cotton, fruits and vegetables (chiefly cashew kernels), oil-cakes, and tea increased, whilst groundnuts, leather, coffee, cotton manufactures, tobacco, and hides and skins registered decreases. Shipments of gold declined from Rs. 333·22 lakhs to Rs. 106·54 lakhs. Experience in the slump years has brought so general recognition of the fact that the only real basis for a permanent world trade revival must be a sustained rise in primary commodity values that movements in these are ordinarily scanned with the closest interest. The Madras Presidency, in common with the rest of the world, continued to suffer during the period under review from the low prices ruling for primary products. Nevertheless, as will be seen by a reference to the table of monthly prices of commodities, there were appreciable rises in the prices of many commodities. Individually of course commodities varied in their rate of progression, and some did not progress at all, from the price level standpoint. Values of cotton, jute, groundnuts, paddy and rice, copra, coconut-oil, castor oil and castor seed were appreciably higher on the 31st March 1935 than at the corresponding period of the previous year, but tanned cow hides, tanned goat skins, tanned sheep skins, sugar, pepper, coir yarn and myrobalans were standing at lower levels.

Average monthly wholesale prices of some of the principal Madras commodities during the year 1934-35.

Commodities.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
RS. A. P. RS. A. P. RS. A. P. RS. A. P. RS. A. P. RS. A. P. RS. A. P. RS. A. P. RS. A. P. RS. A. P. RS. A. P. RS. A. P. RS. A. P.												
Cotton (Cambodia), per catty of 520 lb., ..	153 10 8	154 2 0	156 4 10	153 10 0	163 3 3	161 12 0	160 0 0	163 12 0	176 10 8	196 4 0	200 0 0	185 0 0
Cotton (Karrungani), per catty of 520 lb., ..	143 8 0	142 10 0	144 4 10	144 6 0	151 0 0	150 0 0	147 8 0	151 8 0	164 0 0	176 14 0	181 4 0	183 12 0
Groundnuts (Nandyal), per catty of 531 lb., ..	13 15 4	16 3 0	15 14 5	16 7 6	19 11 5	22 2 0	23 13 9	21 15 0	24 1 0	33 1 0	35 1 6	32 12 0
Groundnuts (Colimabore), per catty of 531 lb., ..	27 6 8	29 3 0	29 3 2	28 3 0	28 3 7	31 13 0	29 2 0	21 10 0	22 5 4	23 8 0	30 0 0	26 11 2
Pepper, per cwt. of 164 lb., ..	2 13 2	3 4 10	3 5 7	3 5 9	3 14 2	4 2 9	5 5 0	3 5 0	4 3 0	4 1 9	4 6 6	4 7 0
Paddy, per bag of 164 lb., ..	3 7	4 15 6	5 8 0	5 8 0	5 14 7	6 5 6	7 3 9	6 14 0	6 8 0	5 8 3	6 8 0	6 6 5
Rice do.												
Coir yarn, per catty of 672 lb., ..	68 0 0	68 0 0	68 0 0	68 0 0	68 0 0	62 0 0	60 0 0	60 0 0	61 5 4	62 0 0	62 0 0	62 0 0
Copra, per catty of 655 lb., ..	32 0 0	35 12 0	36 1 7	35 8 0	37 8 0	39 6 0	41 12 0	39 14 0	42 10 8	55 14 0	49 12 0	45 4 10
Coconut oil, per catty of 655 lb., ..	50 13 4	54 12 0	54 4 10	53 0 0	56 9 7	59 14 0	61 12 0	58 11 0	60 10 8	81 12 0	74 6 0	67 10 5
Jute, per catty of 506 lb., ..	29 8 0	31 2 0	30 2 5	27 14 0	27 9 7	27 0 0	27 0 0	27 4 0	28 10 8	33 12 0	34 2 0	32 6 0
Tobacco, per maund of 28 lb., ..	6 0 0	6 0 0	5 12 10	5 8 0	5 8 0	5 9 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0	6 0 0
Myrobala, per bag of 164 lb., ..	2 13 0	2 12 0	2 11 0	2 11 0	2 12 0	2 11 0	2 10 4	3 0 0	2 12 0	2 11 6	3 0 0	2 8 6
Castor oil, per catty of 500 lb., ..	49 2 0	50 2 0	48 14 0	49 10 0	51 12 0	52 10 0	54 15 4	53 6 0	54 10 0	65 2 0	63 2 0	61 6 0
Castor seed, per bag of 164 lb., ..	7 3 0	7 5 0	7 6 0	7 4 0	7 7 0	7 10 0	7 13 8	7 13 6	8 0 0	9 0 0	9 7 0	9 6 0
Java sugar, per cwt., ..	13 13 10	13 8 10	13 5 10	13 9 1	13 7 4	13 9 3	13 5 6	13 2 3	13 5 6	13 10 0	13 10 0	13 10 8
Nellikuppam sugar, per cwt., ..	13 8 10	13 6 6	13 5 0	13 8 4	..	..	..	..	12 15 1	13 1 8	12 13 8	12 13 8
Channapatia sugar, per cwt., ..	13 5 8	13 4 3	13 3 4	13 6 0	13 4 3	13 6 6	..	..	12 11 0	12 12 0	12 12 9	12 7 6
Tanned cow hides— Bangalore, 8-8½ lb., per lb., ..	0 8 2	0 7 10	0 7 6	0 7 4	0 7 2	0 6 8	0 6 9	0 6 10	0 7 1	0 7 8	0 7 11	0 7 0
Up-country, per lb., ..	0 7 9	0 7 7	0 7 4	0 7 2	0 6 11	0 7 3	0 6 6	0 6 7	0 6 9	0 6 8	0 7 3	0 7 0
Cosate, 7-¾ lb., per lb., ..	0 8 1	0 7 10	0 7 7	0 7 6	0 7 3	0 7 0	0 6 11	0 6 10	0 7 1	0 7 0	0 7 2	0 7 0
Tanned goat skins— Good, per lb., ..	1 9 1	1 8 1	1 6 10	1 6 0	1 4 3	1 3 4	1 2 6	1 2 7	1 2 9	1 3 2	1 3 0	1 4 0
Fair, per lb., ..	1 7 6	1 5 6	1 5 1	1 4 4	1 2 10	1 2 2	1 1 6	1 0 6	1 0 6	1 1 2	1 2 0	1 2 8
Common, per lb., ..	1 5 7	1 4 6	1 3 11	1 3 0	1 1 6	1 0 4	0 15 6	0 15 6	0 15 6	1 0 8	1 0 8	1 0 8
Tanned sheep skins— Good, per lb., ..	1 11 0	1 10 4	1 10 0	1 10 0	1 10 0	1 9 10	1 8 9	1 8 4	1 7 9	1 7 6	1 7 10	1 7 11
Fair, per lb., ..	1 8 9	1 8 0	1 7 7	1 7 4	1 6 9	1 5 6	1 5 6	1 5 3	1 4 6	1 4 6	1 4 11	1 4 11
Common, per lb., ..	1 3 8	1 3 4	1 2 6	1 1 10	1 0 0	0 15 9	0 15 6	0 15 6	0 15 6	0 15 7	0 15 11	0 15 11

25. *Inter-Empire trade.*—The trade with the British Empire during the year represented 59·52 per cent of the total foreign trade of the Presidency compared with 60·15 per cent in 1933–34 and 58 per cent in 1932–33. Imports increased by Rs. 16·11 lakhs to Rs. 855·95 lakhs or by about 2 per cent, and exports by Rs. 124·65 lakhs to Rs. 1,667·40 lakhs or by 8 per cent. While imports from the United Kingdom increased by Rs. 7·71 lakhs to Rs. 736·13 lakhs or by 1 per cent, exports to that country advanced by Rs. 94·25 lakhs to Rs. 1,264·57 lakhs or by 8 per cent. The percentage of the trade with the United Kingdom to the total overseas trade of the Presidency, however, declined from 47·93 per cent in 1933–34 to 46·95 per cent in the year under review, although this compares with 44·89 per cent in 1932–33. The importance to the Madras Presidency of the increase in the export trade with the British Empire, and with the United Kingdom, will be realized from the fact that notwithstanding such increase, the total export trade of the Presidency with all countries advanced by Rs. 44·28 lakhs only. In other words, had it not been for the increased takings of Madras produce by the United Kingdom, and other parts of the British Empire, the total exports of the Presidency would, as compared with the previous year, have shown a decrease in value. The following products, amongst others, contributed to the increase in exports to the United Kingdom: groundnuts, groundnut-cake, tea, rubber, goat skins tanned, manganese ore, coir manufactures, and woollen carpets and rugs. Exports of groundnuts to the United Kingdom more than trebled, both in quantity and value, rising from 35,147 tons valued at Rs. 44·29 lakhs to 119,051 tons valued at Rs. 151·10 lakhs, the United Kingdom accounting for over 25 per cent of the total quantity of groundnuts exported by sea to foreign countries and 30 per cent of the value. On the other hand, there were decreases in the exports to the United Kingdom of cow hides, raw cotton, tobacco, coffee, castor seed, handkerchiefs and shawls and some other products of less importance.

26. *New industrial undertakings.*—One hundred and ninety-six companies were registered during the year, 189 with, and 7 without, share capital. The authorized capital of the companies registered amounted to Rs. 446·61 lakhs and the paid up capital to Rs. 22·52 lakhs, as against Rs. 480 lakhs and Rs. 51·7 lakhs in the year 1933–34. Of the new registrations, 106 were trading and industrial concerns, 44 banking, 17 transit and transport, 13 insurance companies and 16 others. Nine public utility concerns for the supply of electricity, two sugar factories, and a steam ship company were registered during the year. The companies floated with the largest authorized capital were: The South Indian Fire and General Insurance Company (Coimbatore), Limited, (Rs. one crore), Indian Relief Bank, Limited, (Rs. 25 lakhs), Indo-Carnatic Bank, Limited, and East India Bank, Limited, (Rs. 20 lakhs each), Gnanambika Mills, Limited, and Coimbatore Murugan Mills, Limited (Rs. 11 lakhs each), Malabar Steamship Company, Limited, Premier Bank of India, Limited, and

South Indian Film Corporation, Limited (Rs. 10 lakhs each), and the India Investment Trust Corporation and Deposit Bank, Limited, and Ellore Electric Supply Corporation, Limited (Rs. 7 lakhs each). In addition to the two cotton mills already mentioned, six others were floated during the year with their registered offices at Coimbatore, four with a capital of Rs. 6 lakhs each, and two with a capital of Rs. 5 lakhs each.

27. *Mining operations.*—The following prospecting licences and mining leases were granted during the calendar year 1934:—

	ACRES.
Thirty-three prospecting licences for prospecting for barytes over an area of	1,443·00
Four prospecting licences for prospecting for mica over an area of	131·49
Four prospecting licences for prospecting for kaolin or china clay over an area of	61·64
Two prospecting licences for prospecting for asbestos over an area of	204·31
Two prospecting licences for prospecting for copper ore over an area of	63·44
One prospecting licence for prospecting for manganese over an area of	601·00
One prospecting licence for prospecting for iron ore and manganese over an area of	77·60
One prospecting licence for prospecting for steatite over an area of	48·16
One prospecting licence for prospecting for red oxide of iron over an area of	20·00
One prospecting licence for prospecting for lead, zinc, and barytes over an area of	16·00
One prospecting licence for prospecting for kyanite over an area of	7·19
One prospecting licence for prospecting for aluminium silicate over an area of	4·00
Four mining leases for working barytes over an area of ..	307·31
Three mining leases for working mica over an area of ..	164·47
One mining lease for working clay over an area of ..	1,265·72
One mining lease for working corundum over an area of ..	546·44
One mining lease for working phosphatic nodules and gypsum over an area of	430·22
One mining lease for working limestone over an area of ..	415·14
One mining lease for working manganese over an area of	367·56
One mining lease for working lead, silver, zinc and antimony over an area of	19·11
One mining lease for working gold over an area of ..	8·48

Mining was carried on during the calendar year 1934 in the districts of Cuddapah, Kurnool, Nellore, the Nilgiris, Salem, Trichinopoly, Vizagapatam, and Anantapur.

28. *Manganese.*—The mining of manganese was restricted to the Vizagapatam district, and the output of the mineral rose further from 16,698 tons in 1933 to 20,145 tons in 1934. Exports of

manganese during the year under review rose further from 70,940 tons valued at Rs. 10,65,770 in 1933-34 to 196,018 tons valued at Rs. 29,89,415 in the year under review. Of this quantity France took over 100,000 tons valued at Rs. 15.67 lakhs, Japan over 52,000 tons valued at Rs. 7.56 lakhs, the United Kingdom nearly 25,000 tons valued at Rs. 4.59 lakhs and Belgium over 16,000 tons valued at Rs. 2.07 lakhs.

29. *Magnesite*.—The output of magnesite during the year recorded a slight increase from 11,131 tons in 1933 to 11,859 tons in 1934. Exports of magnesite during the year, however, registered a slight fall, i.e., from 73,350 cwts. valued at Rs. 4,19,784 to 69,320 cwts. valued at Rs. 3,46,639, of which the United Kingdom alone took 58,320 cwts. valued at Rs. 2,70,524 as against 47,855 cwts. valued at Rs. 2,83,534 during the previous year. It will be seen that the quantity of exports to the United Kingdom has maintained its upward trend though the value has shown a slight decrease.

30. *Mica*.—The output of mica during the year decreased further from about 404 tons in 1933 to about 386 tons in 1934. The mica market continued dull, though there were signs of a revival of trade towards the close of the year, and this resulted in the opening of a few small mines in the Nellore district. Exports of mica increased in quantity from 10,021 cwts. to 10,275 cwts., but the value fell from Rs. 9,14,852 in the previous year to Rs. 7,72,770 in the period under review.

31. *Other minerals*.—The production of barytes in the districts of Cuddapah, Kurnool, and Anantapur increased from 2,330 tons to 2,899 tons. For the first time since 1926, 40 tons of steatite were produced in the Presidency during the year 1934. The production of phosphatic nodules in the Trichinopoly district showed a slight increase from about 37 tons in 1933 to 59 tons in 1934. The production of gypsum on the other hand declined from about 98 tons to 55 tons.

32. *Cotton*.—The area under cotton in 1934-35 was estimated at 2,271,800 acres against 2,095,800 acres for the previous year, representing an increase of 4.5 per cent over the finally recorded area of 2,174,738 acres in 1933-34. The yield was estimated at 454,900 bales against 451,690 bales in the previous year, or an increase of 0.7 per cent. Exports improved from 17,860 tons valued at Rs. 111.33 lakhs in the previous year to 26,335 tons valued at Rs. 174.35 lakhs in the period under review, representing an increase of 47 per cent in weight and 57 per cent in value. Japan took 54 per cent of the exports, and the United Kingdom 16 per cent. Smaller quantities were taken by Belgium, France, Italy and Germany. Prices of cotton advanced appreciably during the year.

33. *Cotton mills*.—There were 31 cotton spinning and weaving mills at work in the Madras Presidency with 919,620 spindles and 5,597 looms. The mill production of yarn during the year

amounted to 103.10 million pounds compared with 98.27 million pounds in the previous year. The mill production of cloth also increased during the year from 65.34 million yards to 75.17 million yards. A feature of the spinning side of the industry was the further increase in the production of higher count yarns, namely, 40s and above, from 9.80 to 16.70 million pounds. The spinning section of the industry was in a very depressed condition at the commencement of the year, owing to imports of Japanese and Chinese yarns at dumping prices, and severe internal competition and over-production, whilst a further factor in falling cotton prices made the outlook far from hopeful. When the new tariffs came into force in May, shipment markets of South Indian mills were affected, but the Bombay mill strike in the same month benefited the mills somewhat and, with firmer cotton prices, rates were raised. Prices were advanced at intervals until January when prices were reduced. The year under review, from the spinner's point of view, was definitely better than previous years, and all the mills were able to dispose of their output. A considerable quantity of yarn, mainly 40s count, was sent to Bengal. The year also opened unfavourably for the weaving section of the industry and difficulty was experienced in effecting satisfactory sales. Apart from the fact that the market was heavily burdened with stocks, both of indigenous and foreign manufacture, the weakness in the price of the raw material had an unsettling effect on cloth buyers. Higher cotton prices ruling later in the year had a beneficial effect on trading conditions and there was an improvement in demand from July onwards which was fairly well maintained up to the end of December, but at all times it was difficult to transact business at prices which showed manufacturers a reasonable return. Japan's exports of artificial silk goods to India during 1934-35 showed a substantial increase over the previous year and, although the volume of this trade has not yet attained the substantial proportions of the year 1932-33, there is every evidence that the trade is becoming seriously detrimental in its effect not only on the Indian mill industry, but also on the handloom weaving industry of this country. The introduction of shorter working hours in January presented Indian manufacturers with a further problem in the shape of an increase in production costs. The year ended much as it had begun with dealers hesitating to buy. There were, however, signs of recovery in the price of the raw material which it was hoped would, in spite of the depressing effect of heavy importations of Japanese goods and forced sales by Indian manufacturers, lead to a resumption of demand for Indian made goods at economic prices.

34. *Hosiery*.—There were seven organized factories working and the production increased from 669,169 lb. or 181,491 dozens in the previous year to 1,228,295 lb. or 305,913 dozens in the period under review. Demand was maintained at a satisfactory level during the year, but owing to continued keen competition, price levels showed little or no profit to manufacturers. The

demand was mainly for the cheaper qualities of goods, the prices of which had to be cut to a very fine margin to enable any substantial business to be booked.

35. *Madras handkerchiefs*.—Exports of Madras handkerchiefs declined from Rs. 18.4 lakhs in the previous year to Rs. 12.45 lakhs in the period under review. The year commenced with a higher level of prices, weaving rates having increased as a result of the weavers' strike which took place in the previous year. The weavers, however, failed to maintain their resolutions, and prices fell steadily until by the end of the year they were lower than they had been before the strike. The improvement in economic conditions on the West Coast of Africa was reflected in an increased demand for Madras handkerchiefs during the last few months of the official year, and by the end of March most districts had full work and prices were advancing sharply. A feature of the Madras handkerchief business recently has been the great improvement in the average standard of quality, which is said to be due to the legal action instituted against the suppliers of inferior yarns. Formerly, a large quantity of yarn in the market was marked 40s and contained 200 hanks, but the yarn was very coarse and short in length, and resulted in the weaving of a coarse cloth. The legal action taken in a few cases proved salutary and, as the weavers are now using proper 40s, the quality of the cloth produced has greatly improved.

36. *Jute mills*.—There were four jute mills at work in the Presidency during the year, i.e., at Nellimarla, Chittivalasa, Ellore and Guntur. The number of looms and spindles in the mills was 966 and 22,692 respectively. The demand from local consuming centres was fairly steady throughout the year, and prices fluctuated within narrow limits. In anticipation of the success of the Bengal Government Jute Restriction Scheme, the price of raw jute advanced slowly, and at the end of the year was standing at a higher level than for some time past. No corresponding advance, however, has taken place in the finished goods market and, until prices of the latter improve, manufacturing prospects cannot be considered satisfactory.

37. *Tanning industry—General*.—Exports of tanned hides declined from 12,584 tons to 10,969 tons, but exports of tanned skins increased from 5,892 tons to 6,043 tons. The total value of leather exported fell from Rs. 524.77 lakhs in 1933-34 to Rs. 504.17 lakhs in the year under review. Almost the entire quantity of tanned hides and tanned goat skins, and by far the greater portion of the sheep skins exported, went to the United Kingdom, shipments to that country comprising, cow hides 9,208 tons valued at Rs. 156.19 lakhs, buff hides 632 tons valued at Rs. 10.54 lakhs, buff calf skins 394 tons valued at Rs. 7.18 lakhs, cow calf skins 652 tons valued at Rs. 15.06 lakhs, goat skins 3,259 tons valued at Rs. 167.84 lakhs, and sheep skins 1,940 tons valued at Rs. 99.41 lakhs.

