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REPORT OF, THE

INDUSTRIAL SURVEY

OF

TRAVANCORE.

S. G. BARKER, PH. D., D. I. C.

TRIVANDRUM:

PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS
1919.

X9.222.N17t4

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REPORT
OF WORK OF
INDUSTRIAL SURVEY DEPARTMENT
FOR 1917—1918.

The Department opened on the 1st Makarom 1092 and has been in existence 1 year and 11 months. The Industrial Survey of the State was a heavier task than at first anticipated, but now the work is completed and every Taluk has been visited with the exception of the High Range, for which time and opportunity have not presented themselves. This, however, will be done in the near future. The report, however, is submitted and the particulars of detailed information kindly furnished by the Commissioner. The other Taluk reports are records of personal observation and facts gained from all sources. I should like to acknowledge at the outset, the help rendered by all the Tahsildars in my work.

The method of working the Survey was to proceed to each place and conduct an Industrial Conference of the leading citizens and ryots. An Industrial Development Committee of 3 members was secured in each Pakuthy of the Taluks whenever necessary and possible. These gentlemen were asked to fill in the printed inquiry form (in Vernacular and English), and after some time, I visited the place myself and confirmed their statistics, found new ones and corrected mistakes etc. In every Pakuthy there was no lack of willing helpers and except in one or two cases the work was done faithfully and well. In most cases each Pakuthy was visited and investigated separately, and, throughout the report, detailed Pakuthy statistics are frequently quoted. My work has been greatly helped by the Tahsildars and their subordinates who were ever ready to render aid, and by the Assembly Members who always rallied to my side with advice and assistance. My staff consisted of one clerk on Rs. 30 and one Typist. I was fortunate to secure two men who have worked loyally with me. My best thanks are due to Messrs. S. W. Fletcher B. A. and C. R. Thompson. In

July 1917 Government generously placed at my disposal the services of a Chemical Assistant on Rs. 100 for analysing specimens and working out processes. Mr. Kerala Varma Thirumalpad B. A. was appointed and he too has worked hard and well. The reports of analysis &c. are due to him. My main work has been the study of the Industries of the country impartially from all stand-points. Industrial success and failure, thriving and defunct Industries were all investigated. In April 1917, Government entrusted to this Department the work of arranging for the four foreign Technical Scholars to proceed abroad. These students were found places in the best Institutions in England. The four gentlemen selected by Government proceeded on August 8th from Colombo, and landed safely in England and took up their duties in October. Mr. Padmanabha Menon B. A. is studying Chemical Industry in the Imperial College of Science and Technology, London, and has passed his Inter. B. Sc. (Eng.) of London University. Mr. Padmanabha Pillai is studying Weaving and Dyeing at Leeds University and has secured the Bronze Medal of the City and Guilds Institute, London, for dyeing. Mr. Abraham George B. A. studies Leather and Tanning in London. Mr. C. Kumara Das B. A. is in Liverpool studying drugs and soap-manufacture. Besides these Mr. P. N. Vridachalam B. A. was sent to Bangalore, Indian Institute of Science, at Government expense to study "Wood Distillation" and Mr. S. Narayana Iyer B. A. proceeded to Jhalda in Orissa to study Shellac manufacture. He has now returned and Government has sanctioned his appointment for one year to investigate the State's possibilities in this direction. With a view to further encouragement of Industries, I was able to secure a place for free training in Pencil Manufacture at the Government Factory, Madras, for Mr. R. N. Krishna Pillay, a free place for Button Manufacture for another student Mr. J. Rosario and for Messrs. J. Fenn and P. T. John free places for learning bee culture and bees-wax manufacture. Government have now sanctioned a scheme for demonstration of this Industry, and the work is already commenced in Nedumangad and Trivandrum. Another student was sent for Candle making, and we are able to direct others into various Institutions. Large numbers of applications for Industrial Training were received, but a good S. S. L. C. Certificate was required as the minimum qualification before any arrangements were made. The last four students proceeded at their own expense, but free training was arranged for them,

This work was done to provide suitable experts for Travancore Industries. During the period we have issued 17 Bulletins in the Government Gazette on various Industrial topics and these appeared in English, Malayalam and Tamil. The great demand for them and the recent enquiries have demonstrated the utility of this work. The following is the list of Bulletins.

1. Some Indigenous Dyestuffs of Travancore.
2. The Shellac Industry and its possibilities in Travancore.
3. The Lace Industry in Travancore.
4. The Varnish Industry and the extraction of scents and perfumes in Travancore.
5. The Alkaline deposits in South Travancore.
6. Lemon Grass Oil.
7. Kaolin deposits in Kumbalam.
8. Tapioca Flour.
9. Elephant Aloe fibre.
10. Button and Bangle making from Shank Shells.
11. Leather and Tanning.
12. Toys and Toy making in Travancore.
13. Gold and Silver Lace Thread.
14. Pencil Manufacture.
15. Bleaching and Dyeing of Coir Fibre.
16. The Palmyra Industry in Travancore.
17. Note on the extraction of Dye from *Mallotus Philipinensis*.

Lectures on Industries have been delivered in all parts of the State and in the two years over 50 addresses have been given. Two reports have been prepared.

(1) A detailed report for each Taluk taken separately showing the Educational, economic, and Industrial features of each place separately and in detail.

(2) Reports of particular Industries taken separately.

Under the former heading, details of Schools, Co-operation, Capital wages, natural resources, defunct, existing, and possible Industries are given fully. Suggestions for future development are also given. The report endeavours to show the separate treatment to be accorded to each Industry and the way to develop it. In this regard, it would be best, if the report is accepted by Government, and if three or four Industries were selected and attention concentrated on the development of these alone. Shellac, Tapioca, Coir, Palmyra, Sugar,

Matches, Soap, Pencils, Weaving and Dyeing, Brushes, Mat and Basket weaving are amongst the most urgent, and, if some of these were worked out fully, then, others could be taken up in turn. A few Industries worked to a successful issue will be the best policy as it will inspire confidence in the people for further enterprises. In the last two years we have received over 3,000 letters of enquiry etc., and we have sent out over 2,500 in reply. These are in most cases full reports of particular questions and have entailed considerable work. We have given advice in over 800 cases in Industrial matters.

The practical work undertaken by this Department has necessarily been small, as the main work has been the Industrial Survey, but, nevertheless, the work has progressed favourably. In this regard, I am indebted to my Chemical Assistant and to the Professors and Demonstrators of His Highness the Maharajah's College, who have helped me considerably. I am also indebted to various firms and people throughout Travancore who have willingly undertaken experiments at my suggestion. I will enumerate some interesting points in the work that has been done.

1. *Work with fibres.* (a) *Coir fibre.*—Bulletin No. 15 records the results of experiments in the dyeing of cocoanut fibre with indigenous dyestuffs to obtain green, black, red and maroon colour. These processes were worked out in detail as was also the bleaching of cocoanut fibre for both fine and thick fibres. Recently, our attention has been engaged on the construction of a machine for the extraction of coir fibre from the husk without the labourious method of beating and soaking. In this, it is premature to state that, we have been entirely successful, but a machine has been made which consists, essentially, of a large drum 2 ft. 6 in. in diameter and 18 in. broad. The drum is covered with small boards 2½ in. wide and these are fixed round the drum by two circular iron bands. These boards are full of spikes numbering 13 and 14 in alternate rows. The lateral distance between these spikes is 1¼ inch and the vertical distance is ¾". The whole is shortly rotated by means of two cog-wheels geared together and turned by a handle. The husks are first split up and soaked in water for 24 hours. They are then pushed between two rollers so that they come against the spikes. The latter split away the foreign matter and dirt, and the clean fibre can be withdrawn by the hand. It was

found that the fibre so produced could be sold for Rs. 20/ per cwt. and the rejected portion for Rs. 5/ per cwt. This machine is being improved upon, and it is hoped that it will greatly assist the ryots of those areas where water for soaking is impossible. Attempts have also been made with only partial success to soften the fibre and experiments in this direction are now proceeding.

(b) *Aloe-fibre*.—The development of the aloe fibre industry has been the concern of this Department and large orders for twine have been received from various places. In a single month over 40,000 yards of twine were sent out in reply to orders, and the industry is steadily progressing. Beltings, bags, and matting have all been made. We attempted to soften the fibre by chemical means in order that we could make a substitute for gunny bags. The fibre was boiled with coconut oil and alkali for three days and then came out with a soft texture. This was woven into a good cloth and finally a gunny substitute was obtained, but it would be rather expensive. Further experiments have yet to be carried out. Tent ropes and cordage have also been made.

(c) *Palmyra Fibre*.—Bulletin No. 16 records our work on palmyra fibre. We have worked out new processes for bleaching the fibre and also for dyeing it. Brush making has also engaged our attention and experiments performed.

(d) *Kyvan Fibre*.—We have lately taken up the study of the extraction of kyvan fibre and its use as a canvas or gunny substitute. Experiments have so far been encouraging.

(e) *Shencottah Hemp Fibre*.—The properties of this fibre are also under investigation and already successful weaving of bags has been done. The details of this work and also the manufacture of canvas substitute are recorded in the Shencottah Taluk Report.

(f) *Lotus Fibre*.—The extraction of fibre from the stem of the flower of the lotus-lily has been taken up and whilst fibre was obtained, it was not available in quantity and the cost of extraction was prohibitive.

(g) *Fibre from Sago-Palm*.—This fibre has been extracted in small quantities by fishermen on account of its tensile strength and utility for making fishing lines. Recently, other uses have been found for it and it is hoped that this industry can be built up in the future. Investigation is now proceeding.

(h) *Cotton*.—Investigations into cotton net making in South Travancore are recorded in the taluk reports. There are a great number of other fibres in the State which have not yet been fully investigated, and a list of over 40 trees has been prepared ready for investigation. This work has yet to be done and will be a long laborious task. Fibre of many kinds is available in the forests and the economic value of them is unknown. There is a great field for investigation in this direction.

2. *Iron Work*.—The manufacture of small iron goods such as scissors, knives, and rubber-tapping-knives has been encouraged during the last year. A small company was formed at Warkalay and the work was under the superintendence of Kochuminy Asari, a highly skilled blacksmith of the locality. During the year 1918, this small firm has made and sold through this Department 600 pairs of scissors, 500 Rubber-Tapping-knives, 150 Tapping Gauges, 200 Table-Knives, large numbers of pocket-knives, and 50 Pruning-knives. We have been able to keep the firm going with orders, for the whole year and we also sold over 2 dozen hollow ground razors made by them. This work was commenced by this Department, and all goods manufactured were inspected by us before despatch. We have now large orders in hand, and with careful guidance, the small industry is gradually growing. There is a good market for the goods and we hope to be able to improve upon them. One of the worst features of their manufacture was the fact that they were unplated and hence were liable to rust. A member of the firm is now to be sent to learn Electro plating at Trichur and we hope on his return to turn out a better class of goods.

No. 3 *Acetic Acid*.—Two problems have faced this Department during the last year. The first was the utilization of cocoanut Shell and the second was the production of Acetic acid for Rubber plantations for coagulation purposes. Annually, Acid valued at over 60,000 rupees is imported. We designed and constructed a still capable of turning out about 5 Gallons of Pyroligneous Acid per day and we utilised wood fuel with a mechanical blower. The still was made of iron and was designed to provide facilities for removing tar, and Charcoal, and for refilling with cocoanut shell. The total cost of the apparatus including the furnace and condenser was Rs. 160, and there is no doubt it could be made cheaper when raw materials are reduced in price.

The crude Pyroligneous Acid was then taken and found to contain many substances such as Methyl alcohol, Acetone, higher organic Acids, and tar. The crude liquid was redistilled and fractionated in a smaller still and condenser. Two fractions were taken. (1) Between Temperatures 87° c. and 98° c. This fraction contained almost all Methyl alcohol and acetone. 10% of the liquid distilled over in this. (2) Between temperatures 98° c—115° c. This contained all the acetic acid 85% of the liquid distilled over in this fraction. The residual tar being estimated at 5% of the original liquid. This tar was rejected.

The fraction between 98°-115° C was filtered over Charcoal four times, and sample A of acid was obtained. This contained 7.75% of acetic acid. It was redistilled with $\frac{1}{4}$ % potassium of its weight of potassium bichromate. The first runnings—measuring 2% by volume were rejected being slightly colored and impure. The next fraction was collected up to 115° C, at which temperature all the acid volatilised leaving a charred residue. The loss in this distillation is a negligible quantity. This pure sample was *colourless* and *practically free* from all aromatic substances and contained 10 per cent of acetic acid.

N. B. In place of Potassium bichromate, potassium permanganate also serves, but on actual experiment the former was found more effective.

The apparatus mentioned above was all made locally and is such that it could easily be set up so that each estate could have its own producing plant for coagulating liquid. Experiments are now being tried with the material, and, if it is taken up it will greatly help the rubber industry. It is specially important since a large number of Travancoreans are taking up the industry, and also the high price of acetic acid renders it difficult to carry on the work. In actual experiment 44 lbs. of shell yielded 7 $\frac{1}{2}$ lbs. of 10 % acid & 13 lbs. of charcoal.

4. *Dyestuffs*.—Bulletin No. 1 of this Department showed the resources of the State as regards dyestuffs. It has been the work of this department to investigate many of them but it is obvious that with only one man the research must be very slow. By the kindness and co-operation of the Professor and the Demonstrator Mr. Krishna Iyer M. A., of the Maha Rajah's College, we have been able to work out the dyes from the Mallotus Phillipinensis, orchil, indigo and sappan. Bulletin No. 17 deals with the Mallotus Phillipinensis exclusively and I would specially mention the work of Mr.