38. *Tanned cow hides*.—At the commencement of the period under review no minimum prices were in force for tanned cow hides, and during the first six months there was a steady decline in the market. Prime Bangalore cow hides were selling at 13d. per lb., c.i.f., London, in March 1934, prices dropped in October to 12d., early in November the market weakened by about a further $\frac{1}{2}$ d., and as a consequence on the 21st November the minimum prices were reimposed. Prices generally firmed up a $\frac{1}{2}$ d. to a penny per lb. during December but, on account of larger shipments in January and February, prices declined by about $\frac{1}{2}$ d. during March. It is difficult to judge whether prices were remunerative to tanners during the year. Shipments averaged about 3,000 bales per month as against about 3,200 bales per month during the previous twelve months, and this would seem to indicate that tanners were able to make a small margin of profit. The main feature of the trade during the year was the continued demand for very low quality hides which are described as Inferior fifths. The British curriers still find export business very difficult, since conditions in the United States of America, their largest customer, have not improved to any great extent. The English market alone can barely absorb 3,000 bales per month, consequently unless shipments decline, no permanent improvement in prices can be expected in the near future.

39. *Tanned goat skins*.—For the first eight months in the year, prices were slowly and steadily falling. A well known mark of middle class goats which was quoted at about 37d. per lb. in March 1934, was quoted at about 33d. per lb. in November. Fifth selection goat fell by about 5d. to 6d. per lb. From January onwards, however, the market recovered to some extent, and the public sales in that month and in March recorded advances totalling about 3d. per lb. on average. The trade in tanned goat skins has been considerably affected by outside influences, prices not being governed so much by supply and demand as by international financial restrictions. German leather dressers are normally the largest buyers of tanned goat skins in the public auctions, and they have been considerably hampered in their operations owing to German exchange restrictions. It is very difficult to judge the future trend of the market but, if German buyers are not in a position to buy, prices may be expected to fall.

40. *Tanned sheep skins*.—Prices for these generally followed prices of goats except that the fall in the fifth selections was more marked. On the whole there was a good steady demand for middle class sheep, but the very prime qualities were not in good request except on a few occasions. The English dressers are the main buyers of tanned sheep skins and since internal trade in England has been good, the fluctuations in the prices of tanned sheep have only been small.

41. *Tanned cow calf*.—Prices during the first five months of the period under review dropped rapidly, the price for Prime

Bangalore Cow Calf in March being 22½d. per lb. and in August 18½d. The market was maintained at about this level for two or three months, and in January prices advanced to 20d. and fell again in March to about 19d. As usual, prices of cow calf seem to have followed the general trend of prices of goat skins. Shipments during the period under review do not show much change in comparison with the previous year.

42. *Buffalo hides.*—The market for these remained fairly steady and average prices fluctuated only about one penny per lb. during the year, the general trend of prices following that of cow hides. On account of the demand for very cheap leather, some of the users of buff hides substituted inferior fifths cow hides, but in spite of this, shipments remained fairly steady. At the end of the period under review, the United States of America appeared again as buyers but the quantities taken were not large.

43. *Buff calf skins.*—These have been almost neglected throughout the year and shipments have been very small on account of the very low prices ruling.

44. *Reptile skins.*—Except for a small amount of tanning of whip snake skins, this trade has been very dull indeed. The competition of reptile skins from Africa has been very severe, and prices generally have been at very low levels. The demand for python skins has been fairly well maintained, but here again African skins on account of their lower prices, and Saigons, because of their more attractive markings, have competed with Indian skins.

45. *Finished leather manufactures.*—The local demand remained dull, and was only for low priced inferior quality boxesides. In glaze kid, the local demand was much better and buyers have been interested in higher qualities of blacks and in colours to take the place of imported leather. The export trade in boxesides has expanded very considerably, and Indian chrome tanned boxesides appear to be taking the place of the German product, the chief raw material of which was Indian raw cow hides. The majority of the exports are to the United Kingdom, but an increasing trade is being done with South Africa and other British Colonies. The export trade in glaze kid has also considerably increased, and tanners now appear to be able to produce finished leather equal in quality to that produced in the United Kingdom.

46. *Sugar industry.*—The area planted with sugarcane up to 25th December 1934, was estimated at 122,470 acres as compared with 120,250 acres for the corresponding period of the previous year, representing an increase of 1·8 per cent. The final area for the previous year was 121,650 acres, and the estimate of that year fell short of the final area by about 1·2 per cent. The yield was estimated at 320,940 tons of jaggery, against 324,550 tons estimated in January 1934, a decrease of 1·1 per cent. The final estimate for 1933-34 was 349,000 tons. Imports amounted to 49,793 tons valued at Rs. 43·43 lakhs compared with 53,884 tons

valued at Rs. 56·18 lakhs in 1933-34. The United Kingdom supplied only 369 tons of refined sugar against 9,982 tons in the previous year, and the balance of 49,424 tons came entirely from Java. Owing to keen internal competition, the price of sugar declined to some extent during the year, and prices of North Indian sugars were below Java parity throughout the period under review.

47. Although it is becoming recognized that the Madras Presidency is one of the most suitable parts of India for sugarcane cultivation, the possibilities of the sugar manufacturing industry are even now not fully appreciated. As the fall in prices of primary commodities has been greater than that of manufactured articles, the economic depression has been felt severely in Madras, and by none more than by the paddy cultivator whose income has been reduced considerably owing to the fall in rice prices. There is no reason why, in the changed economic circumstances, a portion of the land now utilized for growing paddy should not be diverted to the growing of sugarcane. The deep-rooted varieties of cane which have been evolved at Coimbatore, and require very little water are, as stated in the Administration Report of the previous year, especially suitable for the conditions which obtain in several areas of the Presidency, including the deltas, the total extent of which is equal to the cultivated area of one of the largest sugar producing countries in the world, and in the Kistna district a considerable area has been cultivated with some of the deep-rooted varieties of Coimbatore cane. The question of the extent to which the industry can be developed will no doubt resolve itself into one of yield and production costs, and the position in this respect is very much better than is generally recognized. In Queensland, Cuba, Mauritius, Phillipines and South Africa the yield of cane is less than 20 tons per acre. In Northern India the yield is about 16 tons, but in the Madras Presidency the average yield is about 27 tons per acre, while in the delta districts yields of over 30 tons per acre are forthcoming. It will be seen, therefore, that the yields of cane per acre in the Madras Presidency compare favourably with those of Northern India, and of other sugarcane producing countries, with the exception of Java and Hawaii Islands where the yields are exceptionally high. There were eleven sugar factories at work during the year exclusive of the Mysore and Thuckalay (Travancore) factories. The combined maximum output of these 13 factories is estimated at 43,000 tons per annum. When the factories at present under construction, or in course of extension, are in full operation, it is estimated that the sugar production in South India will amount to 59,100 tons. It is difficult to arrive at an accurate estimate of the total consumption of sugar, for not only is the value of the railborne statistics vitiated by the difficulty of distinguishing between external and internal movements of trade, but the railway authorities seem to be unable to distinguish between sugar and gur, and the large exports from the Madras Presidency shown in the

railborne statistics undoubtedly refer to jaggery or gur. The consumption has been variously estimated at from 90,000 tons to 110,000 tons of sugar per annum, and probably amounts to at least 100,000 tons. It will be apparent, therefore, that there is still scope for the development of the sugar industry, and that if Madras is to increase its manufacturing capacity up to the limits of its consumption of sugar, it will be necessary to bring another 20,000 acres under sugarcane cultivation, and to erect further factories, although it is probable that the gap between consumption and production will, during the next few years, be bridged to some extent by increasing the productive capacity of some of the existing factories. If new factories are not set up, or if the present factories are not extended, the balance of the Presidency's requirements of sugar which were formerly derived from Java, and are now obtained from Java, Northern India and Mysore, will in future be almost entirely drawn from adjacent Indian States and Northern India, and the full benefit of the protection afforded to the industry will not accrue to the Madras Presidency.

48. The department continued, during the year, to assist in every way possible, the development of the new sugar factories which have come into existence. The factory of the Sri Ramakrishna Co-operative Industrial and Credit Society, Limited, Thummapala, started crushing on the 4th February and finished working two days after the close of the year under review. Owing to certain mechanical difficulties experienced in the milling section, the number of working days was restricted to 46 days, during which period 1,154 tons of cane were crushed from which 83.34 tons of marketable sugar and 44.8 tons of waste molasses were obtained, the yield of sugar on cane was 7.2 per cent and that of waste molasses 3.9 per cent. The factory worked at a loss. The factory of the Etikoppaka Co-operative Industrial and Credit Society, Limited, Etikoppaka, commenced crushing on the 19th January and closed 15 days after the close of the official year, the actual number of working days being 74. 2,790 tons of cane were crushed, from which 228.22 tons of sugar were obtained, the yield of sugar on cane thus working out to 8.18 per cent. Owing to the failure of the sugarcane crop, the cane supplied to the factory was insufficient, and a loss was sustained on the season's working. The factory of the Sreerama Sugar Mills, Limited, Bobbili, worked for 83 days and crushed 8,108 tons of cane from which 847 tons of sugar and 222 tons of molasses were obtained, the percentage of sugar recovery on cane being 10.44, and of molasses 2.74. The Sri Ramakrishna Sugar Factory, Kirlampudi, was under construction until 12th February, and from that date to the 10th March, a number of trial runs were made with about 600 tons of cane, regular work being carried on from 10th March to the end of April 1935. The Coimbatore Lakshmi Sugar Mills, Limited, Podanur, worked for 186 days, and crushed 2,783 tons of sugarcane from which 235 tons of sugar were obtained, the percentage of extraction being 8.4 per cent. The India Sugars and

Refineries, Limited, Hospet, were handicapped owing to the shortage of cane supplies due to the abnormally high price of jaggery ruling during the operating season. The factory commenced crushing on the 18th January and finished on the 6th March 1935, the season covering a period of only 48 days, during 13 of which the mill was closed down awaiting cane. Four thousand six hundred and eight-three tons of cane were crushed, from which 446.2 tons of sugar were manufactured, giving an yield of 9.44 per cent of commercial sugar on cane. Reference was made in last year's report to the formation of the Vuyyuru Co-operative Industrial and Credit Society, Limited, for the purpose of establishing a 850-ton sugar factory at Vuyyuru in the Kistna district, and to the fact that the society had been granted a loan of Rs. 10 lakhs by the Madras Provincial Co-operative Bank, Limited, on the security of the unencumbered lands of the members. The Society consists of 529 members, and 4,800 shares were allotted to, and about a lakh of rupees collected from, them during the year. The construction of the factory was started in December and all the machinery and plant had been received by January. Considerable difficulty, however, was experienced owing to the nature of the subsoil, and the presence of springs which delayed the laying of the foundations. It is hoped that the construction of the factory will be completed in time to enable crushing to be started in December 1935. At the instance of the department, specially reduced rates for the transport of sugarcane seed from Anakapalle, Poonna, Repalle, Tenali, and Coimbatore to Hospet, and for sugarcane from the Nizam's Dominions to Hospet were introduced by the Madras and Southern Mahratta Railway Company, during the year. The department was also instrumental in securing reduced rates for the transport of sugarcane from Kinnattukidavu, Kovilpalaiyam, and Pollachi to Podanur junction. Special freight rates for the transport from Madras of structural materials required for the Vuyyuru Co-operative Industrial and Credit Society, Limited, were also secured. These concessions in freight rates were of real benefit to the factories concerned, and the efforts of the department on their behalf were greatly appreciated.

49. *Oil-seeds—Groundnuts.*—The area and yield of groundnuts have been estimated at 2,323,300 acres and 892,800 tons as against 3,830,400 acres and 1,776,700 tons in the previous year, the crop being about 40 per cent below normal. There was, however, a considerable balance of the 1933-34 crop in the Ceded districts which was available for export during the year under review. Exports of groundnuts to foreign countries decreased from 455,337 tons valued at Rs. 544.61 lakhs in the previous year to 436,350 tons valued at Rs. 499.76 lakhs in the period under review. Shipments of groundnuts formed 90 per cent of the total trade in seeds, as in the previous year. The price per candy of machine shelled groundnuts in April 1934 was Rs. 19-7-0 compared with Rs. 26-14-0 in April 1933. It advanced to Rs. 29-8-0 in September, and after declining slightly in the following two months, rose

to Rs. 41-9-0 in January, but fell again to Rs. 38-2-0 by the end of the official year. The year was a difficult one for the oil-seeds exporter owing to the restrictions placed by Continental countries on purchases of Indian groundnuts, and the wide movements of the exchanges. On the other hand, owing to the low prices ruling for oil-seeds, sowings in the producing countries were greatly reduced and the crops were also later on affected by drought. Similar conditions prevailed in the Madras Presidency also, with the result that oil-seed crops were much smaller than in the previous year and this accounted for the advance in price. There has been a considerable fall in the tonnage and value of groundnut exports during the last five or six years owing mainly to (i) the world economic depression, (ii) the preferential tariff policy adopted by France in regard to the produce of its own colonies, and (iii) the endeavours of Germany to become as self-supporting as possible in the production of oils and fats. It is therefore very necessary that everything possible should be done to extend the industrial utilization of vegetable oil-seeds as a raw material. It is hoped that the recent imposition of a duty of 10 per cent ad valorem on the import of soya-beans into the United Kingdom will be of assistance to the groundnut producers of the Presidency, as it should favour the use of Empire produced vegetable oil-seeds.

50. *Castor*.—The area sown with castor up to 25th November 1934 was estimated at 289,200 acres as against 319,400 acres for the corresponding period of the previous year, representing a decrease of 9.5 per cent. The yield has been estimated at 26,100 tons against 32,700 tons in the preceding year. Exports of castor seed by sea decreased in quantity from 46,720 tons to 34,666 tons or by 25 per cent, and in value from Rs. 57.74 lakhs to Rs. 41.78 lakhs or by 28 per cent. The United Kingdom took 14,190 tons as against 15,955 tons in the previous year.

51. *Oil milling*.—The oil milling industry does not seem to have made much progress during the year for, although values of oil-seeds, oil and oil cakes advanced to some extent, price levels were still unremunerative. Imports of coconut oil into the Madras Presidency from Ceylon increased from Rs. 1.76 lakhs to Rs. 4.80 lakhs. The price of coconut oil at Cochin which was Rs. 52 per candy of 656 lb. in April 1934, rose to Rs. 93 in January 1935, from which level it reacted to Rs. 62 by the end of the year. Groundnut oil stood at Rs. 200 per ton at the commencement of the year, and rose to Rs. 350 per ton by the middle of January consequent on the failure of the crop, but declined to Rs. 320 per ton by the end of March. Castor oil, as well as gingelly oil, improved in price during the year. Imports of unrefined groundnut oil into the United Kingdom from all sources have declined considerably during the last three years, and the reason for this fall formed the subject of correspondence with the Indian Trade Commissioner during the year under review. The groundnut oil producers of the Presidency have suffered from the action of the

Hyderabad State in levying an export duty on groundnuts, and permitting the export of groundnut oil duty free, which has resulted in the expansion of the oil milling industry of the State at the expense of that in British India. A report was submitted to Government in November of the year under review, in which the whole question was reviewed at some length, and certain lines of action suggested with a view to meeting the situation. Exports of groundnut oil cake amounted to 49,512 tons valued at Rs. 30,35,695, of which 35,831 tons valued at Rs. 22,80,174 went to the United Kingdom.

52. *Soap industry*.—Imports of all classes of soap into the Madras Presidency decreased from 2,157 tons valued at Rs. 14.34 lakhs to 1,624 tons valued at Rs. 12.48 lakhs. The fall in the imports of soap may be attributed to the development of the Indian soap industry and the increased number of factories, large and small, that have come into existence.

53. *Fish oil and guano*.—Shoals of sardines did not appear in West Coast waters to any appreciable extent, and certainly not on what may be considered to be a commercial scale. As a result, the major portion of the industry was inactive and prices ruled very high for fish manure and fish guano. This, however, was not the case in respect of sardine fish oil, since the price for this product is governed by low world market prices for other similar products.

54. *Cashewnut industry*.—The year under review saw a marked expansion of the Mangalore cashewnut trade, exports for the calendar year amounting to 60,000 cwt. as compared with 47,000 cwt. in 1933. Prices fluctuated during the year, but were showing an upward tendency at the end of the period under review. There has been a marked increase of competition in the cashewnut trade, and exporters' margins have been small.

55. *Coir*.—The total exports of coir advanced from 620,143 cwt. valued at Rs. 76.55 lakhs to 622,732 cwt. valued at Rs. 79.19 lakhs. The heaviest exports of coir yarn from India are made from Cochin and Travancore States, exports from Calicut covering the smaller production of British India. The bulk of these exports go to Europe, and it will be evident from the figures given that in spite of the adverse trade conditions on the Continent of Europe, the offtake was well maintained. Prices of most of the important Calicut qualities exported, were standing lower at the end than at the commencement of the year under review, for although European countries continued to absorb satisfactory quantities of yarn, the economic conditions prevailing in them affected the price they could afford to pay. The volume of export trade in coir yarn from Cochin was fairly well maintained, but the introduction by Germany and Italy of systems of currency control based upon limitation of imports curtailed exports of coir products from the Malabar Coast to those countries. There was a decline in the demand for coir mats and mattings from Cochin

and Travancore, and prices continued to be depressed by the very strong competition between the exporters.

56. *West Coast timber.*—The position underwent no material alteration during the year, though prices showed a further decline and most of the business was done at extremely cut rates by the smaller suppliers. The demand from Bombay and Karachi for soft wood timbers, white dammar, pali, and mango, was considerably less than in the previous year, as the stocks shipped in 1933-34 were very slow in moving. Shipments of prime rosewood logs to various Continental ports were effected at more or less competitive prices. The southern group of railways were able to place orders for their sleeper requirements at rates lower than at any time during the last three decades and, although the prices at which the sleepers were supplied were unremunerative, the orders helped to keep the industry going.

57. *Tiles.*—The tile industry underwent a slight improvement during the year, and it is hoped that this will continue provided Japanese tiles are not imported into Southern India. There was extremely keen competition for orders, and this resulted in some cases in a lowering of selling prices.

58. *Manures.*—Imports of manures increased from Rs. 21.94 lakhs to Rs. 32.39 lakhs during the year under review, the demand for the principal imported fertilizers, such as, sulphate of ammonia, super-phosphates and muriate and sulphate of potash, showing a considerable increase. Imports of sulphate of ammonia alone amounted to 21,570 tons valued at Rs. 22.33 lakhs, and it may be predicted with some degree of assurance that within the next few years, the consumption of this fertilizer will have increased to 35,000 tons, as within a year or two another 20,000 acres of sugarcane will probably have been brought under cultivation, requiring an additional 8,000 tons of ammonium sulphate. There was continued, if slight, progress in the South Indian manure industry, the increase in the area of tea manured being offset by a decrease in the area of coffee manured due to unfavourable market conditions for the latter crop. Ryots are certainly showing more interest in artificial manures, and during the year an increased quantity was used for tobacco, chillies and other minor crops.

59. *Chemicals.*—The demand for sulphuric acid increased slightly during the year, but prices were rather lower. Imports of Continental acid declined somewhat, but at the end of the year there was the prospect of increased competition as a result of the devaluation of the belga. The demand for hydrochloric acid remained stationary, while the demand for nitric acid declined to some extent. The production of epsom salts continued to benefit from the protection afforded the industry, but green copperas is still being imported in fair quantities, both from England and from Japan, and according to the manufacturers, the present rate of protection is inadequate. Imports under the head 'Chemicals

and Chemical Preparations' increased slightly from Rs. 39.77 lakhs to Rs. 40.31 lakhs. The consumption of heavy chemicals for industrial purposes expanded, there being an increased demand from the textile, tanning and soap industries. Prices ruled firm throughout the year, and were more or less unchanged on balance. The consumption of dyes also increased, and as in the case of chemicals, prices were steady.

60. *Match industry.*—The condition of the industry underwent considerable deterioration during the year. The total consuming capacity of the Presidency and the States of Mysore, Travancore and Cochin, has been estimated at 350,000 gross per month, whilst the total production and arrivals from outside during the latter part of the year are said to have amounted to as much as 440,000 gross a month, the latter figure representing an excess supply of 25 per cent above the actual requirements. Prices fell considerably during the year. The output of matches in India towards the end of the period under review was well ahead of the consuming powers of the country, and unless consumption increases the outlook for the industry is anything but favourable.

61. *Pepper.*—The 'Tellicherry' pepper crop which approximately covers British Indian production was a very heavy one during the season 1934-35, being about 30 per cent above normal. However, this factor was offset to some extent by a short fall in the crop of Alleppey pepper, i.e., pepper from Travancore and Cochin States, as a result of which the total Malabar crop was an average one. The average potential production, however, has increased considerably of late owing to fresh planting. In April 1934, the price of export quality Tellicherry pepper was Rs. 28 per cwt., f.o.b., prices fluctuating until August from which month prices rose steadily to Rs. 39 per cwt. in October owing to the operations of the London pepper pool. When the pool collapsed in January, prices fell heavily to Rs. 26 in March from which low point there was a slight recovery to Rs. 28 at the end of the official year. The offtake of Malabar pepper for Indian consumption has increased during the period under review, with the result that while exports to Europe and America have fallen off, the total movement of pepper from Malabar has been well maintained.

62. *Tea.*—There was an increase in the quantity and value of tea exported during the year from 46.825 million lb. valued at Rs. 399.40 lakhs in 1933-34 to 48.14 million lb. valued at Rs. 425.73 lakhs in the year under review. The results of the scheme for the regulation of exports have not so far fulfilled the expectations of the industry, and stocks in the United Kingdom increased during the year by over 13 million lb. The voluntary scheme which restricts production still continues, and it is hoped that the operations of this scheme will prevent prices in India from falling below a paying level. The present position of the industry serves to emphasize the urgent necessity of exploiting every possible avenue to increase consumption. The propaganda work conducted in Northern India with a view to increasing the

consumption of tea was continued on an intensive scale during the year, and there is evidence to show that the consumption of tea in India is definitely on the increase.

63. *Coffee*.—Exports of coffee declined from 184,686 cwt. valued at Rs. 101.61 lakhs in 1933-34, to 140,579 cwt. valued at Rs. 72.50 lakhs in the year under review. The total exports from Calicut, Tellicherry and Mangalore (which constitute the exporting outlets for East Indian coffee) were about 7,000 tons during the crop season 1934-35, as against 8,000 tons during the preceding season. Owing to the state of affairs in Europe, and especially Germany which is not in a position to take its usual supplies of East India coffee at full prices, the year was a disappointing one from the standpoint of growers, curers, shippers and manufacturers alike. There was a serious reduction in prices of all qualities of East Indian coffee both in the London and South Indian markets. The price of Coorg and Mysore plantation assortment fell steadily to Rs. 37-8-0 per cwt. by the end of March, whilst the nominal quotation for Nilgiri plantation assortment at Coimbatore was then from Rs. 45 to Rs. 48 per cwt. The market closed weak in Coimbatore with an unusually large accumulation of unsold stocks, but these should not be in excess of the requirements of Indian consumption pending the arrival of new crop. There was no abnormal accumulation of stocks in Mangalore at the end of the season. The coffees of the southern districts have not during 1934-35 commanded so large a premium as usual over Coorg and Mysore coffee, owing chiefly to a falling off in the average quality of the former.

64. *Rubber industry*.—Exports of rubber increased from Rs. 18.05 lakhs to Rs. 36.97 lakhs. The main factor which influenced the rubber industry during the period under review was the introduction of a scheme regulating the export of the commodity. The scheme was introduced in June 1934, and India was allotted a quota of 8,850 tons. The average price during 1934 was 6-5/32d. the highest price being 7-5/8d. in August and September, and the lowest 4-3/16d. in January 1935. In spite of increased consumption during the year, world stocks still show an increase. The export quota has since been reduced by 5 per cent and it remains to be seen whether this will have the effect of reducing stocks. The general opinion appears to be that the industry has passed the crucial period, and that from now onwards a steady improvement in the position of world stocks may be expected.

65. *Miscellaneous*.—Exports of sandalwood oil increased from 1,048 gallons valued at Rs. 1.26 lakhs to 3,183 gallons valued at Rs. 3.39 lakhs, Japan being the principal buyer. There was a very large crop of Lemon Grass and exports of the oil increased from 45,416 gallons valued at Rs. 6.30 lakhs, to 77,790 gallons valued at Rs. 11.77 lakhs. Owing to the 1934 drought, the ginger crop was a complete failure, exports were negligible, and the price was forced up from the equivalent of £20 a ton to over £60 a ton

for both bleached and unbleached. Prices were nominal, however, as supplies were virtually non-existent. The demand for turmeric and nuxvomica was moderate, and prices remained steady. The ceramic industry expanded during the year, and although prices fell due to competition with manufacturers in other parts of India, the lower prices stimulated demand. There were no signs of improvement in the aluminium industry, and demand further contracted owing to the competition of low priced brass and copper utensils. The slate manufacturing industry at Markapur and Chittoor expanded during the year, and the importation of foreign slates has decreased on the West Coast.

MANAGEMENT OF MANUFACTURING CONCERNS OWNED BY GOVERNMENT.

66. *Kerala Soap Institute, Calicut—Staff*.—M.R.Ry. A. K. Menon, B.A., continued as Superintendent of the Institute throughout the year.

67. *Production and accounts*.—Trade conditions during the year continued to be unsatisfactory from the standpoint of the soap manufacturer and, despite the favourable level of raw material prices, the margin of profit was small owing to the intensive competition that had to be faced both from the organized factories and the numberless small establishments, some of the latter of which produce soaps of inferior quality at a very low price. The total output declined from 203 tons in 1933-34 to 170 tons in the year under review. There was a corresponding fall in the sales which decreased in value from Rs. 1,69,678 to Rs. 1,38,405-15-6. The result of the year's working was a net profit of Rs. 6,659-6-6. A number of soap factories in this country extend long credit to their customers, a practice which the Kerala Soap Institute, as a Government concern, is unable to follow, and this is a great obstacle to the development of business. Since the commencement of the official year, prices of raw materials have advanced and if the rise continues, it will be difficult for the Institute, unless the turnover is increased, to show a profit on its working during the year 1935-36. Every effort consistent with safe trading will, however, be made to increase the turnover. The accounts were maintained from 1st April 1934 in accordance with the gross budgeting system, monthly accounts being regularly submitted to the Accountant-General, but the commercial system of accounts continues to be maintained also.

68. *Agencies*.—With few exceptions, the volume of business introduced by the agents and stockists, both within and without the Presidency, was unsatisfactory. The West Coast agent did comparatively well during the year in the face of intensive competition, both from foreign and cheap priced locally made soaps. The volume of business introduced by the Colombo agent was also not satisfactory if regard be had to the difficult conditions. The Bombay agents improved slightly on their results of the previous

year, but the sales of the Madras agent were very unsatisfactory, whilst those of the Karachi agent also showed a marked decline. The agencies for the Central Provinces and the United Provinces, and Bengal were terminated owing to the unsatisfactory volume of business forthcoming from them, and the Central Provinces was included in the jurisdiction of Messrs. Raju & Co., Vizagapatam, whilst the United Provinces was added to the territory of Messrs. Fakir Walji and Sons, Karachi. The Rangoon agent transacted only a small business during the year, and efforts will be made to secure a more enterprising agent in this market. At the request of the Bezwada agent, a new soap was placed on the market during the year under the style of 'Kerala Family Soap' which is finding a ready sale owing to its cheapness combined with quality. Two special medicated soaps were made and supplied during the year.

69. *Visits to important markets.*—During the year the Superintendent visited Madras, Bezwada, Bangalore, Hindupur, Anantapur, Bellary, Nandyal, Cuddapah, Salem, Mettur, Cuddalore, Chidambaram, Mayavaram, Kumbakonam, Trichinopoly, Tuticorin, Madura, Kodaikanal, Dindigul, Palni, Mangalore, Udipi and Cannanore. These tours were undertaken with a view to developing the sales of the products of the Institute, but at the same time the indigenous soap factories at these centres were inspected, and the owners advised as to how to improve their methods and products. The visits paid to the various centres yielded much valuable information as to the prevailing market conditions, and without such visits the agents and stockists would tend to become indifferent, and sometimes to push competitive brands.

70. *Training of apprentices.*—Twelve students were under training in the Institute during the year, of whom 10 were from the Madras Presidency and two from Bombay. One student—a London D.Sc., was deputed by the Nagpur University to undergo a short course of instruction. The Institute maintains touch with most of the ex-students who frequently write to the Superintendent for advice or revisit the Institute in order to solve their problems, whilst the Superintendent, during the course of his tours generally makes it a point to visit the old students and to assist them as far as possible.

71. *Laboratory.*—During the year under review, 540 analyses were carried out in the laboratory, of which 415 were of raw materials and soaps in process, and 125 of soaps, oils and other articles received as samples from various sources or collected by the Superintendent during the course of his tours. Certificates of analyses were issued in respect of nine products. The laboratory continued to provide work in the practical testing of oils, fats and soaps for six hours a week for the students undergoing training in the Institute.

72. *Research and experiments.*—The following is a brief summary of the research and experimental work carried out in the Institute during the year:—

(a) *Oil refining.*—The preliminary work in the refining and deodorising of coconut oil in the oil refining plant was completed early in the year, and a standardised product packed in suitable containers has been marketed under the trade name of 'Kokol.' This oil is used mainly by hospitals, clubs and hair oil manufacturers. Refined groundnut oil was tried for canning fish in the local Fisheries Training Institute, in place of imported refined oil, with, it is understood, satisfactory results. As the experiments proceeded, the difficulty of keeping the refined oil in hermetically sealed small containers without impairing the quality of the oil was seriously felt, and the purchase of a vacuum filling and sealing machine was under consideration. In the absence of such a machine, a simple and successful method of removing air from the sealed tins by the use of hot water bath was devised. The laboratory methods of preparing decolorising carbon from paddy husk charcoal were applied on a factory scale, and this bleaching agent was employed in the oil refining experiments carried out during the year. The possibility of preparing and adding vitamin 'D' to the refined oil in order to increase its nutritive value was studied, and the necessary apparatus has since been received from England. The possibility of using refined groundnut oil as a salad oil in the place of imported olive oil was under investigation at the end of the year.

(b) *Cashewnuts.*—Experiments on the preparation of synthetic resin articles with moulding powder prepared from cashew tar had to be put off for want of moulds, dies, and moulding presses. The designing of the cashew roaster was not restarted until shortly before the close of the year. Roasted cashewnut rinds, which are available in large quantities in Mangalore, contain a fair amount of tar, and an insecticidal soap with cashew tar derived from such rinds as a chief base was tested in the Government Cinchona Plantations, Anamalais, for eradicating 'Pink Disease,' with satisfactory results.

(c) *Ginger.*—An examination of foreign samples of ginger—Jamaican, African and Japanese—received from the Indian Trade Commissioner revealed that Indian methods of curing are in advance of either Japanese or African, and that the Indian product is also superior to both. On the other hand, the scraped unbleached ginger of Jamaica is better than Indian ginger to an extent which justifies a premium of 30 per cent on the price. Apart from the superior quality of the raw materials from the botanic standpoint, the improved method of curing practised in

Jamaica seems to be worth experimenting on, and details of the process have been collected. It is understood that some varieties of Jamaican ginger are under experimental cultivation in the Agricultural Research Station, Pattambi, and curing experiments on the basis of the Jamaican method will be conducted during the course of the next crop season. The efforts made by the High Commissioner for India at the instance of this department, to have Indian ginger recognized by the British Pharmacopoeia have been crowned with success.

(d) *Carboga Arisi*.—Studies in the utilization of the resin from this seed were continued, and a slight irritation caused to the skin when the resin was applied to the body was found to be due to the presence of a yellow colouring matter removable by repeated boiling with a dilute solution of sodium carbonate. A lotion prepared from the *Carboga Arisi* extract, and Indian *Hydnocarpus* oil has been found to be somewhat beneficial in cases of leucoderma of the hands and lips and further experiments were in progress at the end of the year.

(e) *Shellac*.—Experiments were conducted on the bleaching of shellac in connexion with the preparation of suitable lacquers for wooden bowls used for packing shaving soap, etc.

73. *General*.—The Institute participated, as usual, in a considerable number of exhibitions, as well as in the Health and Baby Week Celebrations in 31 centres, and secured a number of awards in the shape of gold medals or certificates of merit. The Institute was, as usual, visited during the year by a large number of visitors. A considerable number of inquiries in connexion with the manufacture of soaps, equipment of soap factories, methods of refining oils, blending of vegetable oils and hardened fats to serve as ghee substitutes, and other problems connected with the oil and soap industry were received and dealt with during the year.

TEXTILE SECTION.

74. *Staff*.—Mr. D. M. Amalsad, A.M.C.T., continued as Assistant Director of Industries (Textiles) and Principal of the Government Textile Institute, Madras, throughout the year.

75. *Grant-in-aid by the Government of India for the development of the handloom weaving industry*.—It was mentioned in last year's report that the Government of India had announced their decision to assist, by the grant of a subsidy, schemes drawn up by Local Governments and administrations for developing co-operative buying and selling on behalf of the handloom weavers and generally for the better organization and improvement of the handloom weaving industry. It was decided that the grant per annum should not exceed in the aggregate an amount equal to the proceeds of an import duty of a quarter-anna per pound on yarns

up to 50s imported into the country, and should last so long as the protective measures imposed by the Indian Tariff (Textile Protection) Amendment Act, 1934, continue in force. The scheme prepared by this department received the approval of the Government of India during the year. The amount of grant allotted to this Presidency was Rs. 26,500 for 1934-35 and Rs. 59,500 for 1935-36, and the Government of India have decided that any unspent balances of the grant remaining at the end of a financial year will be again included in the budget for the ensuing year. The grant will be utilized to provide a subsidy to a Provincial Co-operative Society in Madras, which will have an authorized share capital of Rs. 5 lakhs divided into 10,000 shares of Rs. 50 each. A Marketing Officer will be appointed and attached to the Provincial Co-operative Society and, in addition, there will be five marketing agents appointed in suitable centres, each of whom will assist the primary weavers' societies in their jurisdiction in marketing their output. The Marketing Officer will prepare a standard wage list for handloom weavers, regulate the cost of cloths manufactured in primary weavers' societies, and co-ordinate the work of the marketing agents, and also secure forward contracts from wholesale dealers of cloth and pass them on to the marketing agents for execution. A Cloth Designer will be appointed by the Provincial Co-operative Society whose function will be to study the designs and patterns of mill cloths which are in demand, and evolve suitable designs for corresponding types of handloom cloths. Small units of power-driven machinery for preparing and distributing readymade warps for handlooms will also be set up with the object of effecting a very necessary reduction in the manufacturing costs of handloom weavers. A power-driven finishing plant will be installed by the Provincial Society, as it is hoped that better finishing will stimulate the demand for handwoven cloths. Arrangements will also be made to attach a small dyeing factory to the Provincial Society to enable the dyeing of fast colours to be undertaken. At the close of the year, arrangements were in progress to constitute the Madras Handloom Weavers' Provincial Co-operative Society, and to set the organization in motion.

76. *Government Textile Institute*.—The Institute continued to provide the usual courses of instruction—the Supervisor course and the Artisan course, in addition to special courses in certain subjects such as jacquard weaving, dyeing, knitting, and sericulture. During the year, power spinning was included for the first time in the curriculum of the Supervisor course. On the 31st March 1935, there were 95 students undergoing training in the Institute—28 in the first year Supervisor course, 17 in the second year Supervisor course, 28 in the Artisan course, and one in the special sericulture course, whilst 21 mill apprentices underwent training in the power spinning course. The candidates admitted into the Institute hailed from twenty districts in the Presidency, from two other provinces and from two Indian States. With effect from the school year commencing in July 1935,

Government have ordered that a fee of Rs. 50 per month or Rs. 500 for ten months in the year should be levied from candidates from outside the Presidency who are admitted into the Institute.

77. *District work.*—A textile demonstrator was deputed for work in connexion with the Rural Reconstruction Scheme for the Tiruvallur area. Yarn was obtained by him from a merchant in Nagari, and was supplied to select weavers in the area who were assisted in the sale of the cloths produced. The textile demonstrators collected information in regard to the cost of production of important varieties of hand-woven fabrics in weaving centres such as Salem, Pedana, Mangalagiri and Chirala. In connexion with the Tariff Board enquiry in regard to the woollen industry, information as to the cost of manufacture of cumblies, druggets and pile carpets in Ellore, Walajapet, Salem and Kudatini was collected by the demonstrators. Departmental hand-sizing machines were employed during the year at the P. S. G. & Sons Industrial Institute, Peelamedu, the Immaculate Conception Convent Industrial School, Coimbatore, and the London Mission Boys' Industrial School, Erode. During the year, the three posts of demonstrators on Rs. 40—2—50 were abolished, and in their stead a post of Textile Inspector on Rs. 70—7½/2—100—10/2—150, was sanctioned temporarily for a period of five years, for the purpose of rendering practical assistance to aided textile schools, as also to capitalists in the districts in weaving, dyeing and knitting, including the erection of machinery.

78. *Aided Textile Schools.*—The aided schools devoted to textiles continued to be under the supervision of the Assistant Director of Industries (Textiles). In last year's report reference was made to a revised system of awarding maintenance grants to recognised industrial schools under which maintenance grant to an industrial school is determined by the financial position of the school, the cost of the teaching staff actually employed, and the number of pupils of the prescribed age limit and general educational qualifications who receive instruction in the school. This scheme was brought into force during the year under report. A standard syllabus for dress-making and embroidery was drawn up in consultation with the leading needle craft schools, and the correspondents of all schools imparting training in these subjects were requested to adopt the syllabus. An amount of Rs. 16,824 was sanctioned as maintenance grants to textile schools, whilst a sum of Rs. 1,212 was sanctioned as capitation grant. Equipment grants were sanctioned to the amount of Rs. 768-1-0.

79. *Research work.*—Extra border designs with gold lace and silver lametta are at present woven by a complicated system of lever arrangement or on the drawboy system, and a small jacquard machine of 32 hooks for simplifying the production of these designs was constructed. A cheap cottage loom of a special type, and a vertical warping mill suitable for preparing short warps for part-time weaving were also constructed. With a view to reducing the cost of production of raw silk, a domestic foot silk

reeling machine with four reels was designed. Improvements were also made in the silk twisting machine constructed last year, and it has been provided with 24 spindles.

80. *Assistance to jails.*—As in previous years, visits to the textile manufacturing sections of the jails and the provision of technical advice in regard to their working formed part of the work of the textile branch. During the year under report, the Assistant Director of Industries (Textiles) visited the Bellary and Coimbatore Central Jails. The question of the new layout for the wool spinning plant, as also of the electric motors for driving the plant in the Bellary Jail, was settled during the year. The Assistant Director also served on the committee for the purchase of raw cotton for the manufacturing section of the Central Jail, Coimbatore.

81. *Short reeling of cotton yarn.*—The handloom weavers in this Presidency obtain their supply of cotton yarn largely from Indian mills, some of which apply false trade descriptions to the bundles of cotton yarn sold to the handloom weavers. The practice of short reeling of skeins, or of reducing the length contained in a hank, and the substitution of yarn of a coarser count than that marked on the bundle is also carried on by some of the mills at the request of the yarn merchants. Such fraudulent practices carried on with the knowledge of the mills render them liable to prosecution under section 6 of the Indian Merchandise Marks Act of 1889, whilst section 7 of the Act applies to yarn merchants who sell, expose, or have in possession for sale or for any purpose of trade or manufacture, short-reeled yarns, the counts of which are not as indicated on the bundles. A Press Communiqué was issued during the year warning dealers in yarn that they should take necessary steps to see that the correct count is marked on the label of each bundle before yarn is sold to handloom weavers. Copies of the communiqué were forwarded to the principal yarn merchants in Madras.