Krishna Iyer on Orchil. He has succeeded in producing a purple coloured dye from the leaves. The importance of this can be gathered from the fact that the Excise Department reports that quantities of this Lichen are sent out annually through the Aramboly Chowkey. The purpose of this was unknown, but it is now discovered that it was all for extraction of the dye. There is no lack of quantity, and this might be taken up commercially. However, further work is being done and attempts will be made to ascertain its market value. These will be the subject of a subsequent Bulletin. As regards indigo, it has been demonstrated that it will grow well in South Travancore, from Colachel to the Cape, and what is now required is the establishment of a proper scientific means of extraction of the dye. The field for research in this direction is a big one, and it is hoped that the return of the Government Scholar from England will greatly assist the development of the industry.

5. *Pottery and Porcelain.*—The work in connection with the development of pottery and porcelain has already been reported in our Bulletin No. 7, but much yet remains to be done. The deposit at Kumbalom was pure China Clay, but is too pure to make really successful porcelain, and admixture of felspar has to be made before it can be used. Nevertheless, we were able to make cups and saucers at the School of Arts, and also to make school chalks and blanco. We also were able to get in touch with firms willing to take it up, and already Messrs. Lakshmi Ratans are enquiring into the matter. It has been found highly suitable for Fire-Bricks, and also as a loading and sizing material for paper. The proximity of the paper pulp materials makes it possible to develop paper manufacture with local materials. It is hoped that our efforts will soon materialise into something substantial.

6. *Pencil Manufacture.*—Mr. R. N. Krishna Pillai has returned from Madras, and in order to enable him to have further training Government has allowed him Rs. 20 for six months. The question of local materials has also been taken up and supplies of graphite were analysed by the Indian Institute of Science, at the request of Rao Sahib M. Rama Row, of the Mysore Service. The report sent to us were most encouraging and we have already got a firm interested in the matter. As regards timber, we have investigated several Travancore woods, and it appears as though Kariinjotta and white Cedar

have the best properties for this purpose. We are awaiting the security of the supply of raw materials before we go ahead.

7. *Iron Ore*.—Samples of pyrites were taken and also samples of clay iron-stone and haematite. These were analysed and were sent to interested persons in Bombay. The reports from them had been satisfactory, and it is probable that further will be heard of this matter in the near future. Formerly, iron was extracted locally from the ores found in Travancore, and there is no doubt that quantities exist. The question of power for the extraction is a serious one.

8. *Tapioca Flour*.—Bulletin No. 8 of this Department contains fully our work upon this subject. We had considerable trouble in getting details of manufacture and also particulars of machinery. Nevertheless, by the kindness of friends, this was accomplished. Tapioca flour engaged our attention. We sent out specimens to Australia, France and America. Mr. Seligmann of Messrs. Hartmann Bros., Boston, U. S. A. owing to our efforts, visited Travancore, and we were able to fix up an order up to 20,000 tons of flour annually for America, which means over 60 lakhs of rupees for the State, if it can be supplied. The subject was worked up at Trivandrum and orders for 20,000 tons were found to mean 100,000 tons of root and an outlay of Rs. 100,000. We therefore engaged our attention on finding out cheaper means of extraction and succeeded in getting into touch with a Tapioca Planter in Java who was willing to sell us a full set of machinery directly the war is over. He states that he is willing to train a man in the use of the machinery and at present we are making arrangements with reference to this. In our bulletin we issued a word of warning regarding the development of this industry, and, that is, if we take up the manufacture of Tapioca flour, then we must also take up increased cultivation to meet the increased demand, otherwise we shall rob ourselves of a cheap foodstuff. The development of this industry is of importance to Travancore and if demonstration of cultivation and extraction could be done it would go a long way towards inspiring confidence amongst local capitalists.

9. *Lace and Embroidery*.—We are able now to do what is wanted with regard to the finding of outside markets and already have enquirers from Australia and from America for Travancore hand-made lace on a commercial scale. We have

been able to get into touch, through our bulletins, with big firms who are enquiring for these things.

10. *Bird-Lime*.—Through the kindness of C. A. Innes Esq. I. C. S., Director of Industries, Madras, we were requested to experiment with the manufacture of bird-lime from the *Cordia myxa*. The early experiments were conducted in Quilon and the report by Mr. Innes was encouraging. We now have obtained the proper method of manufacture, and are awaiting the ripening of the fruit next season to carry out further experiments.

11. *Plantain Fibre*.—The extraction of plantain fibre and the development of plantain industries have also been receiving attention, although we have not been able to do very advanced work. A small machine was designed and was made locally, and now a better one is in course of manufacture. The question of the market value of the fibre was also gone into carefully, and it was found that £.24 per ton could be obtained in Europe. We also investigated a method for softening the fibre so as to produce an imitation silk. In this we were successful and it was found that if the fibre was boiled with cocoanut oil, ammonium carbonate and sodium carbonate, that softened to a consistency of silk. This was used for weaving and an excellent cloth made. Further work on this subject is necessary and is being attempted.

12. *Varnish*.—It would be impossible to estimate the value of the resins of Travancore from the standpoint of varnish manufacture. We have investigated the manufacture of varnish from the resin of the Travancore Pine, and Dammar, and Mr. Sitarama Iyer, has investigated the *Hardwickia pinnata*. The method of extraction of the resin for *Hardwickia pinnata* varnish consists in steam distillation of the Oleo-resin, and Bulletin No. 4 has dealt fully with Travancore Pine varnish. All the experimental work was done by this department. The varnish industry could well be introduced at Quilon or some place equally central.

13. *Soap Manufacture*.—During the year, we have tested the various oils with a view to their saponification and we have also tested mixtures with the same object. One of the problems before us is the deodorising of fish oil and its manufacture into a good soap. Two processes were tried. First, the refining of the oil, and second its manufacture into soap.

Two samples of local fish oil were taken, and they could be distinguished by their characteristic physical properties set out below :—

	A.	B.
Colour.	Yellow.	Dark Red.
Sp. Gravity.	0.9242.	0.9256.

Process.—Both oils contained fleshy matter, the removal of which was effected by allowing the oil to settle down and then the upper layer removed by decantation. The supernatant oil was passed through a clean cloth so as to remove the impurities and the filtrate was shaken with finely powdered China clay. The object of this procedure was that some of the colouring matter, as well as impurities that escaped the filter might adhere to the clay and be eliminated. This mechanical process of refining was partially successful but as impurities still remained, it had to be further treated chemically.

One of the hindrances to the utility of fish oils is their offensive odour and another is their colour. The former can be removed by distilling it in steam with deodorising substances, such as charcoal. The samples given were boiled with powdered charcoal and chalk, amounting to 10% of the weight of the oil, in a current of steam for an hour. It was then allowed to settle down and filtered. The mixture of oil and water was separated by decantation after keeping it for a day. The oil floated on the top, was drawn off and dried, in this case, by anhydrous sodium sulphate, but the drying agent can be ignited "Plaster of Paris". It was, then, filtered and stored. All edible fish oils can be treated in this manner, for, in such oils, the use of chemicals must be avoided as much as possible.

A second method that is applicable to fish oils is by boiling with well-powdered tannin materials, such as the barks of Konna, and Avaram, in steam. The lighter coloured oil "A" was treated in this way in the laboratory, and lost much of its colour and odour. The object of this treatment was to remove the albuminous matter contained in the oil, which would be a source of trouble, if the oil is to be used for soap making and other things. The method of purification was as follows :—

The oil was mixed with 6 % of its weight of tannin and was heated in steam, and the oil became less offensive in smell,

Within three days, the oil separated from the water, and was drawn off into a vessel. It was mixed with a solution of lead acetate. This removed any tannin contained in the oil. It was again separated and dried as before and finally filtered. By this treatment the specimen A of the oil was purified, but the same treatment did not work well for the sample "B".

Fish stearine 25% is mixed with pinna oil 25% and coconut oil 50%, and the mixture is warmed to 70 degrees C. The mixture is allowed to settle, and, while warm, the clear liquid is removed and the sediment (1% of the mixture) is rejected. It is only the burnt portion of the animal matter and is of no practical value.

The saponification value of the mixture is 159 so that 15.9% alkali is required for saponification.

The cost of materials may be summarised as follows—

	Rs.	As.	P.
1 lb. Fish stearine	...	...	2 ...
1 lb. Pinna oil	...	...	2 3 Retail.
2 lbs. Coconut oil	...	...	4 6 do.
$\frac{1}{2}$ lb. Caustic soda	...	...	8 . do.
$\frac{1}{4}$ lb. Soda ash	...	...	6
Total.	1	1	3

Finished Soap = 8 lbs.

The value per pound of soap comes to 2 As. 2 P. Working charges may be estimated at 4 pies per pound at the most. The cost price of soap is 2 as. 6 p. per lb. The estimate is prepared by taking retail prices, but on a large scale, the cost of 1 lb. of soap will be less than 2 as. a pound.

Lemon grass oil is the best local scent for ordinary soaps, but oil of cassia, oil of bitter almonds, and carbolic acid may also be used.

Cheaper soaps may be made by loading real soap with china clay to the extent of 25 to 30%

The boiling is completed when the temperature of the soap solution reaches 105–110 degrees C. The boiling will be complete in three or four hours time.

We have been asked, recently by a great number of people, to publish a bulletin on soap manufacture, and we find, throughout the State, a great number of people who state that they can make soap. They forget that soap manufacture is essentially a scientific process, and unless it is worked on strict chemical and scientific lines it cannot hope to succeed because the public confidence cannot be secured as to its uniform standard of quality and cleanliness. Before soap making is attempted on a commercial scale, a proper training is essential, and it is only after the maker has become expert in a good factory that he should attempt the business for himself. Arrangements for such training are now being made at the Calicut Soap Factory and it is hoped that aspirants to become soap makers will avail themselves of proper training.

If trained men could only be available and the capital which is now being wasted on inefficient experiments utilised properly by them, then the soap industry could be very successful in Travancore.

14. *Lemon-Grass Oil*.—During the last year we took up the question of Lemon-grass-oil Distillation with a view to the revival of the industry in Travancore. We first investigated the various causes of the decline of the industry and found that they were :—

1. Crude methods of preparation involving a very impure finished product.
2. Adulteration with water and oil.
3. Low Citrol content, due to inefficient distillation.
4. The presence of resinous matter and dirt.

We found that a good market still existed for the pure oil and the impurity was chiefly due to the ignorance of the workers. It was, therefore, at this point we started our practical work, and it was found that by Steam Distillation the oil could be purified. In order to test the market we purchased oil in Central Travancore and redistilled. This oil found a ready sale, and not only was a market found in India but also in America. We published a bulletin on the subject and the result of our work was that a firm in Alleppey and one with branches in both Alleppey and Cochin both made enquiries to take up the work of redistillation. We were able to get a fair quantity of the oil redistilled by

Dr. Sudborough in Bangalore, and a special still was designed in the Indian Institute of Science, Bangalore, to do the work on a commercial scale. This Still is now being made in Madras. This is a brief record of the work done on this subject.

15. *Alkali from Plantain Skins.*—We were anxious to see if there was any possibility of obtaining cheap alkali from plantain and banana skins which could be used for any commercial purpose and the results of our experiments were satisfactory. However, it should be noted that the chief difficulty is the collection of the skins in sufficient quantity to make the business worth while. The results of the experiments on the ash of the fruit skin after ignition are appended below :—

Sun-dried skin gave 11% of its weight of ash after burning and of this 34.4% was found to be soluble in water. This percentage of soluble material contained 22.6% of potassium carbonate, 2% of sodium carbonate and the residue was sulphite, chloride, and silicate of potassium and sodium. On examining banana ash, it was found that 10% by weight, was left after ignition, and that nearly 86% of this ash was soluble. 51.8% of the ash was found to be potassium carbonate and the remainder was made out, as before, in the case of plantain. This analysis is useful as showing the possibility of alkali production if the skins could be obtained in quantities.

16. *Kuft-gari Work.*—During the last year, we have been able to secure large orders for kuft-gari work, which have been placed entirely with local artisans. It should be possible to develop this industry greatly as also that of ivory carving which we have also assisted to a great extent. Proper organisation and capital are all that are required.

17. *Investigation of Alkaline Deposit.*—The alkaline deposits discovered at Tengampudur were fully investigated, and a bulletin published on the subject.

Besides all these experimental work, we have obtained orders for over 3,000,000 sq. feet of palmyra and bamboo matting, large numbers of ropes, sealing-wax, pen-holders, baskets, rattan work, iron work, and numerous other things. We were able to get outside firms in touch with Travancore weaving institutions, and also for leather-goods, to obtain button machinery and find markets for many varieties of

goods. On the practical side, we are now engaged in various problems, and amongst these can be mentioned the production of alcohol motor fuel, the use of glucose in printing for rollers, basket making, outside markets for lace and embroidery, shellac, and apiculture. With reference to the latter, we have already secured markets for all the bees-wax and honey that we can produce for a term of years. A brief note on our work in bee-keeping will be useful.