82. *Gold-thread industry.*—The Assistant Director of Industries (Textiles) visited Bombay and Surat in December and January, and investigated the conditions under which the gold-thread manufacturing industry is carried on there. The industry is extensively carried on as a cottage industry in Surat, the processes involved giving employment to different sets of workers from the silver-smelter to the gilder. Since the imposition of the higher import duty, the requirements of gold-thread of the handloom weavers in South India have been met largely by Surat manufacturers, and it is very desirable that efforts should be made to introduce the manufacture of gold-thread as a cottage industry in this Presidency. Accordingly, proposals were submitted to Government for carrying out certain preliminary work in regard to the stages subsequent to wire drawing with a view to improving upon the present methods. Government, however, ordered that the proposals should be brought forward as a Part II Scheme for 1936-37.

83. *Application for protection by the woollen industry.*—In connexion with the Tariff Board enquiry, a report was drawn up in regard to the woollen industry of the Presidency. As the woollen goods manufacturing industry of the Madras Presidency is more or less restricted to the production on handlooms of cumblies, pile carpets and druggets, it is not directly affected by such classes of woollen goods as are imported into Madras. The carpets imported from foreign countries are generally machine made and are of a different class, and do not therefore compete directly with woollen carpets made on handlooms. As regards piecegoods, superior woollen yarns are not available for the manufacture of these goods, and they are not therefore manufactured in the Presidency. In the circumstances, it was suggested that the assistance needed for the development of the woollen industry of the province lay in the direction of affording local facilities such as adequate pastures for the raising of a more vigorous stock of sheep for augmenting the supply of raw wool, by the importation of foreign rams, preventing the admixture of cut and dead wool, an agency for collecting and sorting raw wool, granting of loans for the setting up of wool spinning plants for the production of even yarns, and organization of co-operative societies among the wool-workers and marketing of the output.

SERICULTURE.

84. Mr. K. T. Achaya continued as Sericultural Expert throughout the year. The Sericultural Expert toured for 115 days and visited all the important silk centres in the Presidency.

85. *Government of India grant for the production and distribution of disease-free cellular seed and for research.*—In accordance with the announcement during the discussion of the Indian Tariff (Textile Protection) Amendment Bill in the Legislative Assembly of their decision to assist the sericultural industry, the Government of India decided to distribute annually for five years sericultural grants aggregating Rs. 1 lakh a year for expenditure between 1st April 1935 and 31st March 1940 for the benefit of the industry in British India. It was decided subsequently that the amount to be provided by the Government of India should not be dissipated on a number of unconnected experiments, but devoted principally to the increased production of disease-free 'cellular' seed, and such research as might be possible in connexion therewith. Accordingly a scheme was drawn up for the consideration of the Government of India for the production and distribution of 'cellular' seed, and for the conduct of research on silk worm diseases. The scheme was scrutinized and recommended by the Imperial Sericultural Committee, and the Government of India, accepting the recommendation of the Committee, sanctioned the payment, during 1935-36, of a sum of Rs. 2,260 for research on pebrine disease, and Rs. 14,350 for the scheme for the supply of cellular seed. The scheme will be given effect to from 1st August 1935.

86. *Peripatetic Rearing Party.*—The decentralization of the Peripatetic Rearing Party so as to admit of the posting of the rearer and five moth testors to six centrally situated villages in the Kollegal sericultural area, to which reference was made in the report of the previous year, continued to work satisfactorily, the number of layings tested by the Party increasing further from 843,000 in the previous year to 961,588 in the period under review. Most of the sericultural villages in the Kollegal taluk are now using the tested layings and are satisfied with the results, rearers who formerly used pebrinized seeds having been convinced of the advantages of using disease-free seed. In last year's report it was mentioned that Government had approved a proposal that, with a view to supplying disease-free seed to the Kollegal silk worm rearers, and also to maintaining the vitality of the worms, the department should purchase seed cocoons which are produced in localities other than Kollegal to the extent of 15 lakhs, convert them into disease-free layings by the Peripatetic Rearing Party, and sell them to the Kollegal rearers at the rate of Re. 1 per thousand seed cocoons. Owing to the scarcity of rain, the total rainfall during the year being only 24.22 inches as against an average annual rainfall of 31.42 inches, the full amount of the grant could not be utilized during the period under review. 707,250 seed cocoons were purchased for Rs. 613-3-3, and 205,927 disease-free layings were obtained and sold, an amount of Rs. 739-9-2 was realized from the sale of disease-free layings and pierced cocoons, the operations thus yielding a profit of Rs. 126-5-11. The Moth Testors and the Silk Superintendent inspected periodically the rearings conducted by the village rearers out of the layings supplied by the department.

87. *Silk Farm, Coonoor.*—Hybridization work was continued at this farm during the year, and one crop of univoltine worms from seed obtained from Kashmir, two crops of hybrid layings (cross between the Japanese and Mysore), and four crops of eri worms were successfully reared during the year. 21,500 univoltine cocoons and 205 hybrid layings were supplied from this farm to Kollegal. A number of mulberry grafting and budding experiments with a few Japanese varieties of buds and grafts were undertaken at the Coonoor Farm on the Indian bush variety and the budded and grafted plants have come up very well. Subsequently, more grafts and buds were sent from the Government Textile Institute, Madras, and these plants which are free from fungus are giving healthy and succulent leaves, rich in nutrition for rearing the hybrid worms. Cross polination was also attempted, and this experiment is still in progress.

88. *Silk Farm, Hosur.*—The leased mulberry garden farm at Chinnabelugondapalli was given up, and 13 acres of land taken over from the Agricultural Cattle Farm in July, was planted with cuttings in October. Owing to the drought conditions which prevailed after the planting, the garden was irrigated from water taken from the tank. Except over an area of 2½ acres,

the cuttings germinated uniformly. As the land was full of nut grass which hampered the growth of mulberry, weeding had to be systematically carried out. Eight small rearings were conducted with 200 pure Mysore and 260 hybrid layings with the leaves available from the small mulberry garden round about the farm, harvesting 185½ lb. of cocoons (81,267 cocoons) out of which 76 lb. of cocoons counting 29,657 were sent to the Silk Superintendent, Kollegal, for seeds. 68½ lb. counting 30,670 cocoons were converted at the Farm into 10,135 layings and then sent to Kollegal, whilst the balance were reeled at the Farm. The disease-free layings distributed have given satisfactory results, and there is always a ready demand for Hosur seed.

89. *Silk Farm, Palmaner*.—Six rearings were conducted with 570 layings of pure Mysore worms which yielded 158 lb. of cocoons counting 99,590. Out of these, 94,765 seed cocoons were supplied to Kollegal for distribution, and the rest were reeled. The operations of the Farm suffered owing to the scanty rainfall.

90. *Tadaguni Farm*.—Six rearings of pure Mysore worms and four rearings of hybrid worms were successfully reared during the year with 2,276 layings of seed harvesting 876 lb. of cocoons. The number of disease-free layings distributed was 36,248, the balance of the cocoons being converted into silk. This farm has served as a seed farm as well as a demonstration farm with satisfactory results.

91. *Hybridization with Japanese seed*.—Hybridization work with the original Japanese hybrid seed brought by the Sericultural Expert from Japan was carried on at the Farms at Coonoor, Hosur and Thadaguni, and these hybrids have successfully passed their seventh generation. 12,924 layings of hybrid seeds were distributed in Kollegal taluk, and these layings have given uniformly good results. The number of green cocoons per pound has been 470 in Thadaguni, 410 in Coonoor, and 405 in Hosur. The supply of Japanese hybrid seed, an indent for which was sent through the Japanese Consul, Bombay, had not been received by the end of the year.

92. *District Sericultural work*.—The five assistant demonstrators of sericulture were stationed at (i) Kuppam, (ii) Penukonda, (iii) Ellore, (iv) Mangalagiri, and (v) Vadakangulam. At Vadakangulam, the sericultural work continued to progress satisfactorily, and there are now 15 acres under mulberry. 2,709 layings were supplied to Kollegal and 1,200 layings were used in the area itself. Mr. Ponnu Pillai of Palamcottah has planted 5 acres of mulberry and raised a successful crop of cocoons. A rearer from Hosur supplied 20,000 seed cocoons to Kollegal, and these were converted into disease-free layings and successfully distributed. In other centres, more ericulture than sericulture work was done, owing to the absence of timely rains for planting mulberry. The Sericultural branch participated in a number of exhibitions and conferences, where demonstrations of silk and eri worm rearings were conducted for the benefit of the agriculturists.

93. *Improved Japanese cottage machines*.—The Japanese reeling and re-reeling machines brought from Japan by the Sericultural Expert were given extended trials during the year, and it was found that a pound of silk could be reeled in the Japanese cottage machine and then re-reeled at a cost of Rs. 5-10-0. As there were only two reels, the production of silk reeled per day was small, and arrangements were therefore made, for the construction, at the Government Textile Institute, Madras, of a machine with four reels, and this was sent to Kollegal for trial. It is expected that this improved machine will enable the cost of production to be appreciably reduced. The silk reeled on this machine has been very favourably received by the weavers. As there were only twelve spindles on the Japanese twisting machine, the production was found to be unduly low though the principle involved in twisting was sound. A machine with twenty-four spindles is therefore being constructed, and it is hoped that this will solve the problem of outturn.

94. *Green manure experiments*.—The prevailing drought conditions were not favourable for the carrying on of these experiments which were started in the mulberry fields of private rearers last year. But the leased mulberry lands at Thadaguni were utilized for the purpose, sunn hemp being inter-cultivated with mulberry. It is too early to arrive at any conclusion in regard to these experiments as there was delay in the decomposition of the sunn hemp owing to the lateness of the rains.

95. *Manurial experiments*.—A number of manurial experiments were conducted at the Hosur and Coonoor Farms with varying proportions of sulphate of ammonia, pungam cakes, and farmyard manure, and the results as far as they go indicate that sulphate of ammonia and farmyard manure mixed in the ratio of 1 : 8, yields the best results—that is, the maximum growth of leaves which appear to be disease-resisting. Further experiments were in progress at the end of the year. The Imperial Chemical Industries (India), Limited, Madras, supplied the department, free of charge, with 330 lb. of sulphate of ammonia and 300 lb. of Nicifos 22/18—a compound fertilizer containing nitrogen and phosphoric acid—and these fertilizers were applied according to the instructions given by the Company. The best results were obtained by adding to 10 cartloads of farmyard manure, 20 lb. of sulphate of ammonia and 200 lb. of Nicifos 22/18 per 80 cents of land, a yield of 670 lb. of leaves per picking being obtained, as against 478 lb. when farmyard manure alone was applied. These experiments were still in progress at the end of the year.

96. *Silk worm guts*.—Sample guts were prepared from Mysore hybrid and univoltine ripe worms and sent to the General Hospital, Madras, for test. If favourable reports are received from the medical authorities, it is hoped that a new and profitable side industry will be opened up. The department is working in close touch with Mr. A. H. Whittle, of the Surrey Estate, Gudalur, Nilgiris, who is taking a keen interest in the matter.

97. *Market conditions.*—Prices of raw silk and cocoons remained at a very low level during the year, and the silk worm rearers of Kollegal suffered severely from the low prices prevailing and the severe competition experienced from Japanese and Kashmir silks in the Madras market. Despite the levy of a specific duty of 14 annas per lb. on raw silk over and above the existing duty of 25 per cent *ad valorem*, prices of Chinese silks showed no advance on the values ruling before this measure of protection came into force. From August onwards a considerable amount of distress filature Japanese silks were brought into the Madras market, and sold at the prices ruling for Chinese silks though the qualities were infinitely superior. Further, Kashmir filature silk also entered the market at prices ranging from Rs. 3-13-0 to Rs. 4-1-0 per lb., the same as those ruling for Japanese silk. Kashmir filature silks are proving very popular in all the weaving centres of the Presidency on account of their evenness and low price.

98. *Eri-culture.*—During the year demonstrations of eri-silk worm rearing were successfully carried out in a number of new centres, including Mangalagiri in Guntur district, Tiruvallur in Chingleput district, and Pudupet and the villages around it in North Arcot district. Eleven rearings were successfully conducted at Kuppam during the year, and 30 lb. 2 oz. of pierced cocoons and 49 oz. of seed were produced. The demand for seed was constant at all seasons of the year and as many as 13 centres were supplied with eri seed from Kuppam. The Coonoor Farm also supplied several centres with eri worm seeds. In the absence of a market which has yet to be created for cocoons as such, persons who have resorted to ericulture are being advised to convert their cocoons into yarn for weaving. It was mentioned in last year's report that a consignment of eri cocoons had been sent to Messrs. Lister & Co., Ltd., of Bradford, for conversion into different counts of yarn. These experiments, on the results of which the future of ericulture largely depends, were still in progress at the close of the year, and a further consignment of 75 lb. of eri cocoons have at the firm's request, been despatched to them. It is understood that the Mysore Government proposes to set up a silk-waste spinning plant, and if this materializes, it is possible that an outlet for the eri cocoons produced in Madras may be found in the Mysore factory. The question of setting up a plant for the manufacture of spun silk from silk-waste in the Madras Presidency has also received some attention, but it is doubtful whether under present conditions, there is room for two such factories in South India.

ENGINEERING SECTION.

99. *General.*—The work of the engineering section consists mainly of the conduct of boring and pumping operations, the systematic inspection and maintenance under the compounding fee system of pumping installations and industrial machinery already at work, the purchase, erection and maintenance of pumping plants suitable for irrigation, as well as of industrial

machinery, the investigation of applications for loans under the Land Improvement Loans Act and of certain applications under the State Aid to Industries Act.

100. *Staff.*—Mr. L. S. Pinto held the appointment of Industrial Engineer throughout the year, except for a period of two months from 12th June to 11th August 1934, when M.R.Ry. N. M. Adyanthaya, Principal, Government School of Technology, Madras, acted for him. The Industrial Engineer was assisted by four Assistant Industrial Engineers, one in charge of the Industrial Engineering Workshops, Madras, and one each in charge of the Bezwada, Tanjore and Coimbatore divisions, the Industrial Engineer holding direct charge of the Madras subdivision, comprising the districts of Madras and Chingleput.

101. *Boring.*—The main work of the Engineering section is boring for water. The department maintained nineteen power drills (two Keystone, three Calyx and fourteen Armstrong), one air compressor drill, and 106 hand-boring sets. The Keystone and Calyx drills are very old and the cost of maintaining the machines in commission is disproportionate to the results obtained from them. Proposals have therefore been submitted to Government that these drills should be withdrawn and disposed of by public auction or otherwise scrapped. The following table exhibits the territorial distribution of the applications received for boring, the number of feet bored in each of the divisions, and other relevant particulars:—

Division.		Applications pending on 1st April 1934.	Applications received during 1934-35.	Applications disposed of during the year.	Applications pending on 1st April 1935.	Total number of feet bored.		Number of borings put down.	Number of successful borings.
						FT.	IN.		
Bezwada	.. ..	63	273	245	91	27,375	5	389	318
Coimbatore	.. ..	23	164	137	50	12,457	0	320	135
Tanjore	.. ..	16	133	122	27	16,999	0	348	253
Madras	.. ..	8	56	59	5	6,682	3	118	63
Total	.. ..	110	626	563	173	63,513	8	1,175	769

It will be seen that the total number of borings put down and the depth bored during the year were 1,175 and 63,513 feet 8 inches, respectively, as against 1,047 and 62,309 feet, respectively, in the previous year. The increase is due to the continued efforts put forth during the year to obtain maximum results from the operations of the plants. The amount expended by the public on the boring operation conducted is estimated to be not less than Rs. 2,15,500. Of the 769 successful borings put down, those for agricultural purposes numbered 390. Assuming that the average

yield per borehole is 50 gallons per minute, the total quantity of underground water made available for irrigation purposes from these boreholes works out to 19,500 gallons per minute, and assuming further that only a third of the supply tapped will be utilized, the borings put down during the year for agricultural purposes may be expected to maintain 1,733 acres of land under irrigation. The demand for boring was very great, but many applications for drinking water-supply were rejected as under the orders in force borings for tapping drinking water-supplies had to be restricted to rural water-supply schemes for the public. Towards the end of the year under review, Government relaxed these restrictions, and permitted departmental plants to be hired out for water-supply schemes for individuals on the West Coast, in the Ceded districts, and in places where a good case can be stated for the improvement of a defective water-supply, when all other applications higher in the order of preference have been complied with. Government also issued orders, sanctioning a general revision of the rules for the levy of fees for work done by the District Engineering Branch.

102. *Artesian borings.*—At the close of the year, the department had to its credit 71 artesian boreholes. During the year under review, twelve artesian springs were tapped. Of these, nine were in the Bezvada division, discharging fresh water at rates varying from 9 to 275 gallons per minute at ground level, the height of discharge ranging from 2 to 3 feet above ground level, and three in the Tanjore division of which two are brackish springs and the third one discharges fresh water, at 200 gallons per minute at $2\frac{1}{2}$ feet above ground level. As a result of the tapping of these springs, the value of the lands benefited thereby has increased considerably. Most of the borings were utilized to increase the area under cultivation.

103. *Sub-artesian borings.*—The greatest depth of boring completed during the year by a hand boring set was 442 feet in the East Godavari district, and by a power drill 1,003 feet at Bobbili, the latter being the deepest boring ever put down by a departmental power drill. At the instance of the District Board, Tanjore, a few borings were put down in the Vedaranyam area for the use of the public during the Ardhodayam festival in February 1935. Several borings were put down for the Srirangam Municipality and good springs, each yielding about 100 gallons of water per minute were met with. On one of these boreholes the municipality have installed a $2\frac{1}{2}$ -inch centrifugal pump driven by an electric motor. This pump discharges directly into the mains about 80 gallons of water per minute at a pressure of 50 lb. The distribution of water is made within the municipal area at 75 taps. Two borings were put down for Mr. A. Sriramulu at Pedavegi, Ellore taluk, West Godavari district, in a well 60 feet deep up to 93 feet and 100 feet below ground level. There was no water in the well before boring, but as a result of the boring,

20 feet of water became available in the well. The applicant is now irrigating 6 acres of garden land with the supply and expects to derive an annual income of Rs. 400 thereby. Two 4-inch borings to a depth of 55 feet below ground level were put down for Mr. G. Punnayya at Peddapulipakka, Bezvada taluk, in an existing well, 32 feet deep and 16 feet diameter. Before boring, the well was supplying water for a mhote for four hours a day, but after boring, the well supplies water for two mhotes continuously day and night. The well commands 6 to 8 acres of turmeric crop, and an income of Rs. 1,000 to Rs. 1,200 per annum is expected to be derived from it. A successful boring was put down for Mr. G. Tirupati Reddi of Gollamacherla, Sattenapalle taluk, and carried down to 43 feet below ground level in an existing well. A mhote has been installed, and the supply is being utilized for irrigating one acre of garden land from which an annual income of Rs. 300 is expected. A successful 6-inch boring was put down for Mr. N. Peddaveerappa Chetti at Gokuladinne, Koilkuntla taluk, Kurnool district, to $38\frac{1}{2}$ feet below ground level. Before boring, the well was supplying a mhote for three hours once in three days, but now the well supplies water continuously for a mhote. It is proposed to instal a pumping plant and irrigate about 6 acres of orange garden from which an annual income of Rs. 1,500 is expected to be derived.

104. *Rural Development Scheme, Tiruvallur, Chingleput district.*—The hand-boring set, which was placed at the disposal of the Rural Development Committee free of hire charges continued to work till the middle of December 1934. During this period, two borings were put down, one for the Velliyur Panchayat Board, and the other for the Karikalavakkam Panchayat Board.

105. *Work of the Power Drills.*—Considerations of space will admit only of the briefest possible reference to the work of the power drills, and only a few important examples of the power boring operations conducted during the year can be given: An old type Keystone drill was engaged by Messrs. K. Hajee Muhammad Oomer Sahib and J. Hajee Abdul Kareem Sahib & Co., Tanners, Meenambakkam, Saidapet taluk, Chingleput district, and a boring 8 inches in diameter was taken down to 320 feet below ground level mostly through rocky strata, a good spring yielding a continuous supply of 50 gallons per minute at 30 feet below ground level being tapped. The difficulty in obtaining adequate water-supply for the tannery was overcome, and the hirer arranged to sink a well and instal a power pump. The expenditure incurred by the hirer was about Rs. 2,500, and the income of the tannery is likely to be increased by about Rs. 2,000 a year. Another Keystone drill was employed on work for the Central Jail, Trichinopoly. The boring, which was commenced during the previous year, was taken down to 80 feet 7 inches in hard rocky strata and was completed in May 1934, a spring being tapped which gave a discharge of four gallons per minute. On completion of this work, the drill was engaged by the Zamindar of

Rettiambodi, Thachanandal, Melur taluk, Madura district, for whom a ground boring was put down to a depth of 160 feet in his garden at Thachanandal, mostly in rocky strata. A spring was tapped, yielding a supply of eight gallons per minute. The zamindar has spent about Rs. 1,000 on the boring, and he intends to bring under cultivation 4 acres of land in addition to the 4 acres already under sugarcane. By this increased supply, his annual income is likely to amount to Rs. 400. One of the Armstrong drills was engaged throughout the year for the Loyal Mills, Limited, Koilpatti, Tinnevely district, with the object of enhancing the water-supply to the mills. The 8-inch boring put down during the previous year was taken down to 350 feet below ground level in white rocky strata. The bore was enlarged from 8 inches to 10 inches up to 100 feet and lined with 8-inch pipes to prevent silting. An electric motor and pump have been installed on this bore, which has been found to yield 25 gallons of water per minute, the water level being 24 feet below ground level. During the unprecedented drought last year, when all the wells in the neighbourhood had gone dry, this bore saved the situation for the mills, which otherwise, would have had to be shut down for over two months for want of water. Another Armstrong drill was engaged by the Mangalore Municipality at Bolar for a short time at the beginning of the year, and the 6-inch ground boring put down in the previous year was taken down to 250 feet below ground level, the bore yielding a supply of 15 gallons per minute. A boring was then put down for the St. Joseph's Asylum Orphanage, the boring went down to 373 feet below ground level and two good springs were tapped, one at 240 feet and another at 364 feet below ground level. An air lift pump with a 5 B.H.P. motor is now worked daily for three or four hours and the borehole supplies 1,000 gallons per hour. An Armstrong drill was engaged throughout the year for the Andhra University at Waltair, and the boring which was in progress at the beginning of the year was continued from 95 feet to 133 feet below ground level. Further work was stopped as tools got stuck in the borehole. A second boring was then conducted for the University to a depth of 141 feet below ground level, and a spring was tapped which yields a supply of 28 gallons per minute. The borehole is lined with departmental pipes, and arrangements are in progress to get a deep well pump driven by an electric motor to deliver 25 gallons of water into an overhead tank 130 feet above ground level. A third boring was put down for the University to a depth of 148 feet below ground level, and a fourth boring to a depth of 138 feet below ground level and these borings are still in progress. The total expenditure so far incurred by the University on borings, pipes, overhead tank, pumping machinery, etc., is reported to be about Rs. 18,300. There is a proposal to connect the four boreholes through a 4-inch main to an overhead reinforced concrete tank of 8,000 gallons capacity. An Armstrong drill was employed to put down a boring for the Zamindar of Kirlampudi at Bobbili, and it was

carried to a depth of 1,003 feet below ground level, this being the deepest boring ever put down by a departmental power drill. Water level stood at 17 feet below ground level, but the discharge is eight gallons per minute at 250 feet below ground level. Two blastings were conducted in this borehole, one at 600 feet and the other at 450 feet below ground level, but there was no increase of yield after blastings. The zamindar has expended Rs. 5,000 on this boring, and he intends installing a power pump on the borehole for irrigating garden crops raised over an area of five acres, and expects to derive an income of Rs. 300 a year. Another Armstrong drill continued to work for the Coimbatore Cement Company, Limited, at Madukarai, until June, to complete the boring started in the previous year. The second boring put down for the Company was taken down to 335 feet below ground level, and the bore was also blasted with a heavy charge of 250 lb. of gelignite. This borehole which was then cleaned by the departmental air compressor drill, yielded 3,500 gallons of water per hour. The drill was then shifted to the Central Jail, Coimbatore, where a ground boring was put down to 138½ feet below ground level, which yielded a supply of 4 gallons of water per minute, when tested by the kite motion pump.

106. *Torpedoing operation.*—There were at the beginning of the year, seven applications pending, 24 were received and 25 applications were disposed of during the year.

107. *Pumping sets.*—The department maintains a number of pumping plants for hiring out to ryots to pump water to their crops during periods of drought, or for well-sinking. The number of plants so maintained during the year was 33. Proposals have been submitted to Government for the scrapping of ten plants which have become unserviceable. The number of applications pending at the beginning of the year was ten, 92 were received, and 95 applications were disposed of during the year. One pumping set was utilized during the Ardhodayam festival for pumping out water from a well for the use of over one lakh of pilgrims who visited the shrine, and who would otherwise have suffered considerably for want of good drinking water. Three sets were working at the Central Jail, Trichinopoly, continuously pumping out water from wells for the use of about 1,000 prisoners in the Jail.

108. *New investigations.*—During the year under review, advice was given to Government departments, and the public on a variety of engineering problems. There were at the beginning of the year twelve applications for information and advice on hand, 177 were received and 164 applications were disposed of during the year.

109. *Assistance to agriculturists and industrialists—New erections.*—The department undertakes the erection of machinery and plant on payment of a nominal fee on the capital cost of machinery

installed. The number of plants erected during the year was as follows:—

Division.	Pending on 1st April 1934.	Received during the year.	Disposed of during the year.	Pending on 1st April 1935.	Remarks.
Bezwada	4	25	20	9	Seventeen pumping and three industrial plants.
Coimbatore	4	14	15	3	Nine pumping and six industrial plants.
Tanjore	2	10	10	2	One pumping and nine industrial plants.
Madras	..	1	1	..	One industrial plant.
Total	10	50	46	14	

The capital invested in the above plants, including the cost of the buildings amounted to Rs. 93,520. It may be of interest to record the horse-power of the largest and the smallest plants erected during the year in each division:—

Division.	Largest plant. B.H.P.	Smallest plant. B.H.P.
Bezwada	55	3
Coimbatore	28	3
Tanjore	50	31

The acreage brought under cultivation and the probable enhanced income accruing therefrom as a result of the pumping plants erected by the department during the year under review are shown below:—

Division.	Acreage brought under cultivation.	Probable enhanced income accruing therefrom. RS.
Bezwada	501	5,300
Coimbatore	15	3,000

In some cases, erections done by private agencies were found to be defective by the owners of the plants, and they were re-erected by the department.

110. *Compounding system.*—Under this system, owners of private installations are entitled to have their plants inspected and overhauled three times a year on payment of a small fixed fee per annum, and also at other times if special requisitions are received, for which, however, a small additional fee is charged. The number of plants compounded during the year under review was 502, as against 522 in 1933–34. The following statement shows the number of plants under maintenance in the four divisions:—

Division.	Industrial plants.	Pumping plants.	Combined plants.	Electrical plants.	Total.
Bezwada	58	57	4	..	119
Coimbatore	45	84	10	..	139
Tanjore	109	52	11	28	200
Madras	13	30	1	..	44
Total	225	223	26	28	502

The total capital cost of the above installations is estimated at Rs. 26,04,000.

The largest and the smallest plant compounded in the divisions were as follows:—

Division.	Largest size of plant. B.H.P.	Smallest size of plant. B.H.P.	Total approximate horse power compounded.
Bezwada	65	4	2,274
Coimbatore	70	1 1/2	208
Tanjore	200	1 1/2	4,220
Madras	60	5	753

111. *Sugarcane-crushing mills.*—The department is in possession of nine power-driven sugarcane crushing mills, three with engines and six without engines, which are hired out to the public for crushing their cane. There was a heavy demand during the year for the use of these mills by the sugarcane growers and all the departmental mills, with engines attached to each, were engaged during the crushing season. One set was lent to the Agricultural Research Station, Anakapalle, the total quantity of cane crushed being 150 tons. Another set was lent to the Khilladar of Bobbili Samastanam and the quantity of cane crushed in this case was 190 tons. The same set was sent later to Mr. Sajjupalli Sriramulu of Regidi, Palkonda taluk, Vizagapatam district, and it crushed about 41 tons of cane. Another set was hired out to the President, Eletipalem Co-operative Society, Repalle taluk, Guntur district, and crushed 440 tons of cane, the juice being converted into jaggery. Another set was hired out to Mr. Kakani Venkataratnam at Akumur, Gannavaram taluk, Kistna district, and 300 tons of cane were crushed and the juice converted into jaggery. The same set was lent to the President, Chineraparupudi Co-operative Society, Gudivada taluk, and it crushed 350 tons of cane. Another set was lent to the Zamindar of Ullipalavam, Guntur district, and crushed 575 tons of cane. The Peddamaddula Co-operative Society, Gudivada taluk, engaged another set, and about 400 tons of cane were crushed. A mill, without engine, was lent to the Chellapalli Co-operative and Industrial Credit Society, and by the end of the year had crushed 1,440 tons of cane. Other sets or mills without engines were hired out to the Zamindar of Rachur, Guntur district, Mr. N. Durga Nageswara Rao, Siddantam, Gudivada taluk, Mr. Anantarama Ayvar of Sangramanallur, Kolumam, and Mr. Ramachandra Reddi of Kattuvapuralli, North Arcot district.

112. *Sugar manufacture.*—The department is in possession of two sugar centrifugals, and demonstrations with these plants were carried out in different places. Mr. Muthulinga Reddivar of Chingleput district undertook the preparation of rab and the manufacture of sugar under the supervision of a departmental mechanic, and a good quality sugar was obtained. The working of a departmental sugar centrifugal was demonstrated at a show held at the Agricultural Research Station, Aduturai. The

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demonstration of the manufacture of "Boora sugar" by the indigenous method was taken up during the year under review, as the process appeared to offer possibilities for the manufacture of white sugar on a small scale by individual cane growers. Mr. K. Sundaram Chettiyar of Vanatharajapuram, who had grown eight acres of cane in his village, placed at the disposal of the department a portion of his canes for demonstration, and a departmental sugarcane mill was deputed for crushing. Preliminary arrangements were also in progress during the year for the demonstration of the manufacture of white sugar from palmyra juice in the Tinnevely district.

113. *Services rendered to Co-operative Societies.*—Assistance was rendered by the department to several co-operative societies on a variety of engineering matters. Hand-boring sets were hired out to the Vuyyuru Co-operative and Industrial Credit Society for testing soils in connexion with the construction of the factory buildings, for foundation purposes, and for putting down a deep boring for the supply of water to the factory. The plants of the Kallakurichi, Sankarapuram, Rishibandan, and Nangavaram Co-operative Societies in the Tanjore division were under departmental supervision during the year.

114. *Services rendered to departments of Government.*—During the year under review, the value of services rendered to the Agricultural, Revenue, Public Works, Jail, Forest, Educational, Medical, Fisheries, Labour, Excise, Judicial, Health, Electricity and Registration departments in the various divisions, amounted to Rs. 12,405-10-10, as shown below, as against Rs. 11,519-6-11 in 1933-34:—

Divisions.	Value of services rendered.		
	RS.	A.	P.
Bezwada	5,657	1	10
Coimbatore	2,765	9	0
Tanjore	3,642	0	0
Madras	341	0	0
Total	12,405	10	10

115. *Loans for the purchase of pumping plants.*—Loans are granted only in cases where there is a reasonable prospect that by means of such loans the lands of the ryot will be improved and his income increased. During the year under review, 31 applications were disposed of, of which 30 were either withdrawn or rejected, and one loan of Rs. 3,000, from the Coimbatore division, was sanctioned. The amount actually disbursed during the year was Rs. 3,500.

116. *Industrial Engineering Workshops.*—The total value of work orders executed in the workshop for various departments, and for private persons during the year under review is shown below:—

Details of work done under different heads.	Amount realized.					
	1934-35.			1933-34.		
	RS.	A.	P.	RS.	A.	P.
I Pumping and boring	56,970	0	0	70,541	7	6
II Inter-departmental	253	0	0	158	2	0
III Other Government departments	998	0	0	125	0	0
IV Private parties	1,063	0	0	993	8	0
V Workshop maintenance	..	..	..	4,904	6	0
Total	59,284	0	0	76,722	7	6

The working of the concern during the year resulted in a net loss of Rs. 13,760-0-2, including Rs. 4,953 written off as loss on the disposal of surplus stores relating to the year 1932-33. This compares with a loss of Rs. 10,287-14-11 in 1933-34. The personal ledger account system was given up from the beginning of the year, and the gross budgeting system was introduced in its stead, but the commercial system of accounts continues to be maintained also with a view to ascertaining the result of the working of the concern on a commercial basis.

INDUSTRIAL EDUCATION.

117. Mr. W. Fyfe rejoined the post of Inspector of Industrial Schools on 3rd April 1934 on reversion from the post of Chief Inspector of Factories which he had held temporarily. He continued as Inspector of Industrial Schools until the end of the year, except for the period from 7th November 1934 to 20th January 1935 during which he acted as Deputy Director of Industries, and Mr. N. M. Adyanthaya acted as Inspector. The Inspector of Industrial Schools continued to act as Secretary to the Board of Visitors to the Government Industrial School, Madura, as a member of the Board of Examiners of the Government Fisheries Training Institute, Calicut, and as an official visitor to eleven central jails, and the Senior Certified School, Chingleput.

118. *State technical scholarships.*—No fresh scholarship was awarded for training outside India. The progress of the three scholars who were selected for training in the previous year in the subjects of (i) Canning, (ii) Sugar manufacture and (iii) By-products of the sugar industry was reported to be satisfactory.

119. *Scholarships tenable at the Victoria Jubilee Technical Institute, Bombay.*—One scholar was under training in Sanitary Engineering and Plumbing during the year, and he completed his course by the end of March 1935. As stated in the report of the previous year, the award of scholarships for study at this Institute was temporarily suspended, the funds thus rendered available

being utilized for providing training in other industrial subjects in which there is a greater prospect of the scholars finding suitable employment in the Presidency on the completion of their training.

120. *Scholarships tenable at the Andhra University College, Waltair.*—The development of the sugar industry having created a demand for sugar technologists, it was decided that the facilities provided by the Andhra University for the grant of the B.Sc. (Hons.) degree with technology as the main subject—the chemical technology including the technology of cane sugar—should be taken advantage of to secure a number of young men suitable for work under specialists with a view to their taking up later more responsible posts in sugar factories. Accordingly, Government instituted during the year six scholarships of the value of Rs. 40 each per mensem, tenable for a period not exceeding three years at the Andhra University College, Waltair, three of the scholarships at Rs. 60 each per mensem tenable at the Victoria Jubilee Technical Institute, Bombay, being diverted for this purpose. These six scholarships were awarded during the year.

121. *Scholarships tenable at the Harcourt Butler Technological Institute, Cawnpore.*—Of the three students who were awarded scholarships (two in 1932 and one in 1933) for a two-years course of study in sugar technology, two completed their training during the year. In view of the changed conditions, Government have decided not to depute any more candidates for training in this Institute.

122. *Scholarships tenable at the Benares Hindu University.*—The award of scholarships for study in Electrical Engineering in the Benares Hindu University has been discontinued since 1932 consequent on facilities becoming available for training in the subject in the local Engineering College. Of the six scholars deputed for training since the inauguration of the scheme in 1928, two were still undergoing training at the end of the year.

123. *Post-graduate scholarships tenable at the Indian Institute of Science, Bangalore.*—Seven new scholarships of the value of Rs. 60 each per mensem tenable for periods ranging from two to three years were awarded during the year. Of these, two were granted to ladies, this being the first occasion that these scholarships have been awarded to women candidates. There were ten scholars under training in the Institute at the beginning of the year as shown below:—

Electrical Technology	..	..	..	..	3
General Chemistry	..	..	..	..	2
Organic Chemistry	..	..	..	..	2
Bio-Chemistry	..	..	..	..	2
Sugar Technology	..	..	..	..	1
					—
					10
					—

124. *Scholarships tenable at the Indian School of Mines, Dhanbad.*—Of the four scholars deputed for training in Mining Engineering and Geology in the Indian School of Mines since 1928–29, three have completed their course, and one was under training during the year. Of the ex-scholars, one, it is understood, has proceeded to Europe for higher studies. The award of fresh scholarships for study in the school was discontinued from 1932.

125. *Scholarships tenable at Jamshedpur Technical Institute.*—As stated in last year's report, the selection of fresh students from this Presidency for training in the Institute was discontinued from 1930–31, and the final batch of three students completed their training in the Institute during the year. It is understood that the students who were deputed for training have been absorbed in the works establishment of the Tata Iron and Steel Company, Limited.

126. *Industrial scholarships.*—Under the provisions of Chapter IX of the Code of Regulations for Industrial Schools, sixty new scholarships tenable in each case for a period not exceeding five years, and ranging in value from Rs. 1–8–0 to Rs. 7–8–0 per mensem, were, as usual, awarded with effect from 1st July 1934, to pupils learning trades in various industrial schools recognized and aided by the department. A bonus equivalent to two months' average scholarship was also granted to such of the pupils as had satisfactorily completed the courses of study during the year.

127. *Government School of Technology, Madras.*—M.R.Ry. N. M. Adyanthaya Avargal, B.Sc., continued as Principal of the school during the year, except for about four months during which he was on other duty as acting Industrial Engineer and Inspector of Industrial Schools, when M.R.Ry. M. V. Jagannadha Ayyangar Avargal, acted as Principal of the school.

Admissions.—The number of new admissions during the year was 381 as against 397 during the previous year, of which 133 were admitted to the Electrical Engineering, 72 to the Mechanical Engineering and 59 to the Printing course, the remainder being distributed among the various other courses, such as Electric wiring, Plumbing and Vernacular drawing classes. The strength of the school on the 31st March 1935 was 964 as against 927, and the average number of classes held during a week was about the same as in the previous year.

Examinations.—The L.M.E. and L.E.E. diploma examinations were, as usual, conducted by outside examiners, namely, Messrs. A. C. Elder of Messrs. Marshall Sons & Co., Limited, and P. V. Chari, Electrical Engineer to Government, respectively. Twenty students qualified themselves for the L.E.E. and five for L.M.E. diploma. The Electric Wiring Competency Examination was conducted by Mr. J. Meek of the General Electric Company, Madras, and Mr. K. Subramaniam of the Madras Port Trust. Seventy-three students, including 41 private candidates, appeared for the examination, and 31 were awarded

competency certificates. Mr. G. Kenneth of the Press Advertising Company, Mr. A. M. Lawson of Messrs. Richardson and Cruddas, and Mr. R. R. Cooper, Chief Draughtsman of the Madras and Southern Mahratta Railway Company, conducted the examinations in Printing, Plumbing and Drawing, respectively. Fifty-seven candidates appeared for these examinations and 29 qualified themselves for the certificate. The school continued to be the centre for the Presidency for the City and Guilds of London Institute Examinations, for which 252 candidates from all over the Presidency appeared, and 111 came out successful. One of the successful candidates took the first rank in Radio Communication, Final Grade, and secured also a silver medal.

Scholarships.—In addition to the twelve Government scholarships tenable at the school for a period not exceeding five years, the Commissioner of Labour awarded three scholarships, while the trustees of the Sri Venkateswara Hostel awarded ten scholarships during the year. A Victoria Jubilee scholarship was awarded to a student of the school. Several poor students also received monthly stipends from charitable trusts and private persons.