18. *Apiculture*.— A cocoanut tree was taken and sawed into logs 2 feet long. These were then hollowed out and boarded over both top and bottom. Small holes were made to allow for the entry of the bees and these have been attached to trees in Trivandrum and at Nedumangaud. The idea is that the bees will fill these hollow logs with honey and take up their abode inside. After two or three months they will be transferred to hives and the business of bee-keeping properly started. We intend to give instruction to local people in the business and introduce it as a cottage industry. Government has appointed an expert, and he will be in control of the central apiary at Nedumangaud, and after the demonstration is working successfully there, it is hoped that he will be able to open out in other districts also.

With regard to shellac, Mr. Narayana Iyer, B. A., who has been trained at Jhalda, has begun his work in the forests of the Southern Division near Aramboly, where lac has been observed oozing out of the trees. A chart showing the main localities for the growth of lac bearing trees has been drawn up, and seeds have been ordered from Pusa so that practical tests can be tried on various trees in different places in the State. After a year of observation, we shall be in a position to know the best lac producing district, and the most suitable place to open out a factory.

With regard to matches, the experiments in the manufacture of palmyra leaf boxes have been successful, and the utilisation of the cadjan central stalk has also been demonstrated. There are, however, some objections to the use of these stalks, *i. e.*, they are of uneven thickness and they are of low inflammable qualities. By impregnation with resin they have been made to burn freely, and they are unaffected by them. Split bamboo has also been used successfully, and many varieties of soft wood are available. The chief difficulty is to get the necessary machinery and chemicals, and Messrs. Brunton & Co., of Cochin, have signified their intention of opening out the industry as soon as it is possible.

Bamboo furniture has also been introduced on a small scale, and the manufacture of walking sticks, bent-wood chairs, etc., are all receiving attention and being developed. Punkah Candle sticks, and enamel ware, are being attempted, and are badly in need of help. We hope to render this help as soon as time permits. This completes a brief record of some of the practical work done by this department in the last two years, and in the future, with Government permission we hope to go much further and deeper into research work on Travancore Raw Materials. I will now turn to a discussion of the outlines of industrial progress for the future.

PROBLEMS AND POLICY.

Under this heading, I propose to discuss the general problems facing Industry in the State rather than the Scientific or other demands of any one industry. The following are the points which I would like to submit to Government for consideration.

1. Exhibitions, local and otherwise.
2. A Commercial and Industrial Museum.
3. Associations for Industrial discussions.
4. Co-operation.
5. Roads and transport.
6. Advisory Board.
7. Industrial conferences.
8. Banks (Land and Industrial) Capital.
9. Grants, Loans, &c.
10. Technical Examinations.
11. Bulletins.
12. Cottage Industries.
13. Power.
14. General Remarks.

1. *Exhibitions*.—During the course of my work, I have visited several Exhibitions. These local Exhibitions are institutions to be greatly encouraged as they have a considerable educational value. To see the hundreds of people who visit them is sufficient guarantee of their utility. The practice of giving lectures on definite subjects of an instructional character is also to be commended. There are several points, however, which I wish to put forward in connection with these functions. The chief fault is that the exhibits are not sufficiently local in character. The Department of Agricul-

ture, the Forest Department, the Industries Department are all rightly represented; but purely local artizans do not show their goods. The best weaving in the District, the best local paddy, the best cocoanuts, the best coir, the best carpentry, the best blacksmithery should all be awarded prizes, and it would encourage local artizans, if competition in these classes was limited to the locality. Outside exhibits should certainly be included, but the primary object should be to give a stimulus and good example to the local artizans of the neighbourhood where the exhibition is held. I noted, at one place, many exhibits from outside Travancore, and a minimum of local articles. These local classes of competition would do much to improve the quality of work of the village artizans as well as give encouragement for local cottage industries. Exhibitions should be held annually, and the more the places which hold them, the better it will be. They are certainly an institution that should receive every encouragement, and their value can not be over-estimated. Small grants should be made by Government to assist these exhibitions and a Rs. 1,000 might be set aside for the purpose. These functions would be made the occasions for demonstration of new processes and machines and also for encouragement and introduction of growing new industries. Exhibitions if well organised, serve a very useful purpose. The incitement of local competition must be one of its objects as well as the exhibition of the best and latest things from outside. Local goods can also receive advertisement here and the public given an opportunity of estimating their value.

2. *Commercial Bureau and Industrial Museum.*—I have already referred to this at length in my suggestions for the organisation of cottage industries and their relation to a Central controlling agency; but I again briefly mention the fact as I consider it of importance in a review of Industrial organization. The bureau must be the controlling centre of all depots and responsible for markets for goods etc. In order that the goods of the State may receive adequate advertisement a Museum should be founded, maintained and kept up-to-date. It should be fully representative of every industry in the State, and should have a well-got-up Catalogue. This catalogue should be sent out broadcast to all parts of the world. The price of the goods, the particular quality, the name and address of the maker and illustration should be included if possible. The Museum would be able to supply samples according to pattern, to recommend mar-

kets for goods, and to find makers for goods ordered. It should, in short, be the advertising bureau of the State's industries. If a particular article is required, a reference to the catalogue will give the details of the Firm and the price. This record must be an annual one and must be kept up-to-date. If my proposal regarding the School of Arts reorganization is accepted, an extra staff of Clerical workers would be involved and the location of the Museum could be in the school building. One point must be borne in mind, the bureau and Museum must be of ready and free access to the Public and must be kept fully stocked and up-to-date. A sum of Rs. 1,000 annually would be more than ample for all purposes, if the above proposals are sanctioned. The essential points are that the bureau must be under the direct control of the Industries Department and in direct touch with the Cottage Industries Depots and the various Industries.

The Commercial Intelligence Bureau must also be in the Industries Department and must carry on the work that is at present being done by myself and staff. In reality no change of method would be made, but the public at large would know of the existence of an enquiry agency where information regarding raw materials, markets, etc., could be given.

3. *Industrial Associations.*—Throughout the whole of Travancore, Literary Associations abound and those bands of young men do an immense amount of good in literary matters. The establishment of Industrial Associations to encourage the youth of the State, to discuss Industrial Problems, and generally improve their knowledge of Industrial Processes, should be encouraged. Much good work can be done, if Headmasters of schools encouraged these meetings. The Industrial Schools should become the centres of these activities. If a few young men were to meet and discuss intelligently new processes in Agriculture or learn the latest processes in particular industries, these associations would help forward industrial progress greatly. They could be a great power in industrial matters and their services could be utilised for demonstrations and introduction of new methods of Agriculture and Industry.

4. *Co-operation.*—A point that was striking in the course of my survey was that when conversing with the people, one was impressed with their ignorance of true co-operation. A great majority of the people regard it merely as a bor-

rowing agency or a means for easy credit. The members of societies now existing are in many cases the very antithesis of co-operators. There must be a spirit of mutual trust, fellowship, and a desire to help one another, but these are largely absent. At present, one finds every man is living individually and alone with no co-operation with his neighbour or fellow-worker. The solution of the problem of finding capital for cottage Industries lies largely in co-operation. Weaving and basket making are particular examples. It would be useless to supply an initial grant and then leave the society to carry on. It would be better if one or two pattern societies were developed as models and the spirit of these societies be gradually spread. Working alone, individual workers often find their calling impossible, *e. g.*, weavers cannot afford individually to buy in large stocks of yarn at a cheap rate. If they unite and co-operate, whilst each man retains his own business, yet together they can buy yarn at a cheaper rate, and thereby enhance each man's earnings. "Working Together" is the spirit to be cultivated and this is not yet realised by the vast majority of our workers. These societies would pay if properly run, but one must run a co-operative business and not a charity. Capable managers and actual business-men must control the affairs for the members. Co-operation will do much to help forward industry, if only a true co-operative spirit is created and fostered. "Mutual Distrust" is a great drawback to all industrial progress and must be eliminated before progress is made. I have had two examples of wealthy men who could invest in industrial projects, if they could have the whole business to themselves, but when I suggested to both of these, investing in one project, they would not trust each other, although they were good friends. This spirit must die out. The two men referred to above, were both co-operative society members. This is a good example of the facts of the case. Co-operation cannot be taught by lectures, but only by actual demonstration and profitable working as a pattern. These are the conclusions forced upon me by my observations and enquiries in course of my work, and I have suggested, under organisation of Cottage Industries, the methods by which true co-operation can be taught and made successful.

5. *Transport and Roads.*—The main roads and backwaters are in excellent condition, and afford cheap and ready means of transport. In this regard, the State is particularly

fortunate. However, there is one thing which is a serious impediment in the Industrial progress of the State of Travancore, and this is the bad condition of many village roads. It is no exaggeration to state that between 80 and 90% of the produce of the State is carried by head loads for miles, as Taluk reports will show. Consider the effects of this procedure. The coolie carries some 40 or 50 lbs. and this is a most costly means of transport. To give concrete instances, Vallikunnam in Mavelikara Taluk was approached by a sandy uncartable road and all the produce was head-loaded 6 miles. Kovelam to Agasteeswaram in South Travancore, Thekkakara to Kannamangalam, near Kayamkulam, and many others can be quoted. These village roads are particularly bad, and, in fact, have never been properly made. Head-loading is expensive transport, and it places our producers at a great disadvantage in that they have to be content with less profits or risk higher prices on the market. This question of good outlets for produce and village roads is one that the local communities can largely remedy for themselves. The roads above mentioned could easily be made cartable, if the landowners on either side would unite. A metalled road is not necessary, but a good tract for carts is wanted. I approached the Vallikunnam Ryots and they assured me that if the road was repaired they would raise funds for the payment. After my visit and suggestion, this road was improved and made cartable entirely by local effort. It seems that it only needs organisation and a little encouragement to be given. After one or two examples others will follow suit for the sake of securing a better market for their produce. The Tahsildars of the various places can do a great deal in this direction, and if their influence and organisation were exercised much could be accomplished. The Industries Department should do all it can to encourage such enterprises for they are essential to the industrial progress of the State.

6. *Advisory Board.*—With a view to getting mature and business opinion on various points in the industrial development of the State, I would suggest to Government the formation of an Honorary Advisory Industrial Board to the Department of Industries. They would in no way control the Department, whose head should be responsible only to Government. If projects involving considerable outlay were mooted, their advice would be valuable to Government and to the Industries Department. Further, they would be able

to call the attention of the Department to possibilities and potential industries, as also to bring forward difficulties in industrial progress. Such a Board is to be in existence in the Madras Presidency and co-operate with the Director of Industries in his work. The membership of the Board should be purely honorary, and it should meet as required. I would suggest the following composition :—

1. A member from the Alleppey merchants.
2. A Non-Official Member.
3. A member of the Planting Community.
4. The Head of the Industries Department,
(President).
5. A South Travancore Merchant.
6. The Chief Engineer or his nominee.
7. The Registrar of Co-operative Societies.

The Board could coopt members if particular advice was needed. Two meetings a year, at least, would be necessary. The Board should be entirely for advisory purposes. Such a body would have the effect of bringing closer together the opinion and work of all communities. The scheme has many difficulties, but I suggest it to Government as a great help to the solution of Industrial Problems. Travancore industrial welfare would be its sole concern. The members of the Board would really act as the communicating channel to the department for the various communities they represent and thus effect a direct link between merchants, manufacturers and the people and the Industries Department of the State. To be really useful, the Board should be small in number. Travelling allowance might be allowed to the members.

7. *Industrial Conference.*—With reference to the establishment of Industrial Conferences, I wish to point out that the Popular Assembly now plays the part of medium through which Industrial matters can be brought to the notice of the authorities. It would be profitable, however, if there could be an exchange of opinion between the Industries Department and the people in general. One large conference would not enable the Government Officers to come in contact with the people sufficiently, and I, therefore, suggest that a number of district conferences be held annually so that they could be attended by persons who could represent what they wanted in the locality where the meeting was held, and it could be immediately investigated. If every taluk or district had its

Industrial Development Board and the head of the Industries Department was to meet this committee, at least, once annually for a free exchange of ideas, it would be to their mutual benefit. These meetings might also be made the occasion of Industrial Exhibitions and Demonstrations. The question of one large conference per annum is one which I leave to Government, but I am of opinion that if the Taluk Boards and Central Advisory Committee are properly organised in correct relationship to each other and the Industries Department, an expensive conference would not be necessary.

8. *Capital*.—The question of the raising of capital for Industrial purposes is a very difficult one to tackle. The State is not lacking in money, but there is a great shyness and unwillingness to invest. Two or three reasons can be quoted, and these are set out below :—

1. The comparative safety of landed property:—The general public has a sense of possession of something tangible that can be pointed at and said "This is mine". The security of land is the factor which makes such investments so sought after. The revenue from the fertile land of Travancore is good and easily obtained and the desire for a safe and secure income with the minimum of effort and risk makes the purchase of landed property, and its possession the most popular investment.

2. The failure of various Industrial enterprises:—This is also a great factor in the problem. One has examples to quote in all parts of Travancore. Men have come forward; in many cases, with sound ideas, raised capital from their fellows and started a business. Their idea was right, but they were not expert in the particular industry and they did not understand the business thoroughly. The lack of expert advice and control has been the prime cause of failure. In many cases, Machinery was secured and a factory built. The engine was either too powerful or too weak and consumed fuel out of proportion to the work done. Technical points were omitted in the process and inexpert handling of the machinery caused an inferior product and an inferior price on the market. Many firms started with insufficient working capital. Thousands of rupees sunk in plant, but no capital to buy raw material, to give advances to cultivators as the merchants do, or to fall back upon in emergency. Lack of proper business management and mutual distrust of each other amongst shareholders all mitigated against success.

3. The lack of confidence in Industrial Work:—

This is partially due to the system of education of which industries are not thoroughly understood. An expert Industrialist is never fully trusted in his management of a concern. The proprietor and shareholders are not content to let him manage it for them, but interfere and limit his raw materials economise in vital places, and generally ruin his work.

4. The profit obtained by money lending, at high rates of interest.—The cultivator is a great borrower, of necessity, and moneyed men get higher rates of interest for their money than business could ever pay, and they have greater security.

5. The lack of actual cash for investment purposes:—

Many wealthy men, who would invest in industry are unable to do so owing to the lack of ready money. Their wealth is in land and in crops, and their payments are mainly in kind. Actual money is difficult for them to realise.

However, besides all these points of difficulty, one of the main factors is the want of demonstration. If an Industry can be shown to pay, no lack of funds will accrue. There is, however, a great lack of actual floating capital in the State. Money is required to purchase manure for agriculture purposes, for improving and investment in industry. The person is probably in possession of land, but can not realise money on it, except at exorbitant rates of interest. For this purpose, an Industrial Bank would be highly desirable. The point to be noted, however, is that such a bank must have both investors and depositors as well as borrowers. Men with money should be encouraged to invest. In its evidence before the Indian Industries Commission, the Bombay Advisory Board made a statement which has been endorsed by the Commissioners and reads thus "we favour the establishment of a Central Industrial bank or similar organisation with a large capital and numerous branches designed to afford financial support to industries for longer periods and on less restricted security than is within the power or practice of existing banks. Such a bank would probably require Government support, but should not be brought under rigid Government control". The organisation and control of such a bank should be entrusted to financial expert who should be in close touch with this Department. The reports of the Indian Industries Commission can again be quoted in this subject of organisation and control, "The

banks have no convenient agency for enabling them to ascertain whether the proprietors of small Industrial concerns are working on sound lines and possess a good reputation for honesty and punctual payment. The proposal represents an attempt to supply the deficiency and to bring such men more and more into touch with banks of repute. The scheme would, in the first place, be confined solely to industrial business with a paid-up capital of from Rs. 5,000 to about Rs. one Lakh. The Director of Industries, assisted by his technical staff and by the advice of a Committee of business men, among whom a representative of the lending bank might well find a place, would examine the financial position and reputation of applicants, and their methods of manufacture, and would certify those persons whose position was found satisfactory, as suitable recipients for a loan. This would take the form of a cash credit for a definite period and amount with a bank. Government would, under this proposal, guarantee the principal sum but with interest at a rate to be agreed on with the banks. Any bank of repute would be allowed to participate in the scheme and applicants would select the bank with which they would deal. Suitable limits, both maximum and minimum, have to be fixed for the cash credits. The rate of interest to be paid by approved applicants would be a matter for Government to decide. The latter might perhaps desire a rate somewhat higher than the rate guaranteed to the bank. Some portion of the margin would then be retained by the bank for its trouble, and the rest to be used by Government as a set-off against possible losses. If interest at a rate higher than the bank rate were levied, the bank would find in this an inducement to take over an increasing share of the business, free of Government guarantee. By doing this, the bank would receive the whole of the interest charged, instead of having to hand over some of it to Government. Similarly, if a certified applicant failed to pay his debt, the bank would only receive from Government in addition to the principal, the guaranteed rate of interest, and the bank would naturally do it best to avoid the loss of its share in the interest in excess of this, by watching the way in which the account was operated, and reporting to the Director of Industries anything which showed that action on his part was needed. This question of a bank I place before Government as of great importance but at the same time I say that such an organisation will need extreme caution, expert handling and advice, and can not be entered upon without considerable thought and deliberation. Capital by

co-operation would only be small and enough to finance cottage industries. However, as before stated, if a clear demonstration is given of a successful industry, then, I have confidence in investors coming forward. The bank's function would be to help the smaller industries and the cultivators of land. It might be possible to ally the Travancore Bank with one of the larger banks recommended in the report of the Commissioners. If one of the large banks could be induced to take up this work in Travancore, it would probably be better as a much larger sum of money would be available. Statistics for the year 1093 show that there were 135 Joint Stock Companies registered in the State with a total capital of Rs. 1,07,73,423. The total co-operative capital was Rs. 74 335 and the number of societies 39. There were 1936 members in the whole State and the total profit was Rs. 2398. It is thus seen that the co-operative spirit is, as yet, very small amongst the people. I have already dilated on this and if Industrial Co-operation for Cottage Industries was demonstrated it would be the best way of popularising the movement as far as industries are concerned.

9. *Grants, Loans, etc.*—It is recognised, that the adequate extension of Industrial Banks will be a matter of time. We must, therefore, consider other means to meet the need experienced by middle class Industrialists for current finance.

There are many ways in which Government can assist Industrial Development, and amongst these are the award of grants and loans to support particular industries. The award of such bounties is always a difficult matter. One or two schemes may be put forward. Firstly, if approved, Government would set aside annually a substantial sum of money for this purpose. Secondly, such awards might be divided into classes as follows :—

- (a) Grants-in-aid. Actual gifts out-right.
- (b) Loans. Either free of interest or a low rate, repayable after a number of years.
- (c) Payment or guarantee of payment of interest, on capital invested in a concern.
- (d) Government Demonstration.
- (e) Government partnership.
- (f) Government guarantee of certain privileges.
- (g) Cottage Industries.

These conditions are those on which financial help might be given, and I will now proceed to discuss each one separately in detail:—

(a) *Grants-in-aid.* These will necessarily not involve large sums of money, and as a general rule should not exceed Rs. 200. They should be given in deserving cases, and in many instances could take the form of payment for new equipment or tools or supply of raw materials to tide over a difficult time or purchase of tools on the hire system. They could also be given to a man to start a cottage industry and the object of such grants should be to encourage poor peasants to carry on industries in their cottages. Care must be taken, however, to see that the money so given is actually spent on the industry, as with these poor people the temptation is often great to spend it on other things. Gifts of tools, machines and raw materials are excellent methods of employing grants in aid. In some cases, of course, it is better to give actual cash, but, in all, the Department of industries should be very cautious in its working and recommendations.

(b) *Loans.* These should be of bigger sums and could be made on terms either of low rate of interest or free of interest for a number of years and repayable after a fixed period. The repayment and interest might be collected as extra tax as fixed sums per mensem or per annum. In these cases due security should be given. It might arise, and it would be in rare cases that a loan be given to a particular firm with other security than land; but this would not be the general rule, and in practically all cases security would be given. The Government should see that the money thus lent is actually spent on the industry, and that one condition should be the satisfactory statement of how the money would be spent. The report of the Indian Industries Commission on this subject of loans is quoted here as highly instructive.

“Assistance may also be given by way of loans to small or cottage industries, and to co-operative societies. This class of loans should be made by the Departments of Industries to persons or bodies whose financial position and character are found on local enquiry to be suitable. Other forms of security than landed property might be accepted, but in such cases a stipulation should be usually made that the applicants should find a fair percentage of the total outlay from their own resources. The advice of the members of the Board of Industries or of its local or special committee as to the financial standing of an applicant for a loan would be of value and would usefully supplement local enquiries. We have already stated that all schemes for Government loans to

Industries should be worked with the object of handing over the business to a suitable banking agency in due course, and the interest on these loans should accordingly be fixed at a rate which would render this course possible."

"It should be a condition of the loan that it should be spent on approved types of plant and the department itself might, when desired by the applicant, purchase the plant. There are numerous types of plant suitable for the purposes of agriculture or of small industries, which could be made available by Government on the hire-purchase system. This system has already been followed with some degree of success in Mysore by the State Department of Industries, and by private concerns elsewhere.

"We consider that some maximum limit must be placed on the amount of individual loans advanced on the value of plant supplied, under this system, but it would be for the Local Government to determine the figure to which the powers of the Director of Industries should extend. We are further of opinion that advances of this kind, whether in cash or by way of hire-purchase, should be made under a special Act providing suitable means for the recovery of outstandings. In the absence of such provision, the difficulty of recovery will tend unduly to restrict the giving of advances." In conclusion, the giving of loans would be a matter for the most careful investigation and discrimination, and the preliminary guarantees would have to be properly and fully looked into by the Government Industrial Officers. Nevertheless, it is a form of aid which will be necessary in certain cases.

(c) Payment or Guarantee of payment of interest at a fixed rate on capital subscribed for a number of years. The proposal is one which is perhaps best suited to Travancore. If the investor knew that his interest was secure, and if he knew Government had such confidence in the industry as to guarantee this interest, he would be readier to come forward with his capital. The risk to Government is small as the majority of concerns so aided after the first year would pay well and the Government cost would be nil. It is essential, however, in such cases, that the Department of Industries take an active interest in the guidance and supervision of such concerns, otherwise through careless management, an industry would have a premature death and much money be lost.

The policy of the department, however, would not be to interfere unduly with the enterprise and management of the concerns, but to maintain a sympathetic attitude and help and advice in every way possible to avert non-success. It may even be necessary to appoint a Government representative as a Director of the Company, receiving aid. The Industries Commission Report states on this point. "Government assistance may take the form of guarantee of dividends of loans of money, or of undertakings to purchase output, as may appear most suitable in each case. The guarantees may be appropriately given in the case of large industries, in which the dividend-earning stage is likely to be reached only after a comparatively long period. As a general rule, any sum paid by Government by way of guarantees should be refunded from the subsequent profits of the enterprise, when these have reached a certain predetermined percentage; and the guarantee should be only for a limited number of years, and at a somewhat higher rate than that which Government paper can be brought to yield."

Before giving assistance which involves a charge on the public funds, Government should satisfy itself regarding the financial status of the promoter and the economic and technical aspects of the proposed industry. The latter information may be collected either by Government or by the promoters, so long as the agency employed is of a nature to command confidence. Where any form of Government financial assistance is given, we consider it desirable that Government supervision should at least include audit and inspection, and that it should be secured by suitable agreements that the objects aimed at by Government will be fulfilled; also, that where guarantees are offered, unfair encroachments on the earnings of the undertaking should not be permitted to other interests."

(d) *Government Demonstrations.*—This will probably be one of the best forms of attracting capital to industrial enterprises. The idea of a Government running business purely for profit is not desirable, but Government should attempt to develop the resources of the State by demonstrations of the possibilities of industries involving the utilisation of indigenous raw materials. The various Government scholars, on their return could be given opportunities to demonstrate the industries they have studied, and experts might be entertained for other industries with the same purpose. Government can aid, succour and lead in the initial stages of

industrial enterprises. Plenty of people are ready to take up a going concern, but a few will risk capital. If Government was to start a particular industry and pioneer it to success, the handing over to a company would be easy and involve no loss, but probably profit to Government. I, therefore, recommend to Government that certain industries such as soap, pencil, matches, tapioca-flour, margarine, and weaving, be demonstrated in the near future. If these were successfully done, then others could be similarly treated when these were complete. If Rs. 30,000 were set aside as available for demonstration purposes, really useful work could be done. There is no doubt about the continuous supply of raw materials for these industries and the markets for the finished products are assured. What is needed is a demonstration of a scientific process of manufacture, a standard finished product, and training of young men to carry on the industry successfully.

(e) *Government Partnership*.—It may be for reasons arising that Government would retain its interests in a paying concern, namely, an industry pioneered to success and a company formed to take it over. If Government sees that the withdrawal of all its capital and support will be to the detriment of a concern it might leave so much capital there and become partner for a number of years receiving interest on the money. This is a possible line of action that may arise, and in such cases where Government money is involved, careful business methods must be insisted upon by the Industries Department. If it might also arise that Government would invest money in a business needing extra capital, similar attention should prevail. Two or three remarks on this subject in the Indian Industries Commission Report are of interest under this heading.

“We consider that, where industrial undertaking receive Government aid, *e. g.* by way of guarantee or subscription to share capital, their capital should be raised in India in Rupees. In order to secure that the opportunity of subscribing to such undertakings is fully opened to all classes of the public, we think that Government should control the allotment of shares, for example, by formulating rules designed to give an opportunity to small investors of joining in Industrial enterprise, and to induce the Indian public to take any interest in Industries. Similarly, it is desirable in such cases for Government, so far the circumstances admit to obtain some *quid pro quo* for its assistance

which may take the form of an undertaking to sell certain products to Government at a favourable rate and within certain specified limits of quantity if required; to give priority orders to Government in certain circumstances; or to accept a certain number of apprentices. We wish to make it clear that the foregoing remarks are to be taken in the nature of general suggestions."

(g) *Cottage Industries*.—Under Industrial Education, the organisation of cottage industries has already been discussed. It will probably devolve on Government to make the initial grant of funds to the depots to enable them to ultimately become co-operative institutions. It should also be possible to make small grants for purchase of tools etc., to the workers who leave our industrial schools. These grants, in time, would be made from the profits of the institution, but in the early stages it would be impossible for them to afford to do it.

In conclusion, I have endeavoured to indicate above some of the lines of procedure which Government might adopt in order to give financial aid to investors.