Equipment.—The electrical laboratory was strengthened by the addition of a mercury arc rectifier, a cathode ray oscillograph, an armature notching press, and meters. Three hand presses obtained from the Government Press were added to the Printing section and classes in machine minding were started under the re-organized scheme.

Career of ex-students.—Of the 25 students who obtained L.M.E. and L.E.E. diplomas, 16 are reported to have secured suitable employment, and all the 5 who passed in Printing obtained appointments in printing works. With a view to assisting students in securing suitable employment, the Principal has started an Employment Bureau which keeps in touch with the past students and prospective employers.

128. *Preparatory section.*—The number of new admissions to this section was 57, of which twenty were Madras and Southern Mahratta Railway stipendiary students. The strength of the classes at the end of the year was 104. Eleven students completed their courses of study during the year and secured certificates.

129. *Perambur branch school.*—This school, which is attached to the Madras and Southern Mahratta Railway Workshops, continued to function satisfactorily, during the year. The strength of the school at the end of the year was 119 as against 175 in the previous year, the decrease being due to the restriction in the recruitment of fresh apprentices by the railway during the year. The final examinations were, as usual, conducted by the railway officials, and 20 students came out successful.

130. *Apprenticeships in the Buckingham and Carnatic Mills.*—In view of the difficulty of securing practical training in the workshops and factories in the city for youths with a secondary education who desire to follow the engineering and textile trades, an

arrangement was entered into with the Buckingham and Carnatic Mills by which the latter accept, on the recommendation of this department, a small number of youths every year for apprenticeship in the mills for a period of five years, and grant them facilities to attend the Government School of Technology. For six such vacancies the number of applications received was as many as 600.

131. *Government Industrial School, Madura—Staff.*—M.R.Ry. V. Raghava Ayyar continued as Superintendent of the school throughout the year.

Admissions and withdrawals.—During the year 24 candidates sought admission to the school, but only 14 actually joined. There were eight withdrawals, two left the school on account of illness, and the rest for want of means to continue their training. The strength of the school at the end of the year was 73 as against 76 in the previous year and 81 in 1933.

Examinations.—The annual and final examinations were as usual conducted in June 1934 by the Superintendent of the school, and Mr. J. H. Dickson, Manager of the Pasumalai Trade School, who constituted the Board of Examiners for the year. Of the 76 students who appeared for the examinations, 73 were declared to have passed. Fourteen final year students who satisfactorily completed their training in metal work and woodwork were awarded certificates.

Board of Visitors.—The Board of Visitors, which consists of officials and non-officials, with the Inspector of Industrial Schools as Secretary, met once during the year. The Board recommended the opening of an electric wiring class in the school, but for financial reasons the consideration of the recommendation was deferred by Government.

Hostel.—The hostel attached to the school functioned satisfactorily during the year. The present strength of the hostel is 40 consisting of 11 in the vegetarian mess and 29 in the non-vegetarian messes. The mess charges average about Rs. 9 per head per mensem.

Financial position.—Owing to the absence of reliable furniture makers in Madura, the demand on the school for high class furniture was heavy and it was found very difficult, with the available staff, to execute orders with the necessary promptitude. A fairly large number of orders for metal work and furniture were executed for Government departments, local bodies and the public during the year. The receipts and expenditure of the school for the year were Rs. 18,760 and Rs. 31,552 respectively. The net cost to Government of running the institution was thus Rs. 12,792 which is considerably less than the amount recommended by the Retrenchment Committee and accepted by Government, namely, Rs. 17,500.

132. *New Government schools.*—The Government Industrial schools at Calicut and Bellary and the Government Trades School at Mangalore, which were started in July 1929, continued to function satisfactorily. These schools, which are still on a temporary basis, their retention having been sanctioned for a further period of three years from 1st April 1934, provide a five years course of instruction in general mechanics and woodwork. The strength of these schools at the close of the year was 66 in Calicut, 56 in Bellary and 52 in Mangalore. The Boards of Visitors and the Selection Committees constituted for these schools continued to render useful service. The Calicut school participated in the All-India School Fair and Exhibition conducted by the United India Club, Calicut, and was awarded a gold medal for the excellence of its furniture, wooden toys and iron castings.

The receipts and expenditure of these schools for the year were—

	Receipts.	Expenditure.
	RS.	RS.
Calicut	8,868	20,181
Bellary	10,538	17,240
Mangalore	1,155	9,644
Total ..	18,561	47,065

The net cost to Government of running these institutions during the year was Rs. 28,504 as against Rs. 32,728 in the previous year.

133. *Aided industrial schools.*—The Inspector of Industrial Schools continued to supervise the non-textile schools, and the Assistant Director of Industries (Textiles), the textile schools. The Gokulam Cottage Industries School, Madras, the Lady Willingdon Leper Settlement Industrial School, Chingleput, the St. Vincent Girls' Industrial School, Calicut, the St. Thomas' Convent Industrial School, Mylapore, and the St. Anne's Industrial School, Rayapuram, were recognized by the department during the year. At the close of the year there were 72 recognized schools, excluding those managed by the department direct. On the 31st March 1935, there were 5,938 pupils receiving instruction in these schools, as against 6,199 in the previous year. Of these, 2,446 were Indian Christians, 1,493 Non-Brahmans (Hindus), 798 Brahmans, 442 Depressed Classes, 260 Muhammadans, 146 Europeans and Anglo Indians, 15 criminal tribes, 51 aborigines and hill tribes, 3 Parsees, 1 Buddhist and 283 others. A sum of Rs. 89,452 was distributed in the form of maintenance grant (including Rs. 4,452 capitation grant), representing an average of Rs. 15-1-0 per pupil per annum for the Presidency as against Rs. 14-2-0 per pupil per annum in the previous year. A further sum of Rs. 19,523 was distributed as equipment grant and Rs. 6,043 as building grant to certain schools. The teachers' training sections attached to the St. Joseph's Industrial School, Tindivanam, the C.S.M. Girls' Industrial School, Madras, and

the American Mission Industrial School for Women, Palmaner, Chittoor district, continued to function satisfactorily. The revised system of assessment of maintenance grants, to which reference was made in last year's report, came into force with effect from 1st April 1934, and the grants to schools were distributed during the year under the new system.

LEATHER TRADES INSTITUTE, MADRAS.

134. *Staff.*—M.R.Ry. P. K. Rajamanikkam Nayudu continued as Superintendent of the Institute, and M.R.Ry. K. Seshachallam Choudary as Leather Research Chemist, throughout the year.

135. *Advice and assistance to tanners.*—The Superintendent, as in previous years, visited several of the tanneries in and around Madras in order to correct irregularities, and to demonstrate to tanners on the spot the advantages of improved methods, and to give advice where difficulties in actual practice arose. The best and most economic methods of using the new synthetic tans in their processes were demonstrated to tanners. Advice was also given as to how to avoid stains, attributable to various causes, on prime tanned skins, as well as in regard to the manufacture of roller skins, and the fitting up of new leather machinery. The Superintendent visited some of the important collecting and salting centres of skins in and around Coimbatore in order to investigate the primary cause of stains on tanned skins. The Superintendent also visited the Central Jail, Vellore, in order to advise as to how the existing boot-making machinery could be utilized to the best advantage for the manufacture of boots for Government departments, and as to whether any additional machinery was necessary. Advice was also given in regard to the purchase by this jail of chrome and bark soles, russets and linings required for the manufacture of boots, sandals and belts. A number of tanners visited the Institute during the year, and advice was sought and given in regard to the best and cheapest method of preserving raw hides and skins for export, the use of various synthetic tans which have come on to the market, the processes of manufacture of roller and morocco skins of different shades, and as to suitable processes of manufacture of cheap chrome lining skins, sole leather, etc.

136. *Stains.*—In consultation with the Southern India Skin and Hide Merchants' Association, it was decided to resume the work on stains which had been carried on by Mr. Guthrie, the Special Officer, up to the time of his proceeding on leave preparatory to retirement, so that the value of the work already done might not be wholly lost to the industry. Mr. Guthrie worked on (i) salt stains, (ii) bubble grain, (iii) water stains, (iv) stains due to mould growth, (v) chipped grain, (vi) pitting, and (vii) miscellaneous stains, and he tried eight different chemicals as an addition to the salt used for curing hides and skins. According to the Special Officer, the best and most suitable supplementary

curing agents are "Preventol," sodium silico flouride and Atlas preservative. It was therefore decided to carry on the following experiments on stains: (i) adding chemicals to the salt used in curing the skins without washing the skins, (ii) first washing the skins in water alone and then adding chemicals to the curing salt, (iii) first washing the skins in an antiseptic such as "Preventol," carbolic acid, etc., and then adding chemicals to the salt, and (iv) repeating the first, second and third operations using Atlas preservative, sodium silico flouride and "Preventol" along with the curing salt. These experiments were started in July, and were still in progress at the end of the year. The problem of salt, water, and tan stains on Indian tanned hides and skins is becoming a serious one. The Committee of the Imperial Institute Advisory Committee on Hides and Skins drew attention during the period under review, to the increase in recent years of stains on Indian tanned hides, and there is no doubt that better prices would be forthcoming for hides and skins shipped from Madras if the defects due to stains could be eradicated, even partially.

137. *Other experiments.*—Experiments on the effect of using synthetic tans with different proportions of avaram bark, and at different stages of the tanning processes, continued to be carried on during the year. The experiments on the soaking of dry hides with the addition of various chemicals in various strengths, and at different periods in order to note the soaking effect, i.e., pliability of hides, feel, hair slipping property, colour, etc., were proceeded with.

138. *Leather Research Chemist.*—The activities of the Leather Research Chemist, who continued to function as the departmental industrial chemist in addition to his duties as Leather Research Chemist during the year, are summarized below:—

Mr. Seshachallam Choudary's work as Leather Research Chemist consists of (i) analyses for the tanning trade, (ii) rendering technical assistance to the leather trade of the Presidency, and (iii) conduct of fundamental research work in the science of leather manufacture. The Leather Research Chemist carried out a number of analyses in connexion with the leather industry, and of the 69 samples of different materials analysed in the laboratory during the year, 39 were of tanning materials extracts and syntans, 15 of leathers, 11 of waters used in tanneries, and 4 of lime and lime liquors. Two students were sent by tanners to receive training in the laboratory in the conduct of leather analyses. A sample of wool was dyed for a tanner. The advisability of adding synthetic tannins to a tanning material in order to improve its quality was explained to a tanner after analysing several samples of tan liquors. The comparative properties of different samples of avaram bark of different ages, and from different places, were explained in detail to a tanner after the samples had been

analysed. Information as to the comparative value of two samples of lime sent by a tanner was communicated to him after the necessary analyses had been carried out.

139. *Synthetic tannins.*—The use of synthetic tannins has come to stay in the tanning of South Indian skins, and moreover an increasing number of these products is coming on to the market. An investigation was initiated during the year with a view to ascertaining whether synthetic tans, which are now used chiefly as bleaching agents, could not be used to better advantage, that is, whether the tannin content of the syntans could not be utilized more fully. This involves analysing the syntan liquors before and after putting the skins through, and ascertaining how much of the tannin of the syntan remains in the liquor, using syntan along with avaram liquor in different liquors and analysing them, and determining the speed of diffusion of avaram liquor alone and liquor to which different quantities of syntan have been added. As a preliminary to the conduct of this investigation, analyses of the various synthetic products on the market were undertaken and completed during the year. The investigation proper is now in progress.

140. *Avaram.*—Avaram bark is still the only tanning material used for the tanning of sheep and goat skins in South Indian tanneries. Although the cost of avaram bark is high relative to its tannin content, this is compensated by other properties which are peculiar to it. A factor which increases the cost of avaram bark is that the shrub is not cultivated in plantations, but grows wild, and the cost of collection of the bark thus forms the greater part of the cost. The most economic exploitable age of avaram bark had not been determined, nor had any systematic examination of the bark from seedling plants and coppice shoots of varying ages and growing on different soils been attempted until plantations were raised recently by the Forest department in Anantapur, Nellore and Vizagapatam divisions. Samples of barks from these localities were sent periodically to the Leather Research Chemist for analyses. The analyses of barks from plants raised from seeds in all the plantations were completed during the year, and the second stage, consisting of the analyses of barks from coppice shoots produced by stumps of known ages has been commenced. These barks will continue to be sent to the Leather Research Chemist for analyses until 1936, by when it is hoped there will be sufficiently reliable data to regulate the exploitation of this valuable bark on scientific and economic lines.

141. *Preparation of activated charcoal from spent tanning materials.*—The spent bark available in South Indian tanneries is not made use of except as fuel. Experiments were therefore conducted by the Leather Research Chemist at the Indian Institute of Science, Bangalore, on the preparation of activated charcoal from the spent tanning materials. The tanning materials used for the purpose were avaram and wattle barks and myrobalan nuts, and

two methods were employed, namely, gas activation and impregnation. The experiments indicate that activated charcoal suitable for decolourizing sugar solutions can be prepared from spent tanning barks.

142. *General chemical work.*—The carrying out of analyses and chemical experiments, and of special investigations in which industrial chemistry plays a part continued to absorb an appreciable proportion of the time of the Leather Research Chemist, who dealt with about 80 chemical enquiries during the year. These included enquiries or investigations in regard to the preparation of sugar and jaggery, manufacture of coir from coconut husks, preparation of matches, plantain, hemp and pine apple fibres, Fullers earth, manufacture of crucibles, hand made paper, magnesium from magnesite, starch from rice, indigo, etc. About 25 per cent of the materials analysed in the laboratory of the Leather Trades Institute during the year were of a general industrial character. An investigation into the retting of coconut husks for the production of coir in the Baruva area of the Ganjam district was carried out. The Leather Research Chemist continued to be in charge of the teaching of general chemistry to the first year students of the Government Textile Institute. This consisted of two lectures and four hours practical work per week in addition to correcting the record books of about thirty students every fortnight.

SCHOOL OF ARTS AND CRAFTS, MADRAS.

143. *Staff.*—M.R.Ry. D. P. Roy Choudury was in charge of the school during the year.

144. *Strength and attendance.*—The number of students on the rolls on the 31st March 1935 was 269 as against 266 in the previous year. The average attendance was 232, and the percentage of attendance during the year was 79 as against 78 in the previous year.

145. *General.*—The steady progress in all departments of the school recorded in the reports of the two previous years was well maintained during the period under review, the students continuing to evince a keen interest in their work. Experiments on cotton painting and printing and lacquer work were continued, whilst the efforts made to introduce opaque colour in the Lacquer work section of the school were attended with a measure of success. A reference was made in the report of the previous year to the initiation of experiments on enamelling on gold and silver and other metals. The apparatus and appliances ordered during the previous year were received and fitted up during the period under review, and though the enamelling work was still in an experimental stage, eleven students belonging to the fourth and fifth year classes of the engraving and goldsmith departments of the school were given instruction in the art, and there was a considerable demand for admission into this section from a number of old pupils of the school. Accordingly proposals were submitted to

Government for the formation of a regular enamelling section, and these having since been sanctioned by Government, a new section will be started from July 1935. It is hoped that, as a result of this development a new line of work will be opened up for the craftsmen of the Presidency, and that in course of time, an artistic enamelling industry will be established. In view of the growing seriousness of the unemployment problem, the question of whether instruction in a wider range of crafts could not be given in the school, is engaging my attention.

146. *Fine Arts section.*—Fine Arts have a definite cultural and social value, and this section of the school continued to make good progress during the year, the students again producing some excellent specimens of work in painting and sculpture, many of which were exhibited, as usual, at the annual School Exhibition, and the Madras Fine Arts Society's Exhibition. Two of the students' pictures were sold at Burlington House, London.

147. *Examinations.*—The results of the various Government Technical examinations during the year are shown below with the comparative figures in respect of the two preceding years:—

Year.	Number appeared.	Number passed.	Per cent.
1932-33	21	21	73.50
1933-34	18	12	67.00
1934-35	16	11	68.75

The Grigg Memorial Gold Medal, awarded by the Director of Public Instruction to the one who stands first in the Presidency in the painting examination—higher grade—was won by S. V. S. Rama Rao, a student of the Fine Arts section of the school. The annual school examinations were conducted in April, and the students of the arts and crafts sections, who left the school after completing their training and passing the examinations, were awarded diplomas. The Cotton Memorial Prize—a gold medal—given by the Victoria Technical Institute, was awarded to N. Veeraraghavan, a student of the Goldsmith department, whilst, the Rao Bahadur N. R. Balakrishna Mudaliyar gold medals were awarded to L. Santhanaswami and N. S. Loganathan, students of the Engraving department.

148. *Stipends and scholarships.*—The number of stipends and scholarships awarded to students in the school from various sources was 98 as shown below:—

(i) Adi-Dravida stipends	72
(ii) School stipends	15
(iii) Victoria Technical Institute scholarships	7
(iv) Hyderabad State scholarships	2
(v) Sri Venkateswara scholarship	1
(vi) Mayurbanj State scholarship	1
Total	98

149. *Financial statement.*—The expenditure for the year amounted to Rs. 43,993-0-10 against Rs. 43,560-13-7 in the year 1933-34. The net cost of the school was Rs. 38,747-1-10. The annual stock verification of the school was conducted by the Sericultural Expert.

150. *Exhibitions.*—The annual exhibition of Fine and Applied Art, representative of the work of the students and staff of the school, was held in January 1935, and was attended by His Excellency the Governor of Madras and Lady Marjorie Erskine, as well as by a number of other distinguished persons. The numerous visitors appeared to be favourably impressed with the standard and merit of the exhibits, the articles of furniture in particular, being much admired for their fine execution and artistic design. Over a hundred articles were exhibited in the enamelling section, which constituted a special attraction. Other articles exhibited in addition to drawings, paintings and sculptures, included specimens of wood work, gold work, lacquer work, cotton painting and printing. The value of the articles sold amounted to Rs. 2,795, of which paintings of the students accounted for Rs. 1,795. The exhibition generally was favourably commented upon in the local newspapers.

PROGRAMME OF WORK FOR 1935-36.

151—

I. Bureau of Industrial and Commercial Information.

Review of the position and possibilities of further development of the cashewnut industry—

II. Engineering section.

- (a) Continuance of the efforts to increase the depth bored during a year, and to reduce as far as possible the cost of boring.
- (b) Continuance of demonstrations and propaganda in connexion with the manufacture of white sugar by the open pan method and centrifugal machinery.
- (c) Conduct of experiments on the manufacture of sugar from palmyra juice in the Tinnevely district.

III. Education section.

- (a) Revision of the departmental bulletin on the starting of industrial schools.
- (b) Drawing up of a scheme, in conjunction with the District Board, Anantapur, for the establishment of an industrial school under the Board's management.

IV. Textile section.

- (a) Organization and supervision of the scheme for the development of co-operative buying and selling on behalf of the handloom weavers, and for the better organization and improvement of the handloom weaving industry, with the aid of the subvention from the Government of India.

- (b) Framing of proposals for the development of the gold-thread industry on cottage industry lines.

V. Sericulture.

- (a) Organization and supervision of the production and distribution of 'cellular' seed, and the conduct of research on silk worm diseases in accordance with the subvention scheme of the Government of India.
- (b) Production of an improved quality of cocoons by hybridization and distribution of the cocoons to rearers.
- (c) Conduct of experiments with a view to increasing the yield of mulberry leaves by cultural and manurial improvements.
- (d) Rearing of Uni-voltine European worms, and hybrid Japanese and Chinese crosses in the Government farms.

VI. Kerala Soap Institute, Calicut.

- (a) Conduct of experiments on the refining of groundnut oil with special reference to the possibility of preparing and adding Vitamin D to the refined oil in order to increase its nutritive value.
- (b) Continuance of the experiments on the possibilities of using refined groundnut oil as a salad oil in the place of imported olive oil.
- (c) Conduct of experiments on the preparation of insecticidal soaps from roasted cashewnut rinds.
- (d) Conduct of experiments on the curing of ginger by the improved methods practised in Jamaica.