10: *Technical Examinations*.—With regard to Technical Examinations I have already indicated a scheme under Technical Education but I want to insert here one or two general remarks. In the first place, I would suggest that the Government of Travancore should conduct its own examination through the agency of the Technological Institution and the Industries Department. The Technical Institute would furnish classes for the higher stages of the examination as would also some of the more efficient schools, but, in general, it would be said that the Industrial Schools would cater for the lower grade examinations as a School Leaving Qualification. One of the points I had emphasised in my report on Industrial Education is the question of staffing the school with qualified teachers who would have some technical certificate issued by Government as a guarantee of their knowledge and training. The Indian Industries Commission state in its report the following, with reference to certain existing Industrial Schools: "The training they offer is of little value when it merely consists, as it usually does, in teaching ordinary bazaar methods through the agency of maistries who are paid much smaller wages than a good workman can earn. Something very different is wanted, and this can only be supplied by a headmaster or superintendent,

who possesses not only a thorough practical knowledge of modern methods of handicrafts and specialised experience in certain branches, but also the capacity to apply general principles to particular cases. Such a man can teach students to produce much better work than that of the bazaar worker, with less expenditure of time and energy." It can thus be seen, that not only in Travancore but in other parts of India trained and skilled industrial teachers will be required, and we must have some recognised standard of test for them. I would suggest that Technical Examinations should include all industries of the State such as coir-work, palmyra-work, mat-making, brush making and the other points mentioned in my taluk report.

11. *Bulletin.* In order to keep the public informed of the latest Industrial matters affecting local industries, bulletins should be issued monthly by this department. In the last one year and eleven months, we have issued 17 bulletins, in English, Malayalam and Tamil, and the popularity of these publications is a guarantee of their value. They have been commented on in Australia and in America as well as in Travancore itself. Matters affecting the industrial progress of the State and the results of research by the Industries Department can all be placed before the people in this manner. I, therefore, recommend that a monthly bulletin on industrial matters be issued.

12. *Cottage Industries.*—I have already referred to this matter in two places in my report and set out in detail my scheme for depots for instruction and organisation of the industries under Industrial Education. I would emphasise the need for true co-operation, and also the necessity for proper distribution of raw materials and collection of finished goods.

13. *Power.*—In this connection, I wish to bring before Government a question of vital interest as affecting the industrial development of the State. This is the provision of cheap power for driving factories. The water-falls of the State are fairly numerous, but few survive the hot weather, and what we require is power all the year round. The falls at Punalur are already harnessed for the paper mill. The Courtallam Falls are not in Travancore, but the falls at Ariankavu might be utilised for Hydro-electric work. There are one or two other places which might be utilised, but in all cases considerable expenditure will be involved and the schemes will be costly. The

question which is of immediate concern is that of fuel for Industrial purposes. The Travancore forests are rich in suitable timber, but in many cases is difficult and expensive to collect. "The forests are capable of yielding important supplies of wood-fuel, which can be most advantageously employed, after conversion into gas to generate power in internal combustion engines. Gas plants are obtainable which can be worked with the wood either in its natural state, or after its reduction to charcoal. But it may be observed, in passing, that the use of wood in steam-boilers, when the steam is required for steam purposes, is extremely wasteful and should be discouraged as much as possible." If new concerns open out, as is probable, the question arises if the supply of cheap fuel will be enough. I have had, before me, schemes for planting up waste lands with casuarina for this purpose, and I wish to mention this to Government for consideration. By allowing private enterprise to plant casuarina on waste lands, we could in ten years ensure our fuel supply and cheapen the cost of power for our industries. I have consulted many factory owners and they are agreed that, what is really needed is a good motor fuel and good charcoal. It has been frequently seen that the present charcoal burners on estates and elsewhere are wasteful, and use a very inferior article. A demonstration of efficient charcoal burning would be of immense benefit to many users of the fuel. The production of charcoal also leaves one to consider the utilisation of the other valuable products of wood-distillation by which the cost of local charcoal could be reduced. In Travancore, this is specially important when one considers the great quantity of acetic acid imported into the State annually for use on rubber plantations. It must also be borne in mind that the area under rubber is increasing annually, and that the estates which use the acid also largely consume charcoal for suction gas engines to drive their machinery. This point is also emphasised in the report of the Industries Commission when they say that the desire to direct attention to the advantages of wood-distillation as a method of obtaining charcoal and certain valuable by-products, acetate of lime, methyl, alcohol and wood-tar, by the sale of which the local cost of the charcoal would be greatly reduced. For all but the smallest units of power a suction-gas plant is extremely convenient and efficient, and they recommend that any methods which are likely to cheapen the cost of fuel for such plants should be the subject of detailed investigation and trial. Government has already recognised the importance of this

question of wood-distillation by sending Mr. Vridhachalam to study the question in Bangalore. In Travancore, however, we have also another cheap source of power which is as yet unutilised, and which we are now about to investigate namely alcohol. The Government has established in South Travancore, a large distillery with a continuous still capable of rendering spirits 40 % over proof, and which if working full time is much too great for the needs of the State. We are now commencing experiments on the utilisation of this spirit as a motor fuel and for engines of small horse power it is hoped that it would prove cheap and useful. The success of similar experiments in Hyderabad is a good omen of success. The Indian Industries Commission Report on this question states "It is very undesirable that the fuel supply of the country should be derived from external sources, and we were informed that, in the Madras Presidency and Mysore, this aspect of the question had been considered by the Department of Industries, whose Officers now recommend the use of suction-gas plant for all units of over 10 H. P. when charcoal can be obtained at a reasonable rate, and endeavour to confine the employment of the oil-engine to power units below this size. Petrol is chiefly used in motor cars and in small engines which are only intermittently employed. As a source of Industrial Power, it is unimportant; but the demand for it for other purposes is likely to grow, and the provision of a suitable substitute is generally recognised as desirable, if not actually imperative. On several occasions our attention was drawn to the possibility of making industrial alcohol from hitherto neglected vegetable materials, some of which appear to be sufficiently promising to justify investigation and experiment".

The question of power is the most important one next to finance, in our industrial problem, and if investigation and experiments as indicated above are carried out, then something will have been done to solve the problem. It is true that we have lignite beds at Warkala, and that probably Peat beds occur in the High Range, but, in both cases, the quantity and quality of the samples seen up to date have not been sufficient for a fuel supply for industrial purposes. We must therefore turn to other resources of the State for our fuel, and I think that suction-gas and alcohol engines are up to the present the best solution for our power problem.

General Remarks.—As intimated at the beginning, the report is presented in four parts and at the conclusion of the

general discussion and report, I wish to introduce certain points affecting the course to be pursued by the Industries Department, in the near future, and the cost of the same, so that, if Government accepts the ultimate working of the department as set out under the several points, the preliminary work may be done immediately so as to give a fair chance to the more comprehensive schemes. In all departments of industrial progress, experiment, research and demonstration are required. This will be seen from the detailed taluk reports, appended to this General Report, and which are not complete for the whole State. I fully realise that to establish all the recommendations at once is impossible, and also would be extremely costly, even if it could be done. But we may start on a small scale keeping in view the general principles laid down and the ultimate goal to which we are working. Incidentally, in the report, I have mentioned several things that might be taken up now, and I propose to set down concisely and fully the whole of the immediate points which I wish to submit to Government with an estimate of the probable cost of the same.

1. Government has already sanctioned funds for the continuation of the Industrial Survey Department till the end of 1094 in the Budget for 1094. These funds could be utilised to meet the expenses of administration of a new Industries Department without the necessity for a further large grant of funds. I, therefore, beg to submit that, if Government approve, this change can be made.

2. The following industries be taken up for demonstration and full investigation :—

(a) *Shellac Industry*.—Government has already sanctioned the necessary staff and funds for this purpose for one year and work has commenced under our supervision.

(b) *Apiculture and Bees-wax*.—Government has sanctioned the necessary staff and funds for one year and work has commenced of a practical nature.

(c) *Pencil Manufacture*.—A sum of Rs. 3000 is required if Government wish to do the preliminary work in connection with this industry, and as we have a Travancore Expert available, if Government would allow a demonstration, it could be done successfully. Rs. 2000 out of the above funds is required for the small machinery.

(d) *Manufacture of Matches*.—I would recommend the starting of a small factory for this purpose. The boxes

would be made as a cottage industry from palmyra leaf. Rs. 5000 at least would be required for the early stages of the work, and additional funds later.

(e) If Government wishes to undertake an industry on a large scale, I would recommend the extraction of tapioca flour. For this a minimum sum of Rs. 10,000 is required.

The above industries could be carried out immediately with great profit, and if Government could see its way to taking up any of them and allowing the Industries Department to work it up until successful, and then handing it over to public control, I am sure that it will be useful. I should await the return of the Government Foreign Scholars before opening out Soap Manufacture &c. I think it would be better to work on a few things at a time, and make them successful before other things are tackled.

3. *Cottage Industries.*—I would recommend the starting of three depots—one at Nagercoil, for weaving and brush-making, to cost Rs. 3,500. This could be worked in conjunction with the weaving school, and would do much to alleviate the condition of the weavers.

One at Mavelikara for screw-pine-making, baskets etc., to cost Rs. 2,000.

One in Alwaye for bamboo matting and baskets, to cost Rs. 1,500.

4. *Education, Technical.*—The School of Arts with its present staff and equipment to be made the nucleus of a Technical Institution and extra funds be provided for the introduction of courses in commerce and industry.

5. *Industrial Schools.*—The two Government schools at Nagercoil and Quilon to be reorganised and made the model institutions for the State. No extra funds would be required except at Nagercoil for the opening of a depot for weaving purposes.

6. *Experimental Work.*—The Indian Industries Commission emphasises the need for Chemical Work in the testing of raw materials. I wish to emphasise this also and to recommend that the Chemical Assistant be retained. The work to be done immediately is:—

1. The examination of alcohol and its use as a Motor spirit and this is of the highest importance.

2. The examination of the products of distillation of cocoanut shells with a view to obtaining acetic acid. The extraction of the essential oils of Karinthumba, and other plants.

3. The analysis of various minerals which have been collected during my survey.

4. The viscosity of tapioca flour solution so as to work out a test for purity and standard quality.

5. The extraction of dyestuffs.

6. Experiments on softening various fibres.

7. The extraction of fibres.

8. The investigation and utilisation of minor forest produce.

All these points are awaiting investigation and there is plenty of work remaining when these are done. In order that commercial conditions might prevail a sum of rupees 1,500 would be necessary for purchase of raw materials and extra apparatus. It is probable that this would not be spent but I am estimating for all contingencies.

7. *Industrial Bureau.*—An initial sum of Rs. 1,000 would be necessary for the purchase of articles for the Industrial Museum and Bureau, if Government sanction its inauguration.

8. *Exhibitions.*—With regard to this item, I wish to submit to Government that they should order the Industries Department to organise an Industrial Exhibition which shall be fully representative of all Travancore Industries and which would serve as the inauguration of the Industrial Museum and Bureau. Such an Exhibition could be held in early August in next year and be properly organised. It would give a tremendous impetus to Travancore Industries and would bring before the world at large and Travancore people in particular, the resources of the State. If a sum of Rs. 1,000 was sanctioned for this work and also for making grants to smaller exhibitions such as those now held throughout the State, it would greatly help industrial progress. If Government so authorises me, I am prepared to undertake the organisation of this exhibition, which could serve as a model for the smaller exhibitions, which are now held.

9. *Grants, Loans Etc.*—I do not recommend to Government the provision of any definite sum of money under this

heading as I leave it to them to decide what should be done and the manner in which they wish it be done. I have indicated in my General Report several of the ways in which such help might be given, but in this matter I can only leave the decision to higher authorities and await orders.

10. *Publications.*—The same procedure could be adopted as before for the publication of Industrial Bulletins and I would recommend that they be a monthly issue dealing with Travancore Industries and their development, reports of experimental work, etc.

11. *Foreign Scholars.*—The foreign scholarship scheme was placed under the control of the Industrial Survey Department and the arrangements for the ensuing year and the return of these men have yet to be completed. This work should be the concern of the Industries Department. I have arranged to provide places for some of them and done preliminary work to enable them to take up their industries privately, when they return.

12. *Extra Scholarships.*—If Government wish to extend their scholarship scheme for future students I can arrange for places for men to study industries in America, Japan, and the Straits which will benefit us greatly.

13. *Forest produce.*—There is a tremendous wealth of raw materials in our minor forest products and these are not yet investigated. I would suggest that as soon as this work is complete on the investigation of the paper-pulp industry, the Forest Officer, deputed to co-operate with me on this work, should be ordered to undertake similar work with me for the investigation and estimation of the values, commercial uses, quantities, etc., of other minor forest products. This is a most important item in our industrial development and one which can be carried on at little expense. I certainly recommend this strongly to Government.

14. *Government Stores.*—The Indian Industries Commission recommends that the purchase of Government stores should be done through the Industries Department in order to encourage indigenous enterprise. By the orders of Government I am now engaged in compiling a list of stores that could be purchased locally and I think the case will be met in Travancore if the Industrial Museum and Bureau were

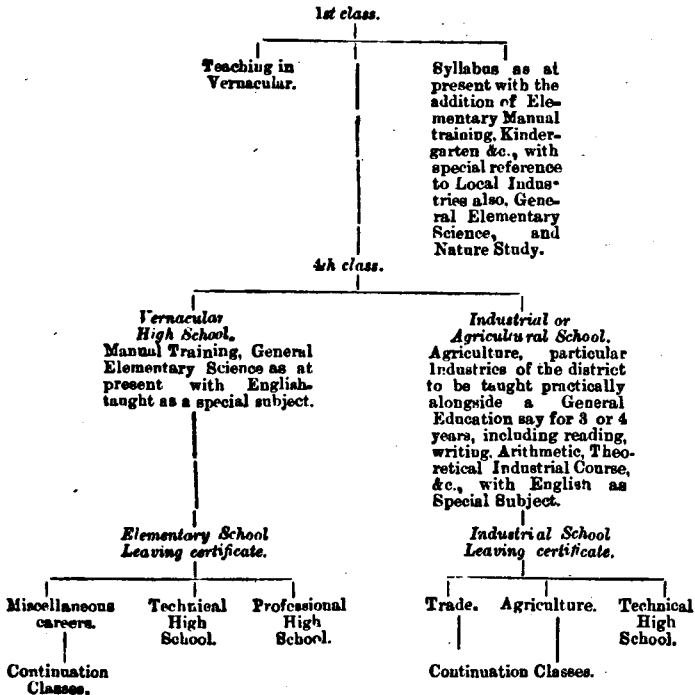
to stock samples of these goods so that Heads of Departments could see the quality and price of the Travancore articles before ordering elsewhere. It would also enable heads of Departments to enquire if the article they wanted could be made locally and the Bureau could obtain samples. In this way the Bureau could assist Government Departments without the actual purchase of stores being in the hands of the Industrial Department.