VII. Leather Trades Institute, Madras.

- (a) Continuance of the experiments on the soaking of dry hides.
- (b) Continuance of the investigation of the bacterial effect in the elangaram process.
- (c) Systematic study of the methods employed in Madras tannages.
- (d) Study of the use of synthetic tannins in Madras tannages.
- (e) Conduct of further experiments on the preparation of activated charcoal from spent tanning materials.

VIII. School of Arts and Crafts.

- (a) Continuance, and further development, of the experiments on enamelling on gold, silver and other metals.
- (b) Study of the question whether instruction in a wider range of crafts could not be given in the school.

RECEIPTS AND EXPENDITURE.

152. The following statement compares the receipts and expenditure of the department during the years 1933-34 and 1934-35. Details are exhibited in Appendix I.

Item.	1933-34.	1934-35.	Decrease — or Increase +.
	RS.	RS.	RS.
Expenditure	9,13,206	10,96,493	+ 1,83,287
Receipts	1,58,403	3,94,520	+ 2,36,117
Net cost ..	7,54,803	7,01,973	— 52,830

It will be observed that there has been an increase, both under expenditure and receipts during the year under review as compared with the previous year. This is due to the application of the gross budgeting system to the commercial concerns of the department, namely, the Kerala Soap Institute, Calicut, and the Industrial Engineering Workshops, Madras, as a result of which the gross expenditure and receipts of these concerns are now shown under the respective heads of the departmental accounts, instead of only the net result (loss or gain) of the working of the concerns as hitherto.

Expenditure.—There has been a decrease in the expenditure under the heads, Direction, Industrial Scholarships, Industrial Schools, School of Technology and Experiments on Oils and Fats at the Kerala Soap Institute to the extent of about Rs. 54,000, as compared with that of the previous year, while there has been an increase in expenditure under District Engineering and Grants-in-aid to Industrial Schools to the extent of Rs. 23,500. The fall under Direction was due mainly to the transfer during the year of the debit of Rs. 5,000 representing the contribution to the Indian Institute of Science, Bangalore, from Direction to Grants-in-aid to Industrial Schools, and this also accounts for the increase under the latter head. The decrease under Industrial Scholarships was due to the non-award of certain scholarships during the year, and that under Industrial Schools and School of Technology, mainly to the non-purchase of stores and machinery to the extent that was done in the previous year. The decrease under Miscellaneous Experiments, including Experiments on Oils and Fats, was due to the restricted production of refined oils at the Kerala Soap Institute. The increase under District Engineering was a result of an expansion in the activities of this section of the department.

Receipts.—There was an increase under receipts from the Pumping and Boring section and under Industrial Schools, as compared with the previous year.

The net cost of the department further declined by Rs. 52,830 to Rs. 7,01,973. In the last four years the net expenditure of the department has fallen by as much as Rs. 5,95,616.

APPENDIX I.
Statement showing the Receipts and Charges of the Department of Industries for the year 1934-35.

Receipts.		Expenditure.	
RS.	A. P.	RS.	A. P.
Pumping and boring	73,664 4 7	A. Direction	1,16,897 4 9
Industrial installations	3,604 7 9	B. District Engineering	3,26,703 8 11
Industrial schools	64,564 12 8	C. Grants in aid to Industrial Schools	1,29,188 14 0
School of Arts and Crafts	5,245 15 0	D. Industrial Scholarships	21,880 11 9
Textile Institute	322 0 6	E. Industrial Schools	78,545 6 5
Sericulture	1,312 0 7	F. School of Technology	81,448 11 8
Sugarcane mills	1,933 8 0	G. Leather Trades Institute	21,971 10 6
Printers' ink	750 0 0	H. School of Arts and Crafts	43,993 0 10
Rents of buildings	353 9 0	J. Textile Institute	42,632 4 7
Kerala Soap Institute	1,68,690 12 3	L. Sericulture	27,734 8 6
Industrial Engineering Workshops	76,575 14 0	M. Kerala Soap Institute, Calicut	1,52,521 4 10
Other receipts	3,041 3 4	Experiments on oils and fats at the Kerala Soap Institute, Calicut, etc.	6,967 1 4
Total	4,00,058 7 8	N. Industrial Engineering Workshops	52,650 12 6
Recoveries of overpayments	2,882 7 0	Total	11,02,135 4 7
Collection of payments for services rendered	97 4 0	Expenditure in England—Stores	3,840 0 0
Total	4,03,038 2 8	Other than stores	18,160 0 0
Deduct Refunds.	— 8,518 5 8	Total	11,24,135 4 7
Net Receipts	3,94,519 13 0	Deduct—	
Net cost of the department	7,01,973 7 9	Recoveries of Investments in Government Commercial concerns	— 27,571 15 10
Total	10,96,493 4 9	Gain by exchange	70 0 0
		Total	10,96,493 4 9

N.B.—The figures are provisional as they are subject to modifications in the March final and supplemental accounts.

Statistics relating to Government and recognized Industrial Schools for 1934-35.

[illegible]

	52	56	..	..	56	2	..	..	..	* Motor mechanics and carving .. 6
10 Anjuman Industrial School, Melvaram.	52	56	..	..	..	2	..	..	..	(c) Free hand outline and Geometrical drawing .. 9
11 Anjuman Industrial School, Tiruppattur.	28	31	..	..	..	..	..	..	..	Design .. 1
12 Das Boseo Industrial School, Vellore.	25	25	..	..	..	..	..	..	..	Painting Building drawing .. 1
13 St. Joseph's Industrial School, Tindivanam.	77	50	..	..	..	11	..	..	..	
14 Danish Mission Industrial School, Pauruti.	87	101	..	..	..	71	..	30	..	
15 C.S.M. Agricultural School, Chingleput.	62	57 +	..	6	..	14	..	..	(d)	+ All take to agriculture, poultry farming, col- making, cattle-breeding and mat-weaving.
16 A.A.M. Industrial School, Velacheri, St. Thomas' Mount.	26	24	..	..	24	2	..	..	(e)	(d) Tape ma- king .. 30
17 St. Joseph's Industrial School, Coimbatore.	230	211	61	7	..	150	18	..	(f)	Net making. 10
18 London Mission Boys' Weaving School,	109	51	..	..	..	..	..	51	..	(g) Masonry .. 20
19 P.B.C. & Sons Charity Industrial Institute, Pedamentu.	75	103	41	5	..	17	..	20	..	(f) Electric wiring .. 20
20 Raja's Industrial School, Palakimedl.	25	29	..	..	20	2	..	..	..	Probationary. 8
21 C.B.M. Industrial School, Samalpet.	42	39	..	..	39	4	..	..	..	
22 U.L.C.M. Rural Reconstruction School, Guntur.	26	20	..	..	..	..	..	..	..	+ All students receive instruction in Agriculture, bee keeping, poultry, sanitation, rural reconstruction work, etc.
23 American Mission Cabinet making School, Guntur.	27	43	..	..	43	..	..	..	..	(g) Leather work 39
24 Commonwealth Trust Engineering Classes, Mangalore.	8	13	..	13	..	..	..	..	..	(h) Electric wh- ing .. 16
25 Sri Krishna Pariparamayan, Kavu-taran.	25	25	..	..	25	..	..	..	..	Drawing .. 122
26 C.M.S. Industrial School, Vidyanagar.	50	39	..	..	..	..	..	..	(g)	138
27 St. Joseph's Industrial School, Gundala.	67	77	8	..	69	11	..	..	..	
28 Municipal Technical Institute, Masulipatan.	85	107	107	..	..	..	..	..	..	
29 C.N.T. Institute, Vepery.	424	463	241	73	14	4	41	2	..	(h)
30 Anjuman Industrial School, Madras.	79	90	..	..	53	..	7	..	..	138 5
31 Orr Assisted Industrial School, Madras.	40	49	..	..	..	..	..	..	..	\$ Tailoring.
									(i)	(i) 33 Scientific instruments making.

APPENDIX II—cont.

Statistics relating to Government and recognized Industrial Schools for 1934-35—cont.

Serial number, name and place of institution.	Number on rolls on 31st March.		Metal working or Engineering trades.		Engine tending.		Wood working trades.		Rattan work.	Textiles cotton.		Textiles wool.		Other textile trades.		Lace kn. and other needle work.		Other subjects specified in remarks column.)		Particulars as to after career of students passed out in last two years.		Remarks.
	1934.	1935.	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
(1)																						
32 Amara Schools (Boys)—cont.																						
32 Basavanna Industrial School, Bangalore.	20	28	28	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10-3 Ba.
33 St. Mary's Industrial School, Bangalore.	12	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	* Automobile engineering
34 The Madras Penitentiary, Madras.	53	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	(j) 13
35 Prakash Trade School, Bangalore.	60	56	13	3	..	..	30	3	..	..	..	..	..	..	..	..	..	..	..	..	..	(j) 13
36 C.M.M. Industrial School, Bangalore.	41	45	..	..	..	..	45	10	..	..	..	..	..	..	..	..	..	..	..	..	..	(j) 13
37 St. Joseph's Industrial School, Bangalore.	56	50	..	..	..	..	50	..	..	..	..	..	..	..	..	..	..	..	..	..	..	(j) 13
38 St. Francis's Industrial School, Bangalore.	29	27	..	..	..	..	27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	(j) 13
39 St. Francis Xavier Industrial School, Bangalore.	106	83	..	..	..	..	44	..	..	39	..	..	..	..	..	..	..	..	..	..	..	(j) 13
40 St. Mary's Industrial School, Kumbakonam.	74	76	10	..	..	..	66	..	..	..	..	..	..	..	..	..	..	..	..	..	..	(j) 13
41 Municipal Industrial School, Kumbakonam.	23	31	..	..	..	..	20	..	..	11	..	..	..	..	..	..	..	..	..	..	..	(j) 13
42 Poraiya School, Tanjore.	120	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	(j) 13
43 S.P.G. Art Industrial School, Massey.	130	144	25	3	..	..	93	8	..	..	..	..	..	..	..	..	..	..	16	4	..	† Tailoring

44 St. Joseph's Industrial School, Adalapuram.	45	113	†	..	..	..	60	1	..	..	51	..	..	..	..	..	..	..	..	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
45 C.M.S. Industrial School for the Blind, Palamcottah.	38	66	..	..	..	..	..	..	12	..	\$ 54	..	..	..	..	..	..	..	..	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
46 St. Ignatius Industrial School, Tuticorin.	33	26	..	..	..	..	26	3	..	..	..	..	..	..	..	..	..	..	..	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
47 Arabian's Industrial School, Arumuganeri.	123	126	..	..	..	..	59	..	..	..	..	..	..	..	..	..	..	..	67	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
48 St. Joseph's Industrial School, Trichopoly.	73	101	36	5	..	..	65	3	..	..	..	..	..	..	..	..	..	..	..	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
49 Methodist Mission Industrial School, Kurnool.	92	90	5	..	..	..	60	..	4	..	21	1	..	..	..	..	..	..	..	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
50 All Saints Industrial School, Puthur.	28	31	..	..	..	..	31	6	..	..	..	..	..	..	..	..	..	..	..	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
51 The Gokulam Cottage Industries School, Madras.	..	32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
52 The South Indian Community Training School, Mayanur.	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
AIDED SCHOOLS (GIRLS).																						
53 Danish Mission Industrial School, Keelur, Tirukkoyilur.	32	33	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
54 St. Joseph's Convent Industrial School, Bellary.	87	67	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	67	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
55 C.S.M. Lace School, Chingleput.	60	56	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	56	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
56 Methodist Mission Industrial School, Ikkaadu.	119	66	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	66	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
57 St. Antony's Industrial School, St. Thomas Mount.	56	49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
58 A.A.M. Women's Industrial School, Palmaner.	70	56	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	56	3	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
59 I.M. Girls' Industrial School, Erode.	72	51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.
60 Methodist Mission Industrial School for Women, Dharampuram.	36	33	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	† Includes half time workers and 9 girls students in wood working also study blacksmithy. \$ Includes 26 girls.

Statistics relating to Government and recognized Industrial Schools for the year 1934-35—cont.

Serial number, name and place of institution.	Number on rolls on 31st March.		Metal working or engineering trades.		Engine tending.		Wood working trades.		Hattan work.		Textiles cotton.		Textiles wool.		Other textile trades.		Lace embroidery and other needle work.		Other subjects (specified in remarks column).		Particulars as to students passed out in last two years.	(23)	
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)			(22)
(1) AIDED SCHOOLS (GIRLS)— <i>cont.</i>																							
61 The Immaculate Conception Convent, Coimbatore.	80	93	..	..	..	..	..	..	..	..	..	..	..	..	..	..	98	..	..	..	..		
62 St. Joseph's Orphanage Industrial School, Gudur.	23	27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27	8	..	..	..		
63 C.S.M. Girls' Industrial School, Kiltank.	55	59	..	..	..	..	..	..	..	..	..	..	..	..	..	..	59	44	..	..	..		
64 Madras Seva Sadan Industrial School, Chetput.	57	60	..	..	..	..	..	7	..	..	..	..	..	..	..	..	53	3	..	..	..		
65 St. Bridget Industrial School for Girls, Nungambakkam.	40	47	..	..	..	..	..	..	..	..	..	..	..	..	..	..	47	..	..	..	..		
66 St. Joseph's Industrial School, Madurai.	61	64	..	..	..	..	..	..	..	..	..	..	..	..	..	..	64	13	..	..	..		
67 The Commonwealth Embroidery School, Calicut.	35	36	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36	10	..	..	..		
68 O.E.L.M. Girls' Industrial School, Gudur.	29	41	..	..	..	..	..	..	..	..	..	..	..	..	..	..	41	..	..	..	..		
69 Nazareth Convent Girls' Industrial School, Ootacamund.	50	27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27	..	..	..	..		

[illegible]

APPENDIX III.

Statistics relating to Government and recognized Industrial Schools for the year 1934-35.

Serial number, name and place of institution.	Number on rolls on 31st March 1935.	Receipts from			Receipts and expenditure to the nearest rupee.										Non-recurring.			
		RS.	RS.	RS.	Total recurring cost (excluding expenditure on new buildings and equipment).	Fees.	Sales.	Total, columns (4) and (5).	Net recurring cost, column (3) minus column (6).	Net recurring cost per pupil, column (7) ÷ column (2).	Maintenance.	Scholarships.	Stipends.	Recurring grants from other departments or public bodies.	Total recurring grant, add columns (9), (10), (11) and (12).	Balance of recurring cost met by managers' funds, column (14) minus column (13).	Expenditure on new buildings.	Building grant.	Equipment grant.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)		
GOVERNMENT INSTITUTIONS.																		
1 Government Textile Institute, Madras.	73	42,632	322	..	322	42,310	580	..	2,464	..	..	2,464	39,846	..	..	..		
2 School of Arts and Crafts, Madras.	263	43,993	271	4,886	5,245	38,748	147	..	1,364	..	..	1,364	37,384	..	..	..		
3 Government School of Technology, Madras.	1,270	81,449	24,843	..	24,848	56,601	47	..	2,166	..	..	2,166	54,435	..	..	..		
4 Government Industrial School, Madras.	73	31,552	..	18,760	18,760	12,792	175	..	57	..	..	57	12,735	..	..	..		
5 Government Industrial School, Bellary.	56	17,240	..	10,538	10,538	6,702	120	..	2,049	..	120	2,049	4,653	..	..	..		
6 Government Industrial School, Calicut.	51	20,181	..	6,968	9,863	13,313	261	..	2,173	..	104	2,173	11,140	..	..	..		
7 Government Trade School, Mangalore.	52	9,644	24	1,155	1,179	8,465	164	..	..	..	..	..	8,465	..	..	..		
AIDED SCHOOLS (BOYS).																		
8 A.A.M. Industrial School, Katpadi.	100	1,37,204	569	43,364	43,933	93,271	933	3,600	170	..	..	3,770	89,501	..	..	..		
9 Anjuman Industrial School, Vellore.	88	15,014	..	7,662	7,662	7,352	84	2,150	247	..	..	2,397	4,955	..	..	650		
10 Anjuman Industrial School, Melvisharam.	56	11,130	..	2,223	2,223	8,907	177	1,300	203	..	..	1,503	7,404	..	..	200		
11 Anjuman Industrial School, Tirupattur.	31	2,994	..	40	40	2,954	95	630	96	..	..	726	2,228	..	..	300		
12 Don Bosco Industrial School, Vellore.	25	7,623	..	2,368	2,368	5,260	210	550	..	..	..	550	4,710	..	..	90		
13 St. Joseph's Industrial School, Tindivanam.	80	35,966	..	9,550	9,550	26,416	330	3,300	632	2,160	..	6,098	20,318	..	..	400		
14 Danish Mission Industrial School, Panruti.	101	23,749	..	9,411	9,411	14,338	142	2,500	95	..	..	2,595	11,743	..	..	..		
15 C.S.M. Agricultural School, Chingleput.	57	6,880	..	838	838	6,042	106	850	127	..	..	977	5,065	..	..	218		
16 A.A.M. Industrial School, Veilacheri, St. Thomas Mount.	27	4,066	48	1,833	1,881	2,184	81	550	43	..	..	593	1,591	..	..	150		
17 St. Joseph's Industrial School, Coimbatore.	211	99,779	52	58,253	58,305	41,474	197	2,100	445	..	..	2,545	38,929	..	..	200		
18 London Mission Boys' Weaving School, Erode.	51	10,221	40	3,351	3,421	6,800	133	1,400	59	..	..	1,459	5,341	..	..	..		
19 P.S.G. & Sons Charity Industrial Institute, Peelamedu.	106	8,700	..	1,675	1,675	7,025	66	1,500	117	..	..	1,617	5,408	..	5,943	4,240		
20 Raja's Industrial School, Parakimedi.	29	7,037	..	1,540	1,540	5,497	190	600	186	..	..	786	4,711	..	..	..		
21 C.B.M. Industrial School, Samalkot.	39	42,719	28	25,614	25,642	17,077	438	1,250	59	..	..	1,309	15,768	..	..	162		
22 U.I.C.M. Rural Reconstruction School, Guntur.	20	7,735	160	1,639	1,799	5,936	297	1,170	23	..	..	1,193	4,743	..	..	500		
23 American Mission Cabinet-Making School, Guntur.	43	28,567	64	11,907	11,971	16,596	336	700	30	..	..	730	15,866	..	..	..		
24 Commonwealth Trust Engineering Classes, Mangalore.	13	941	..	..	..	941	72	300	30	..	..	330	611	..	..	..		
25 Sri Krishna Parishramalayam Industrial School, Kavutharam.	25	2,942	..	..	..	2,942	118	550	..	..	..	550	2,392	..	..	..		
26 C.M.S. Industrial School, Vidyanagar.	39	3,449	..	1,043	1,043	2,406	62	550	18	..	..	568	1,838	..	..	58		
27 St. Joseph's Industrial School, Gunadala.	77	18,547	..	5,875	5,875	12,672	165	2,400	386	..	..	2,786	9,836	..	100	308		
28 Municipal Technical Institute, Masulipatam.	107	37,708	..	14,916	14,916	22,792	213	3,000	102	..	..	3,102	19,690	..	..	..		
29 C.N.T. Institute, Vepery, Madras.	463	53,794	20,785	4,826	25,611	28,133	61	5,580	1,057	..	..	6,637	21,546	..	..	1,999		
30 Anjuman Industrial School, Madras.	90	21,722	..	6,256	6,256	15,466	172	5,780	..	..	..	5,780	9,686	..	..	80		
31 Orr Assisted Industrial School, Madras.	49	5,400	..	..	..	5,400	110	2,700	..	..	..	2,700	2,700	..	..	..		
32 Ramakrishna Mission Industrial School, Melapore.	28	9,172	721	170	900	8,272	296	2,200	155	..	..	2,355	5,917	..	..	5,000		
33 Sri Ram Motor School, Madras.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
34 The Penitentiary, Madras.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
35 Pasumalai Trade School, Pasumalai.	56	39,414	195	24,493	24,688	14,726	263	1,500	159	..	116	1,775	12,951	..	..	..		
Not financially aided.																		
Do.																		