Experts etc.—It is possible that for the working out of certain industries experts should be engaged from outside for limited periods. This will no doubt have to be done in certain cases. It may also be necessary to appoint a home agent to push the Travancore goods on the outside markets and to advise the Travancore people as to the newest demands, etc.

I make these suggestions to Government and submit them with all deference as points upon which immediate orders could be passed to work in harmony with any subsequent directions that may be given for the working of the Industries Department. It is not my place to urge or suggest the necessity for such a Department and I now close my General Report and proceed to details. Industrial Education, Technical Education, and the detail Survey Reports are appended as three separate items. In all these I have endeavoured to give the actual state of things and I submit it to Government for their kind consideration and disposal. Before concluding, however, I wish to be allowed to thank Dewan Bahadur M. Krishnan Nair, B. A., B. L., Dewan of Travancore, for his unflinching advice and kind interest and help in all my work. I also wish to acknowledge with personal thanks the work and assistance rendered by the Deputy Director of Public Instruction, the officials of the Revenue Department and the Assistant Inspectors of schools. The industrial future of Travancore is bright, but progress will be slow if we are to make a lasting and efficient industrial State. A land with resources and undeveloped wealth such as Travancore must take a prominent place in the Industrial Revival that the world is now awaiting. Careful organisation, judicious foresight, and well matured plans for research and development are all that is necessary. I conclude by thanking all who have helped me in any way and submit forthwith my detailed record of work.

INDUSTRIAL EDUCATION.

VERNACULAR SCHOOLS.



Any scheme for the improvement of Industrial Education must necessarily take into consideration the particular Industries which exist in the district where the school is situated. In Europe, before the War, in many places the system was a well organised one which provided compulsory vocational classes for all scholars up to the age of 18 years. The Technical and practical part of the instruction was given in the local factories and workshops, and the schools only taught business method, general subjects and theoretical portions of particular trades were studied. Citizenship played an important part throughout all the instruction, and mutual business trust and co-operation were taught carefully. In Travancore, the same method could not be strictly applied and a modification is necessary. The chief fault of the present system of Education is that it is too literary and has a tendency to take boys away from Agriculture and Industry. Social elevation is the ambition of all classes of the community

and education has been welcomed as the readiest means to this end. In many cases this elevation is taken to mean also change in occupation, as manual labour has become associated with "coolie work" and professional work alone is dignified. Their social ambition has now to be attained with a limited horizon. It is insufficient here today for a man to be educated and to improve his mental capacity and utility in his own craft. The prevailing cry is for Government service and less arduous professional work. The people have not been taught that there are less arduous methods and more scientific ways of following their own crafts. It is true that social elevation is wanted, but let it be social progress and industrial advance by introducing better methods and better workmen with better tools and ideas. Social elevation within a particular calling is the right ideal. To attain this Industrial education is essential, for the young mind must be impressed with the dignity of his calling, his service to the community at large, his duty to his fellowmen, and lastly the newest and best methods of carrying on his work. Much arduous toil can be averted if scientific research is undertaken to discover new processes, and heavy tasks can be made light and agreeable by the introduction of suitable appliances. Industrial Education must be the prime factor in this development. The first question which arises is "what becomes at present of the boys who leave school?" Careful statistics have been taken in various parts of Travancore to discover what becomes of the boys after they leave school. The majority of Vernacular school boys (figures gathered say, 60%) leave with no prospects and remain idle, wasting their time, often for years. Others seek Government service, in fact this is the ambition of all and those who fail to get appointed are discontented and unemployed in many cases. To quote one characteristic example a blacksmith in Central Travancore has 5 sons. One is a Music Master on Rs. 8 per mensem, one is a Government peon on Rs. 7/- two are at school, and one is an ordinary coolie. The man was highly skilled and could make much money by his work. His sons thought of manual labour as undignified and although skilled workmen themselves they preferred their professional pittance and they stated "We are educated and our father is not. His calling is one which does not need education. We are qualified for something better." Another instance is that of a successful weaver, with capital, whose sons sought and obtained Government service on Rs. 20 rather than turn to weaving. The whole reason is that the present system of education does not open out for

these men a career of greater possibilities and skill in their own particular directions than that of their parents. The success of Industrial schools, if established, will, largely depend on the efficiency of the teachers. It is insufficient, in many cases, to employ a local artisan, without special training, otherwise he is no better than his fellows and can teach them nothing new, nor does he know how to keep in touch with the progress of his particular craft in the world at large. Up-to-date methods taught by well trained up-to-date men must be established and maintained. One essential to all Industrial Education must be borne in mind, and that is, there must be a ground work of General education to build upon. A minimum educational standard of the 4th class in a vernacular school should be insisted upon for this grounding. The accompanying chart shows the possible path of progress of a boy in a career of Industrial Education. It should be clearly recognised at the outset, that Industrial schools and Technical Schools are separate and must not be confounded. The former exist for the teaching of particular trades and the methods of such trades to the artisan. The latter is the education for the employer and foreman and involves a high standard of excellence and general education. In Vernacular education, the present system can remain as it is for boys who wish to follow professional careers, but an alternative course might be offered from the 4th class for boys industrially inclined. From the 1st to the 4th Class the syllabus should remain as it is, with the addition of Manual Training, Kindergarten, Paper folding &c. according to Government scheme. These various little points should be taught with regard to local industries. Grass mat weaving in Haripad and Quilon, Screwpine mats in Mavelikara etc. Palmyra weaving in South Travancore, Bamboo work in North Travancore, and so on. The elementary Manual Training exercises could be fashioned to suit these local raw materials. At the fourth class a boy would be able to proceed either to the Vernacular High School or the Industrial and Agricultural School. In all schemes one must remember that Agriculture is the main Industry in the State. Many trades followed are subsidiary to Agriculture. One of the most noticeable things in the Survey of rural areas is that the local artisans are totally unable to supply the needs of the community where they reside. Blacksmiths are both unreliable and inefficient, and locally made or repaired farm implements are most difficult to obtain. Clothes are a necessity, and for

the peasants purposes' rough cloths are required. Efficient Carpenters, Blacksmiths and Masons are wanted by Agriculturists for work to assist the development of the land. It is therefore an uppermost factor that any scheme must take into consideration the provision of efficient workmen for the supply of necessities for the local community. The Industrial Schools established should be of equal status, importance and equipment to the H. G. V. Schools and the courses should be parallel. Just as the literary subjects were taught in the H. G. V. School so the Curriculum of the Industrial School should be particular Industries and Agriculture of the District, to be taught practically alongside a General Education for 3 or 4 years including reading, writing and Arithmetic and a theoretical course of the Industry. English could be introduced as a special subject. The proportion of time spent on General Education in the first year might be half the working week and should decrease until in the final year, two days out of six should be the maximum and four days at least spent in practical work. It may be more convenient to give General Education one or two hours daily, but in any case it should be properly taught and inspected. The practical course in the final year should, as far as possible, be spent under actual workshop conditions, and at the conclusion an examination of a practical and theoretical nature should be given which will be of equal status and value to the E. S. L. Certificate. This examination should be given on the subjects of the curriculum as enumerated above. The boy could then enter directly upon an Industrial career or could be drafted to a Technical School (See later in report). Continuation classes could be provided so that he could utilise his leisure time for the improvement of his Industry. This is a brief outline of the scheme. The details are set out below.

Industrial Schools can conveniently be divided into two classes:—

1. Those catering for cottage industries.
2. Those allied to larger factory industries and general trades.

1. The former type will suit the particular district in which it is situated and be the nucleus of industrial enterprise. It should be an integral part for the Depot for cottage industries and be the most living factor of

that Depot. The Staff should possess high Technical qualifications, and facilities for Peripatetic instruction could be given to visit the workers in their houses as well. Evening classes or night schools should be started and the pupil kept in close touch after he leaves. The Depot and school should be the parent of all other Industrial schools in the Taluk. It might be wise to start the school near the H. G. V. School in the Taluk Town or largest industrial centre, but I think that for efficient working the school must be separate institution. The boys must not think the Industrial classes are another course allied to the present one, but they must fully realise that the course is a definite one of its own with a definite end in view, namely, to open out an industrial career. Boys could then go directly from Vernacular schools of the 4th class to the Industrial School or the H. G. Vernacular schools as they desired. The subject taught would of course, vary with the Industries and resources of the particular district where the schools are situated, but Agriculture should certainly play a part in the training in most cases. Other schools for special Industries at particular places should also be started. In Travancore at present there are about 34 Industrial Schools for boys with a total strength of about 1,000. Nine schools are for girls for Embroidery, Sewing and Lace making and are run by various religious organisations. The number of girls in attendance is about 750. The boys' schools vary in subjects but at least 21 are for weaving. There are two Government schools, Carpentry at Quilon, and Weaving in Nagercoil. In all some 1,000 boys and 750 girls or about 1,750 children in the whole State, receive Industrial Education. The recent returns of the Education Department show that there are 3,47,565 boys and girls in attendance at Vernacular schools. There are 341 H. G. V. Schools and 2327 L. G. V. Schools. There are also 22,841 boys and 2,827 girls attending English schools and there are 40 H. G. E. Schools and 54 L. G. E. Schools. The State total is thus 2,762 schools and in attendance a total of 3,76,028 children. Only 1750 receive Industrial Education. This is far too small a proportion to the large number of children now attending our schools. The efficiency of the present Industrial Schools is good in only about half a dozen cases. The Arthington School for boys and the Girls' Schools in the south are the most efficient. In the other cases the chief fault lies with the teachers who are not always

sufficiently qualified. Nevertheless an honest attempt has been made to introduce Industrial Education and the efforts are praiseworthy. Greater efficiency must be maintained and the work expanded. Mr. P. Ramaswamy Iyer, B. A. has already done the spade work in this matter and his policy of attaching Industrial Classes to the Higher Grade Vernacular School has been successful. But to my mind it does not go far enough. It is a good idea but so long as the two courses Industrial and Professional are mixed together the Industrial course does not become definite with a definite aim in view. The policy of separation enables the school to definitely cater for the Industrial needs of the district and also gives the boy the definite idea that he is preparing himself to follow a set Industrial career. It is to eliminate the idea of any relapse into the groove in which he is at present, *viz.*, that education gives him social status outside his own calling, and if he follows his particular craft, education will be useless to him. This idea must be uprooted. The present Government Industrial Schools are both in need of reorganisation and it would be a good start to make these the pattern schools for the State at the outset. One thing is essential and that is that these schools must remain in the closest contact with the local industries. The full scheme of such schools is set out below.

Administration and Inspection.—Before laying down the precise type of school which is suitable for the State it would be well to consider the organisation and controlling agency for these schools. In the report of the Indian Industries Commission, which has just been published it is definitely laid down, that “To ensure the maintenance of close relations between the training institutions and the world of Industry, the general control of technical education should be transferred to the Department of Industries”. This note as the finding of the Imperial Commissioners is a most important one, for it is essential that Industrial Education should be in the closest touch with the Industrial requirements and progress of the people. At present the Education Department is doing good work but this is not meeting the vital question either fully or with the best efficiency. One point which has impressed me in the course of my survey and my visit to the existing Industrial Schools is that the system of inspection in vogue is not sufficient. This is no fault of the Education Department, or of the Inspectors of schools, who work hard, but is due to the fact that these men are trained on a literary basis and do

not understand the technical processes and points they have to inspect. They are unable to question the boys on the technical points of the courses and unable to advise or guide the teachers in matters industrial. In fact, the teacher is left alone and beyond a carrying out of routine, has no real check placed on his work or method. In some cases, out-of-date methods may be taught and in others the teacher has little practical experience of teaching industry. Further, for the development of particular industries it is essential that the school should be in close touch and under the guidance of those controlling the industrial progress, in order that the points most needed should be upper-most in the teaching. It, therefore, is suggested that as far as technical and industrial subjects are concerned, the inspection should be done by the Industries Department. In this way as far as possible the training will be under actual workshop conditions and the men turned out will be such as will be able to take their place in industrial concerns. Also, the schools will be controlled by those who know what is wanted by employers of labour. In passing these remarks one must recognise the valuable foundation work done by Mr. P. Ramaswamy Iyer, B.A., to whose energy and zeal the present schools are largely due. He cannot however put technical men as Inspectors of Schools for he requires men for the heavy work of inspection of the ordinary Vernacular schools. I therefore commend the suggestion of the Indian Industries Commission for the consideration of Government.

Location of the schools.—It is difficult to indicate exactly where the schools should be placed but I would suggest that at the out-set, the two existing Government schools be reorganised in accordance with the scheme of Industrial Education set out herein. Other schools could be established as time goes on in each taluk, at the taluk centre or important Industrial locality. These schools should be the industrial leaders of the taluk and should be equipped to serve the taluk interests. I have suggested throughout my detailed report the subjects which might be taught in each taluk school. One must also recognise the private schools and the aided schools now in existence, and these should be fostered, helped, and reorganised in accordance with a definite plan. It is scarcely wise to multiply the number of schools for teaching particular subjects such as weaving, when many of our weavers are unable to obtain work. It will be better to divert these people to develop local resources. I therefore

suggest that the existing schools be made up-to-date and re-organised and then if successful, they could serve as the models for other taluks to follow.

Provision of the Schools.—Throughout my survey I have met the leading men in all the taluks and it has been a pleasure to note that they were anxious for the establishment of Industrial Education. Their anxiety was of a practical nature, and I have had many offers of buildings and equipment if the maintenance could be undertaken by Government. It is clear that many of the schools could be provided by local subscription but if Government wish to develop Industrial Education then they must not rely on this. The Government Schools should be the pattern and ideal model of what an Industrial School should be, and this can only be attained if proper supervision and control, such as Government would exercise, are established. Local effort can be encouraged and local subscription utilised to the fullest extent, but I feel certain that for the proper efficiency Government must maintain a number of its own schools to keep up the standard and provide means for development of smaller industries, where the local people could not afford to help themselves. A system of grant-in aid could be instituted for private schools as is now the case in the Education Department. In this regard care must be exercised to avoid a tendency amongst certain people which is evident at present. An example will explain the position. A man with a limited amount of capital has the enterprise to start a small industrial concern. He does not have any particular training or knowledge, but he employs a few workmen and begins to make certain articles and substitute. This places him under the difficulty of relying on his labour and the average workman is not slow to take advantage of his technical ignorance. The result is that before long he loses his money and has the institution thrown on his hands. In order to avoid total loss he turns it into an Industrial School and then appeals to Government for aid. His teaching staff are his old workmen and he is truly in difficulties. These are not industrial schools and they are founded on failure. It will be far better to train the investor to understand business and the technicalities of the work, and then to aid him in a business concern purely on this basis. I would therefore recommend that a number of Government Schools be started to meet the needs of particular districts and that Grant-in-aid Schools be also maintained, provided they are efficient and serving a

useful purpose. As a first step the Quilon and Nagercoil Schools could be reorganised on a proper basis and others could follow these patterns if they prove worthy of such a procedure. There will also be a number of local Schools which are provided by public subscription. It has been suggested that these Schools can also be partially maintained by local effort. This should be helped and encouraged, but efficiency must be the premier requirement. It is my hope that the public element of support and control of these institutions should increase on co-operative lines in the case of cottage industries to a great extent. It may be also that large factories will have their own Schools for their own people.

Type of Schools.—It has already been stated that two kinds of Schools will necessarily be required.

- (1) for cottage industries.
- (2) for factory industries.

I think it will be well here to state in detail a scheme for the organization and encouragement of cottage Industries.

Cottage Industries.—The great difficulties in the way of the development of cottage industries at present are :—

1. Lack of proper and settled market.
2. No stock in hand to supply urgent orders.
3. No proper patterns and designs or organisation for instruction of the industry.
4. No possibility of learning new patterns.
5. No capital. Workers are very poor.
6. No fixed hours of work or fixed rates for same.
7. No idea of time taken to do a piece of work.
8. No organisation for the production of articles in quantity and of standard quality and design.
9. No means of securing raw materials in quantity and improving the preparation of the same.
10. Unreliability and unpunctuality of the workers.
11. No system of distribution of raw materials and collection of finished goods for market purposes.

These are the chief difficulties which gave cottage industries in Travancore to-day, and it is to remove these

that our attention has to be directed. I will deal with these points *seriatim*.

1. *Lack of proper and settled markets.*—This is a serious difficulty and one which it is not easy to remedy. The general procedure at present is for the works to make a particular article and then carry it round the bazaars to see who will give the best price for it. Towards evening if no sale has been effected the pangs of hunger prompt him to sell it for less than cost price in many cases. An example from Alwaye in North Travancore will be illustrative of this point.

Alwaye.—The cottage industry here is Basket making. About 20 families are engaged in the work. The goods are made locally and a single basket of bamboo takes $1\frac{1}{2}$ days. For this As. 4 to As. 6 are obtained. The worker finishes one basket and goes out to sell it. If unsold he starves and has no money to buy bamboo to carry on his work further. He starts with a price of 6 annas and may be lucky enough to realise this at the Railway station. If not sold by evening he goes to the local merchant and offers his goods in exchange for goods. The merchant is diffident, for he does not want to stock the goods and at last consents to take it at a reduced rate. The worker loses by the transaction and is forced by physical necessity to do so. He thus regards his work as a means to obtain a mere existence. Half his time he is going round begging for a sale and in consequence he loses opportunity to do more work. Although in point of time $1\frac{1}{2}$ days per basket can be reckoned, yet counting the hours wasted in getting a purchaser, 2 to $2\frac{1}{2}$ days is nearer the time estimated. He lives in a local cottage in penury and want. There is no place where he can receive orders for his goods at regular rates and sell them with certainty. Even if there was it would be difficult to convince him that this was his best course. They feel that perhaps they could get more and fail to realise that they waste valuable time searching for a purchaser who will give more. If they worked during this time, they could earn more. Regular work and regular habits are unknown to them. A proper and settled market or Depot to which these goods could be brought for sale is a necessity but something more is wanted than this as is shown below.

2. *No Stock in hand.*—The system by which they make an article and then sell it immediately for food renders

it impossible for the worker to have any stock in hand. He would starve if he did so. He can not save from the money he gets and thus could not get even a small store of capital. When catering for the outside market it is necessary to produce goods in quantity. Large orders have to be met and often in quick time. What is the effect of a large order at present? An example will suffice. Through the agency of this Department we secured a large order for rattan baskets from Warkalai. The leading men of the basket makers' community were approached and an excellent sample was produced and approved by the Firm. Then came the trouble. "No money" was the first plea. We obtained an advance for them. Then they worked irregularly and did not realise they were losing time. Their good fortune at the prospect of work made them slack, and they tried to spin out the time. As a consequence the firm withdrew the order, often the amount of the advance was worked off. Further orders were not given. Now, if a Depot existed where stock would be kept for supply in quantity and also a catalogue and patterns etc., it would eliminate this trouble.

(3). *No proper patterns and designs etc.*—This is a great trouble. The worker is often ignorant and knows little of the World outside. He knows less of the demands of the market and of the resources of his own industry. The people are slow to take up new designs fearing loss by no sale for the goods. The old patterns are often out of date and not wanted on the market. The goods are made to designs which are not calculated to give the greatest efficiency and in consequence this industry slacks. Another trouble is the flooding of the local bazaar with catalogue containing cheap designs and cheap patterns of Western goods and these are often copied by the local workmen in the hope that they will thus be up to date. There is real desire on their part to improve their patterns and these cheap designs are the only means they have of seeing anything different. It is thus that good Indian patterns are dropped out altogether instead of being adapted to modern requirements. It is therefore necessary that there should be some medium by which instruction can be given to these people to show them the proper way to catch the market with their goods by making the articles of the pattern required and adopting their old designs to these new demands.

(5). *No Capital.*—One of the great stumbling blocks in the way of the development of new cottage industries is the

fact that no capital is available amongst the workers themselves. The popular idea is that this capital can be furnished by co-operation and I am convinced that ultimately we must look to co-operation for our controlling and financial agency in this work. However, my survey has equally convinced me that co-operation at present borders on the impossible, with the class of workmen who carry on our cottage industries. Most of them had little education, if any at all, and live a hand to mouth existence without ever being able to have any settled income. They work and, if they sell their goods, they eat; if not, they starve. Co-operation cannot be taught to them by lectures or abstruse explanations. The co-operative idea amongst these people is that it furnishes an easy means of credit. Under these circumstances to speak of capitalising cottage industries by co-operation, seems to be a little premature, and I would suggest that the only means of fostering this right spirit of co-operation and of ultimately carrying on cottage industries by means of co-operation is by the gradual tuition of these people in the proper way. My suggestion is therefore, that alongside the industrial school which is established for the instruction of a particular craft, there be established a Government depot for the fostering of the industry. The functions to be exercised by these depots are manifold and are to meet the troubles which are enumerated above. Firstly they should be for tuition. Not only an Industrial School should be connected with them but there should be travelling instructors to visit sub-depots in the villages and there might be night schools also. The instruction to the skilled workers would be merely indicating and introducing new patterns and designs and making goods which the modern market demands to replace their old patterns. Attention should be paid to the historic part of the designs and an expert in charge would be able to assist the people in their homes. The second function would be to get into touch with the outside markets and to supply the goods in quantity. Stocks of the articles could be maintained and large orders supplied. It should not be intended that these depots should remain for ever under Government control but a system of co-operative saving could be introduced, so that the people themselves could gradually work up a financial interest as co-partners in the depots. Gradually the amount of local capital could be increased until finally the people would be so educated as to control the depots themselves. In this way by gradual education co-operative depots could be established, and at the same time the people could be gradually instructed

in true co-operation and co-operative principles. It might be that a small percentage of the value of each article made would be retained by the depot in the name of the maker as a shareholder and interest paid annually on this sum, however small, from the profits of the institution. Thirdly, the depot would be a centre for distribution of raw materials and collection of finished goods. In this way it could be guaranteed that all articles would be of standard quality and pattern, and it would be possible to regulate the prices and the rates charged. The people would then soon realise the exact value of their labour and the value of time. They would become thrifty and it is hoped that self-reliance would be developed. To accomplish this an initial grant would have to be made and it would be necessary for Government to exercise a strong control over the institutions so that they would serve the purpose for which they were founded. Weaving, Mat making, Brush making, Lacquer work etc., would all be treated thus with good effect. The detailed report submitted has shown the cottage industries suitable for each Taluk. This is the best organisation that can be established for cottage industries. In Bengal there is a cottage Industries Association for fostering these industries and in Mysore there is also an institution for organising and assisting cottage industries under a superintendent. We must have some similar thing here and after a careful survey of the State I can unhesitatingly state that the depot scheme seems to be most suited to Travancore. The Central Organisation of these depots is also highly important. Each and every Depot would be attached to an Industrial School. The pupils who leave the school could be given some small grant from their earnings to purchase tools and set themselves up in business. This should not end their connection with the school. There should be a Juvenile Labour Bureau attached to each school. This would be a register of old pupils and would be a means of obtaining posts and work for them. Briefly its function would be to maintain a record of pupils who are skilled with notes against each as to his special ability etc. Tradesmen and employers of labour would then be able to apply to the bureau when they wanted a boy trained in a particular direction and the bureau itself would be able to give the depot for cottage industries the names of workers suitable for contracts they may get. Employers of labour would thus find the skilled labour they require without searching for it and also a certain standard of efficiency could be guaranteed. In the case of cottage industries the depots would

be able to employ those trained in the schools and maintain contact with old pupils and keep them up to date in their requirements. Such is the outline of a depot for cottage industries and these depots could easily be attached to the industrial schools so that the educational side and the spread of expert knowledge could be greatly assisted. From the foregoing it is obvious that there must be a central controlling agency for these industrial schools and depots. At the outset it should be pointed out that these Government depots would not be expensive organisations if attached to the schools as the staff for both institutions would be the same. The central controlling organisation should be the Department of Industries and there should be special organisation for this part of the work. One of the things that has to be done in the commercial world is to advertise the goods that one has for sale. The central agency would have the inspection of the depots and schools and upon it would devolve the finding of markets for the goods. I would suggest that this central agency take the form of an industrial museum, and that a complete collection of all the industrial products be obtained and also raw materials. As research work was completed it would be the business of the bureau to develop the market for the product and to duly advertise it by publications etc. The Bureau would publish an annual catalogue, preferably illustrated showing the resources of the State and giving the prices and tradesmen from whom the goods could be purchased. The articles in the Bureau could be sent out as patterns and samples and the orders obtained would be transmitted to the depots. This central controlling agency should be directly under the Department of Industries. The whole question of industrial education is so closely linked up with industrial organisation that I have thought it wise to give here the full scheme for cottage industries, and to show how close a part education must play to the development of cottage industries. Under heading 2, we find factory industries and we have to cater for them in a different manner. An Industrial School for Factory Industries would cater more especially for the apprentices in the works who were learning the practical part of the business under actual factory conditions. In the case of big factories it is probable that they would prefer to have a school of their own and train their own men to follow their own methods. In the case of smaller factories one or two could unite together to obtain a good class. In this case it

affirmed that the best method of training is the apprenticeship system together with what might be called vocational education. The theoretical part of the trade and the elements of general education should be taught to these people alongside their practical work in the factory. The number of large factories in Travancore is small and it is probable that this type of school would be few in number. Trades-Schools for Blacksmithery, Masons' work, Carpentry and other subjects subsidiary to agriculture are highly necessary throughout the State. One of the greatest impediments to agricultural progress is the unreliability, unpunctuality, and bad workmanship of a local artisan in repairing and making farming implements. This part of Industrial Education is highly important and special schools such as the Quilon Carpentry School and the Arthington Industrial School as also the Kottayam C. M. S. School, could be developed for this purpose rather than purely for cabinet making. Weaving Schools should also be developed. It may be also that particular schools could be started for the development of particular communities for example the Kammalars, and all these should be controlled with the one idea of Industrial Progress and should be catering for the industrial requirements as laid down and found out by the Industries Department. It is clear then that for Industrial Education the Industries Department should be in the closest touch with every detail of it and that a school should be particularly designed to suit particular requirements of the district in which it is situated. In conclusion I can summarise my proposals as follows:—

1. In accordance with the findings of the Industries Commission and the above suggestions, Industrial Education should be inspected by the Industries Department and the purely industrial part controlled by that department for the greatest efficiency.