Not financially aided.

Do.

Statistics relating to Government and recognized industrial schools for the year 1934-35—cont.

Serial number, name and place of institution.	Receipts from			Receipts and expenditure to the nearest rupee.														
	(2) Number on rolls on 31st March 1935.	(3) Total recurring cost (excluding expenditure on new buildings and equipment).			(4) to (17)													
		(4) R.S.	(5) R.S.	(6) Total, columns (4) and (5).	(7) Net recurring cost, column (3) minus column (6).	(8) Net recurring cost per pupil, column (7) ÷ column (2).	(9) to (11) Recurring grants from Department of Industries.			(12) Recurring grants from other departments or public bodies.	(13) Total recurring grant, add columns (9), (10), (11) and (12).	(14) Balance of recurring cost net of managers' funds, column (7) minus column (13).	(15) Expenditure on new buildings.	(16) Building grant.	(17) Equipment grant.			
AIDED SCHOOLS (BOYS)—cont.																		
36 C.S.M. Industrial School, Dindigul.	45	28,161	..	5,671	5,671	12,235	15,144	199	1,850	225	..	..	..	..	..	..	..	
37 St. Joseph's Industrial School, Ootacamund.	50	30,747	..	14,665	14,667	16,080	322	1,400	69	..	..	..	..	..	..	..	..	
38 St. Therese's Industrial School, Salem.	27	3,191	..	1,200	1,203	1,991	74	500	52	..	..	..	..	..	..	..	..	
39 St. Francis Xavier Industrial School, Tanjore.	83	22,723	..	8,753	8,753	13,970	163	1,450	286	..	..	..	..	..	..	..	..	
40 St. Mary's Industrial School, Kumbakonam.	76	27,379	..	12,235	12,235	15,144	199	1,850	225	..	..	..	..	..	..	..	..	
41 Municipal Industrial School, Kumbakonam.	31	4,082	..	354	354	3,728	120	1,150	40	..	..	..	..	..	..	..	..	
42 Borsal School, Tanjore.	144	28,457	..	10,664	10,664	17,793	124	3,600	242	..	..	..	..	..	..	..	..	
43 S.P.G. Art Industrial School, Nazareth.	113	6,772	..	1,433	1,433	5,339	47	1,100	..	..	..	..	..	..	..	..	..	
44 St. Joseph's Industrial School, Adakkalapuram.	66	9,142	..	6,091	6,091	3,051	46	1,800	188	..	..	..	..	..	..	..	..	
45 C.M.S. Industrial School for the Blind, Palamcottah.	26	4,850	..	1,141	1,141	3,709	143	750	153	..	..	..	..	..	..	..	..	
46 St. Ignatius Industrial School, Tuticorin.	126	7,252	..	187	187	7,065	56	1,000	27	..	..	..	..	..	..	..	..	
47 Anbian's Industrial School, Arumuganeri.																		
AIDED SCHOOLS (GIRLS).																		
48 St. Joseph's Industrial School, Trichinopoly.	101	65,176	..	28,942	28,942	36,234	359	1,800	266	..	..	..	..	..	..	..	..	
49 Methodist Mission Industrial School, Keelur, Tirukottai.	90	49,059	..	26,264	26,264	42,795	476	2,200	653	..	..	..	..	..	..	..	..	
50 All Saints Industrial School, Puthur.	31	14,232	..	7,522	7,522	6,760	218	950	132	..	..	..	..	..	..	..	..	
51 The Gokulam Cottage Industries School, Madras.	32	734	..	75	75	659	21	..	..	..	..	..	..	..	..	..	..	
52 The South Indian Community Training School, Mayanur.	25	1,180	..	100	100	1,080	43	..	..	..	..	..	..	..	..	..	..	
AIDED SCHOOLS (GIRLS).																		
53 Danish Mission Industrial School, Keelur, Tirukottai.	33	11,237	..	3,354	3,354	7,883	239	200	159	..	..	..	..	..	..	..	..	
54 St. Joseph's Convent Industrial School, Bellary.	67	4,060	..	436	436	3,624	54	700	..	..	..	..	..	..	..	..	..	
55 C.S.M. Lace School, Chingleput.	56	4,467	..	881	881	3,586	64	600	..	..	..	..	..	..	..	..	..	
56 Methodist Mission Industrial School, Ikkadu.	66	26,429	..	16,803	16,803	9,626	15	1,500	320	..	..	..	..	..	..	..	..	
57 St. Anthony's Industrial School, St. Thomas Mount.	49	8,960	..	320	320	8,640	177	570	..	..	..	..	..	..	..	..	..	
58 A.A.M. Women's Industrial School, Palmarner.	56	13,927	..	4,615	4,615	9,282	166	1,400	145	480	..	..	..	..	..	..	..	
59 L.M. Girls' Industrial School, Erode.	51	10,221	40	3,381	3,421	6,800	138	300	..	..	..	..	..	..	..	..	..	
60 Methodist Mission Industrial School for Women, Dharpuram.	33	6,462	16	2,857	2,873	3,589	109	200	..	..	..	..	..	..	..	..	..	
61 The Immaculate Conception Convent, Coimbatore.	98	10,023	..	591	591	9,432	96	950	..	..	..	..	..	..	..	..	..	
62 St. Joseph's Orphanage Industrial School, Guntur.	27	2,960	61	330	331	2,569	95	500	32	..	..	..	..	..	..	..	..	
63 C.S.M. Girls' Industrial School, Kilpauk.	59	7,609	249	1,546	1,795	5,814	99	697	398	336	..	..	..	..	..	..	..	
64 Madras Seva Sadan Industrial School, Chetpat.	60	3,216	194	555	749	2,467	42	800	..	..	..	..	..	..	..	..	..	
65 St. Bridget Industrial School for Girls, Nungambakam.	47	4,930	..	1,069	1,069	3,861	82	600	..	..	..	..	..	..	..	..	..	
66 St. Joseph's Industrial School, Madras.	64	6,051	..	2,281	2,281	3,770	59	347	401	..	..	..	..	..	..	..	..	
67 The Commonwealth Embroidery School, Calcutta.	36	3,864	8	1,761	1,769	2,095	58	680	51	..	..	..	..	..	..	..	..	
68 O.E.L.M. Girls' Industrial School, Gudur.	41	5,341	208	1,300	1,508	3,833	93	..	..	..	..	..	..	..	..	..	..	

APPENDIX III—cont.

Statistics relating to Government and recognized industrial schools for the year 1934-35—cont.

Serial number, name and place of institution.	Receipts from			Receipts and expenditure to the nearest rupee.					Non-recurring		
	Number on rolls on 31st March 1935.	(2)	Total recurring expenditure on new buildings and equipment.	Receipts from Government and other sources.			Recurring grants from other departments or public bodies.	Total recurring grant, add columns (9), (10), (11) and (12).	Balance of recurring cost met by managers' funds, column (7) minus column (13).	Expenditure on new buildings.	Equipment grant.
				Fees.	Bales.	Total, columns (4) and (5).					
			RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
ARMED SCHOOLS (GIRLS)—cont.											
69 Nazareth Convent Girls' Industrial School, Ottacamund.	27	7,463	..	2,196	2,196	5,267	195	900	..	4,367	..
70 Leipzig Mission Women's Industrial Home, Mayavaram.	31	10,790	..	3,386	3,386	7,404	239	1,500	..	5,852	..
71 R.C. Lace School, Vada-kangulam.	48	2,888	..	294	294	2,594	54	500	..	2,049	..
72 Hindu Girls' School, Kudangulam.	35	2,682	..	301	301	2,381	68	350	..	1,807	..
73 Holy Cross Convent Industrial School, Tuticorin.	94	7,643	..	3,187	3,187	4,456	47	1,000	..	3,056	..
74 Methodist Mission Lace and Embroidery School, Karur.	8	..	..	1,22	..	..	..	792	..	..	..
75 Holy Cross Convent Industrial School, Trichinopoly.	62	6,315	..	1,755	1,755	4,560	73	800	..	3,484	..
76 Sacred Heart Convent Industrial School, Anjengo.	41	2,603	..	31	31	1,972	48	400	..	564	..
77 St. Vincent Girls' Industrial School, Calicut.	39	3,703	..	58	58	3,645	93	..	..	3,645	77
78 St. Thomas Convent Industrial School, Mysapore.	29	7,145	..	2,253	2,253	4,892	169	..	..	4,892	..
79 St. Anne's Industrial School, Rayapuram	25	2,620	..	19	19	2,601	104	..	..	2,601	242

APPENDIX IV.

Statistics relating to recognized industrial schools for the year 1934-35.

Serial number and name of the institution.	Subjects in which instruction is provided.	Number of students who passed out in each subject.		Particulars as to the after-care of passed students.	Approximate total value of work turned out.
		(3)	(4)		
(1)	(2)				RS. A. P.
ARMED SCHOOLS (BOYS).					
1 A.A.M. Industrial School, Katpadi	(a) Carpentry and cabinet-making, (b) blacksmithy and motor mechanics and (c) carving.	..	..	..	2,500 0 0
2 Anjuman Industrial School, Vellore	(a) Cabinet-making and (b) freehand outline drawing.	(a) 2, (b) 4	..	(a) One employed as piece-worker and the other undergoing training at Tindivanam mart.	7,891 0 0
3 Anjuman Industrial School, Melvisharam.	Cabinet making	..	..	They have opened furniture mart.	2,211 0 0
4 Anjuman Industrial School, Tirupattur.	(a) Cabinet-making and (b) drawing	..	..	..	132 10 0
5 Don Bosco Industrial School, Vellore	Carpentry and cabinet-making	..	..	..	2,459 0 0
6 St. Joseph's Industrial School, Tindivanam.	(a) Carpentry and cabinet-making and (b) smithy and fitting.	(a) 11	..	All are employed	16,700 0 0
7 Danish Mission Industrial School, Panruti.	(a) Cabinet-making and (b) cotton-weaving	..	..	..	10,271 0 0
8 C.S.M. Agricultural School, Chingleput	Agriculture and allied trades	..	..	Eight are employed	838 0 0
9 A.A.M. Industrial School, Valacheri, St. Thomas Mount.	Cabinet-making	..	..	One is employed	1,945 0 0
10 St. Joseph's Industrial School, Coimbatore.	(a) Carpentry and (b) fitting	(a) 18, (b) 7	..	All are employed	63,000 0 0
11 London Mission Weaving School, Erode	Weaving and dyeing	..	..	..	3,467 0 0
12 F.S.G. & Sons Charity Industrial Institute, Peelamedu.	(a) Mechanical engineering, (b) electric wiring, (c) carpentry and (d) weaving.	(a) 5	..	Three are employed in local mills and two are working in the workshops.	1,675 0 0
13 Raja's Industrial School, Parakkimedi	Carpentry and cabinet-making	..	..	All are employed as teachers in the industrial schools.	2,232 0 0
14 C.B.M. Industrial School, Samalkot	Do.	..	..	..	26,674 0 0
15 U.L.C.M. Rural Reconstruction School, Guntur.	Agriculture and allied trades including weaving	..	..	..	..
16 American Mission Cabinet-making School, Guntur.	Carpentry and cabinet-making	..	..	Working as improvers	2,592 0 0
17 Commonweath Trust Engineering Classes, Mangalore.	Mechanical drawing and workshop	24	..	..	..
18 Sri Krishna Pataramalayam Industrial School, Kavutaram.	(a) Carpentry and (b) mechanical drawing and freehand drawing.	..	..	..	600 0 0
19 C.M.S. Industrial School, Vidyanaagar	(a) Leather work and (b) agriculture	..	..	..	1,298 0 0
20 St. Joseph's Industrial school, Gunadala.	Cabinet-making and blacksmithy	..	..	Seven are employed	7,680 0 0
21 Municipal Technical Institute, Masulipatam.	Mechanical engineering and electrical engineering.	11	..	..	13,478 0 0
22 C.N.T. Institute, Vepery, Madras	(a) Mechanical engineering, (b) minor electrical engineering, (c) electric mechanic class, (d) electric wiring, (e) carpentry, (f) fitting, (g) oil-engine driving, (h) motor driving and (i) printing.	(a) 31, (b) 19, (c) 28, (d) 5, (e) 2, (f) 5, (g) 4, (h) 1, (i) 1	..	(a) Two are employed, (b) to (i) one in each employed.	6,809 0 0

Statistics relating to recognized industrial schools for the year 1934-35—cont.

Serial number and name of the institution.	(1)	(2)	(3)	(4)	Approximate total value of work turned out.
AMEND SCHOOLS (BOYS)—cont.					
23 Anjuman Industrial School, Madras ..		Carpentry, carpet-weaving and tailoring ..	..	..	RS. A. P. 6,256 0 0
24 Orr's Assisted Industrial School, Madras.		(a) Mechanical engineering, (b) workshop theory and practice, (c) machine-drawing, (d) scientific instruments making and jewellery.	Each pupil is given five years, course.	After training they are employed in the workshops.	all
25 Ramakrishna Mission Industrial School, Mysore.		(a) Mechanical engineering, (b) automobile engineering, (c) applied mechanics and (d) smithy.	(c) 2 ..	All are employed	1,800 0 0
26 Sri Ram Motor School, Madras ..		Motor-driving and mechanism ..	....	....	2,800 0 0
27 The Penitentiary, Madras ..		Cabinet-making ..	....	....	26,812 0 0
28 Pasumalai Trade School, Pasumalai ..		(a) Printing, (b) carpentry, and (c) general mechanics.	(a) 4, (b) 3, (c) 3	..	6,510 0 0
29 C.S.M. Industrial School and Dindigul ..		(a) Carpentry and cabinet-making, (b) black-smithy and (c) tailoring.	(a) 10 ..	Four are employed	16,700 0 0
30 St. Joseph's Industrial School, Ootacamund.		Cabinet-making ..	....	....	1,200 0 0
31 St. Therese's Industrial School, Salem ..		Woodwork ..	....	....	8,753 0 0
32 St. Francis Xavier's Industrial School, Tanjore.		(a) Cabinet-making and (b) weaving ..	....	....	13,101 0 0
33 St. Mary's Industrial School, Kumbakonam.		(a) Cabinet-making, (b) smithy and (c) rattan work.	....	....	746 0 0
34 Municipal Industrial School, Kumbakonam.		(a) Cabinet-making and (b) weaving ..	....	....	..
35 Borstal School, Tanjore ..		Cabinet-making, weaving, tailoring, smithy and binding.	....	....	..
36 S.P.G. Art Industrial School, Nazareth ..		(a) Carpentry and cabinet-making, (b) blacksmithy, (c) motor-car driving and mechanism and (d) tailoring.	(a) 8, (c) 3, (d) 4	All are employed	11,168 0 0
37 St. Joseph's Industrial School, Adaikalapuram.		Carpentry and weaving ..	....	....	2,784 0 0
38 C.M.S. Industrial School for the Blind, Palamcottah.		Carpentry, weaving and rattan-work ..	....	....	5,322 0 0
39 St. Ignacius Industrial School, Tuticorin..		Cabinet-making and carpentry ..	3	..	1,331 0 0
40 Arabian's Industrial School, Arunagani.		(a) Carpentry, (b) tailoring and (c) sewing ..	..	..	187 0 0
41 St. Joseph's Industrial School, Tiruchopoly.		(a) Metal work and trades and (b) cabinet-making.	(a) 5, (b) 3 ..	All are employed	33,584 0 0
42 Methodist Mission Industrial School, Karaikal.		(a) Carpentry, (b) blacksmithy, (c) rattan-work and (d) cotton-weaving.	1 ..	..	22,064 0 0
43 All Saints Industrial School, Pettur ..		Cabinet-making ..	6	..	8,200 0 0
44 The Vikram Cottage Industries School, Madras.		Brass foundry, carpentry and bee-keeping ..	..	..	198 0 0
45 The South Indian Community Training School, Mayanur.		(a) Agriculture and allied trades and weaving, spinning and cloth-making.	..	..	100 0 0

AIDED SCHOOLS (GIRLS).

No.	Establishment	Work	Number of persons employed	Sex	Married	Age	Education	Religion	Other
46	Danish Mission Industrial School, Keelur, Tirukoyilur.	(a) Lace-making and (b) embroidery	10	..	..	..	..	..	..
47	St. Joseph's Convent Industrial School, Bellary.	Lace-making, embroidery and general needle-work.	6	..	..	..	..	..	..
48	C.S.M. Lree School, Chingleput	Lace-making	39	..	..	..	..	..	..
49	Methodist Mission Industrial School, Ikikadu.	(a) Lace-making, (b) embroidery, (c) weaving, (d) general needle-work and lacquer work.	3	..	..	..	..	..	..
50	St. Anthony's Industrial School for Girls, St. Thomas Mount.	(a) Embroidery, (b) needle-work, (c) dress-making, (d) tape-making, (e) mending, (f) ratta-work and (g) raffia work.	(a) 6, (b) 3, (c) 3	..	..	..	..	..	..
51	A.A.M. Women's Industrial School, Palmaner.	Needle-making, embroidery, general needle-crafts, and dress-making, child care, home nursing and hygiene.	39	..	..	..	..	..	..
52	London Mission Girls' Industrial School, Brode.	Mat-making, basket-work and weaving	3	..	..	..	..	..	..
53	Methodist Mission Industrial School, Dharampuram.	Embroidery	..	..	..	..	..	..	..
54	Immaculate Conception Convent, Coimbatore.	Embroidery, general needle-crafts and dress-making	..	..	..	..	..	..	..
55	St. Joseph's Orphanage Industrial School, Coimbatore.	Dress-making and general needle-crafts	7	..	..	..	..	..	..
56	St. Anthony's Industrial School, Kilpauk.	(a) Embroidery, (b) general needle-crafts and (c) dress-making	(a) 29, (b) 15	..	..	..	..	..	..
57	Madras Seva Sadan Industrial School, Chetput.	(a) Embroidery, (b) needle-work and dress-making, (c) ligna works, (d) lacquer work, (e) making of lamp shade and (f) cane work.	(a) 3	..	..	..	..	..	..
58	St. Bridget Industrial School for Girls, Nungambakam.	Embroidery and general needle-crafts	..	..	..	..	..	..	..
59	St. Joseph's Industrial School, Madura	Do.	13	..	..	..	..	..	..
60	The Commonwealth Embroidery School, Calicut.	Embroidery, lace-making and needle-work	10	..	..	..	..	..	..
61	O.E.L.M. Girls' Industrial School, Oudur.	Lace-making	..	..	..	..	..	..	..
62	Nazareth Convent Girls' Industrial School, Coimbatore.	Dress-making, embroidery and general needle-crafts and tailoring.	..	..	..	..	..	..	..
63	Leipzig Mission Women's Industrial School, R.C. Lace School, Vaddakkangulam	Cotton-weaving, mat-weaving, basket-making and general needle-work.	..	..	..	..	..	..	..
64	R.C. Lace School, Vaddakkangulam	Lace-making, embroidery, general needle-crafts and sericulture.	..	..	..	..	..	..	..
65	Hindu Girls' School, Kidangulam	Lace-making	..	..	..	..	..	..	..
66	Holy Cross Convent Industrial School, Tuticorin.	Lace-making, embroidery and dress-making	..	..	..	..	..	..	..
67	Methodist Mission Lace and Embroidery School, Kurur.	Lace-making and embroidery	..	..	..	..	..	..	..
68	Holy Cross Convent Industrial School, Trichinopoly.	Embroidery, general needle-crafts, lacquer work and cooking.	2	..	..	..	..	..	..
69	Sacred Heart Convent Industrial School, Angengo.	Lace-making, embroidery and dress-making	..	..	..	..	..	..	..
70	St. Vincent Girls' Industrial School, Calicut.	Dress-making, embroidery and knitting.	..	..	..	..	..	..	..
71	St. Thomas Convent Industrial School, Mylapore.	Dress-making and embroidery	..	..	..	..	..	..	..
72	St. Anne's Industrial School, Rayapuram.	Cotton-weaving	..	..	..	..	..	..	..