2. Schools for cottage industries should be of a distinct type and should be superintended by an expert who should also be the head of a Government Depot, for the development of cottage industries in the district around the school.

3. There should be a central controlling agency in the Department of Industries which should also be in charge of an Industrial Bureau and Museum which should be for commercial use and not merely for sight seeing. In this it must be carefully distinguished from an ordinary museum as the objects in view are entirely different.

4. The Industrial Bureau should issue up to date catalogues.

5. The Government Depots should aim at fostering co-operative spirit and developing the cottage industries on co-operative lines. Their function should be educational and they should endeavour to set the standard and counteract the bad effect of cheap designs.

6. Trade schools and schools connected with particular factories and communities should also be part of the scheme, but should be separate institutions set apart for a particular purpose.

In submitting the above to Government I am aware that only the outlines and the principles of the scheme have been given and details can be furnished later. I would suggest however, that the two Government schools be reorganised on these lines for Weaving and Carpentry and that other schools be opened in suitable places slowly so as to build up the system on a firm foundation. It would be no use educating the people industrially if we do not take measures to supply them with employment after their training is complete. The depots are intended to do this. I would specially commend to Government the idea of a Juvenile Employment Bureau and also the necessity for the proper organisation of our cottage industries. Night schools could be encouraged so as to keep skilled workmen in touch with the market's demands and industrial progress. The aided Industrial Schools could be encouraged and could develop particular industries as they do at present into business concerns. There is ample scope for Industrial Education in Travancore. Three things that must be impressed in the curriculum of such schools are punctuality, reliability and good workmanship. Industrial Education at present is undeveloped and the existing schools can be said to be average with about two exceptions namely the Arthington Schools and the Mulagumudu Orphanage which are excellent. The aided and private schools should be encouraged and a proper syllabus of work drawn up, regular teaching given by efficient teachers and the elements of business instilled into the pupils. At present I find irregular hours attendance a tendency to make the school a commercial institution running for profit rather than for instruction of the pupils, pupils doing cooly work for skilled artisans and a lack of business method. The schools may and should be able to earn a little, particularly third year boys, but this should not be an object in view. One of the difficulties at present experienced is that the pupils, in their early stages,

waste raw materials. Where such materials are Government property and are products of Travancore it might be possible, *e. g.* timber, rattan, etc., to give concession rates for woods to be used by the pupils only. These points are worthy of consideration.

Scholarships.—The majority of the pupils of the peasant class, from whom these boys are to be drawn for industrial training, are very poor and to ask them to attend school for 3 or 4 years after the fourth class, would be a real hardship to their families. There is no doubt that many would not find it irksome, but for those who did so, it would be wise to give small monthly stipends of Rs. 3, 4, and 5 for the three years' training. These scholarships should be well distributed about the State and should be awarded as a result of the work in the Vernacular School up to the 4th class. These scholarships would encourage the boys to take up industrial work.

Industrial Career of Pupils.—In practically all countries in Europe, the boys are cared for even after their school career is over. "After School Care Committees" have been formed and Juvenile Labour Employment Bureaux could be organised under the Headmaster of each Industrial School for his district. The function of such bureaux would be to see that when a boy left the Industrial School he did not waste his time. Definite employment should be found for him and employers of skilled labour could apply to the bureau for workmen and such would be supplied. Funds should be provided so that each pupil who leaves, should have a full set of up-to-date tools of his craft and a small capital to begin his career. This could be partially paid out of the income from sales of the institutions, but should also be a Government grant to the boys provided that they pass the Government Technical Examination and are satisfactory in every way. The Bureau would maintain contract with him and by assistance, advice and practical help guide him over the initial stages of his Industrial Career. The lack of capital to buy a set of proper tools is a serious handicap to many poor boys who would be skilled workmen and well trained. The giving of a definite idea of employment and finding a place for the pupil to begin work should also be done. It must, however, not be allowed that pupils become hangers on at the institution and good organisation found against this. One thing that is very lacking in all artisans in the State

is that they have no idea of the value of their labour and of the proper time to finish a piece of work. Unreliability and unfixed prices are the ruin of the majority. In some cases they estimate less than cost price and in others they are ridiculous in their charges. Local blacksmiths and carpenters are maligned on all sides for this and the result is they lose the local trade and agricultural implements are imported from big reliable firms to the detriment of local artisans and their ultimate ruin. This point can only be taught by establishing modern, well-equipped, well-ordered, business like Industrial Schools. The present private Schools should be made to come into line and gradually the organization would take effect. New Schools for particular industries should be established directly the demand was urgent as *e. g.*, brush making in South Travancore. The teaching in these schools will be in Vernacular, but a little English will be necessary to enable the pupil to profit by the Technical Schools of higher degree if he is able to attend them.

Library.—In order to keep the school up-to-date a school library containing translations of the best books on the subject taught in the Vernacular and the local industries should be maintained for reference by the local artisans. This will enable the more educated and ambitious to keep in touch with the latest improvements of their processes and craft. Books on co-operation and economic questions should also be kept. There is one other question and that is the training of the staff of these schools. A particular type of teachers is required---skilled worker and trained teacher combined. This training could be alone at the central Institution in Trivandrum and should be a 2 years' course. The candidates should be artisans before appointment as teachers, should pass the Government Technical Training Examination in these subjects.

Industrial Examinations.—There should be a School Leaving Certificate Examination for Industrial Schools. The addition of Technical subjects to the present examination is the right idea but is not enough. The examination should be common with the Vernacular School Leaving Certificate Examination in General subjects but the practical test in craftsmanship should also be important. Arithmetic, Vernacular, Drawing, Writing should be given together with a theoretical and practical test in the craft. This would be a final examination for Industrial Schools and would correspond

to the Elementary Technical Examinations of the Madras Government to-day. The Government Technical Examinations would be a different affair in the higher stage and preparation would be done in schools equipped for higher work in the subjects taken. I therefore suggest that the Industrial School Leaving Certificate Examination replace the elementary stage of the Technical Examination and that the Intermediate and Advanced stage be inaugurated as later examination after Special training. The cost of such a procedure would be small as they could all be managed by a Technical Examination Board and the present Vernacular School Leaving Certificate Board conjointly.

The Higher Examination would be purely in craftsmanship, but it would be good thing to introduce the elements of General Education into the Lower Grade Examinations.

Finally I have endeavoured to set out a scheme which will meet the needs of the State most exactly and which I am sure would greatly assist the Industrial progress. The scheme is designed to organise industries at the same time as to educate the workers. I submit the foregoing to Government for orders. Appended is a list of *Industrial Schools* in the State at present with a few details concerning each.

STATEMENT OF DEPARTMENTAL AND PRIVATE INDUSTRIAL SCHOOLS FOR BOYS IN THE STATE.

Name of School.	Whether Departmental or private.	Taluk.	Present strength.	Staff.	Subjects taught.
Nagercoil S. M. R. V. Technical School...	Departmental.	Agasteeswaram.	26	3 Teachers, 1 Clerk & 1 Peon.	Weaving and allied subjects and some general education.
Puthalam Industrial School ...	Private.	Do.	16	8 Teachers.	Do. Do.
Vadasery Krishnavilasom Weaving School ...	Do.	Do.	15	1 Teacher	Weaving and allied subjects.
Narayanavilasom Weaving School, Vadasery ...	Do.	Do.	8	2 Teachers.	Weaving alone.
Neyyoor Weaving Institute. ...	Do.	Eranieil	26	2 Teachers.	Weaving on fly-shuttle looms. Theoretical and practical knowledge of the different parts of looms.

**STATEMENT OF DEPARTMENTAL AND PRIVATE INDUSTRIAL
SCHOOLS FOR BOYS IN THE STATE.—*contd.***

Name of School.	Whether Depart- mental or private.	Taluk.	Present strength.	Staff.	Subjects taught
Malayinkil Sree- krishnavilasam Weaving School ...	Private.	Neyyattin- kara.	15	2 Teachers 1 peon.	Weaving subjects.
Chani Weaving School ...	Do.	Do.	20	2 Teachers.	Do.
Kulathur Sri Rama- vilasom Weaving School ...	Do.	Trivan- drum.	34	2 Teachers.	Do.
R. V. Drawing and Painting School ...	Do.	Do.	21	3 Teachers.	Drawing and paint- ing.
Katinamkolam Coir Industrial School.	Do.	Do.	87	2 Teachers.	Coir Industry.
Arthington Industri- al Institute ...	Do.	Do.	58	1 Superin- tendent 6 Instructors 1 Clerk 1 Watcher 1 storekeeper and peons.	Cabinet making, Blacksmithery and Drawing.
Srikanteswaram Ivory Carving Insti- tute ...	Do.	Do.	35	1 Manager 1 Clerk 9 Teachers.	Ivory carving and Kuftagari works.
Kadakavur Saras- wathivilasom Weaving School ...	Do.	Chirayin- kil.	16	2 Teachers 1 peon.	Weaving, sewing and General Instruc- tion
Attingal Weaving School ...	Do.	Do.	18	2 Teachers.	Weaving and Gene- ral Instruction.
Keezhattingal Shuu- mugavilasom school ...	Do.	Do.	16	2 Teachers.	Weaving.
Bhagavathivilas Weaving School ...	Do.	Do.	12	1 Teacher.	Do.
Quilon Carpentry School ...	Depart- mental.	Quilon.	49	7 teachers. 1 peon.	Woodwork, draw- ing, manual tra- ining and general instruction.
Mangad Weaving School ...	Private.	Do.	66	2 teachers.	Weaving (Theory and Practice).
Paravur Srikrish- navilasom Indus- trial School ...	Do.	Do.	44	7 teachers.	All sorts of coir works, blacksmith work and tailor- ing.
Sripadmanabha- vilasom Mat- Weaving School, Thazhava ...	Do.	Karuna- gapally.	Thazhava Vern. Sch.	2 teachers.	Mat Weaving.
Kollaka Weaving School ...	Do.	Do.	20	2 teachers.	Weaving handloom.
Mannadi Weaving School ...	Do.	Kunna- thur.	27	2 teachers.	Do.
Kunnathur Pallikal School ...	Do.	Do.	42	2 teachers.	Do.
Onathukara Weav- ing School ...	Do.	Maveli- kara.	25	2 teachers.	Weaving (Theory & Practice.
Lippakulam Weav- ing School ...	Do.	Do.	25	2 teachers.	Weaving, Mat weaving, Sewing.
Erazha Mat Weav- ing School ...	Do.	Do.	30	1 teacher.	Mat weaving.
Thuvavoor Weaving School ...	Do.	Shertala.	15	2 teachers.	Cotton weaving

**STATEMENT OF DEPARTMENTAL AND PRIVATE INDUSTRIAL
SCHOOLS FOR BOYS IN THE STATE.**

Name of School.	Whether Departmental or private.	Taluk.	Present strength.	Staff.	Subjects taught.
Thyccattuserry Industrial School ...	Private.	Vaikam.	114	2 teachers.	Coir Industry.
Punnathara Sugar Industrial School.	Do.	Ettumanoor.	Ettumanur. H. G. V. Sch. 32	1 peon. 1 teacher.	Sugar Industry.
Chingavanom Industrial School....	Do.	Kottayam		3 teachers.	General Instruction, basket making.
Kottayam C. M. S. Industrial School	Do.	Do.	20	4 teachers.	Carpentry, Blacksmithery & general instruction.
Vazhapalli Devivilasom Weaving School ...	Do.	Changanacherry.	27	3 teachers.	Weaving.
Sripadmanabhavilasom Weaving School ...	Do.	Mavelikara.	20	1 teacher.	Do.
Moolankulam Industrial School...	Do.	Kottayam	33	3 teachers.	Rattan work.

PRIVATE GIRLS' INDUSTRIAL SCHOOLS.

Name of School.	Whether Departmental or private.	Taluk.	Present strength.	Staff.	Subjects taught.
Mary Immaculate Tech. School ...	Private.	Agasteeswaram.	160	6 teachers.	Embroidery and General Subjects.
Home Lace School, Nagercoil ...	Do.	Do.	32	3 teachers.	Lace, and General subjects.
St. Joseph's School, Nagercoil ...	Do.	Do.	84	3 teachers.	Embroidery.
Asaripallam School.	Do.	Eraniel.	53	2 teachers.	Do.
Mulagumudu Orphanage ...	Do.	Do.	123	8 teachers	Lace and Embroidery.
Kaladi School ...	Do.	Trivandrum.	17	2 teachers	Weaving.
St. Michael's School.	Do.	Do.	49	6 teachers.	Lace and Embroidery.
St. Joseph's School, Quilon ...	Do.	Quilon.	64	6 teachers.	Lace and Embroidery.
St. Joseph's School, Alleppey ...	Do.	Ambalapuzha.	33	3 teachers.	Drawing, Lace & Embroidery.

SECONDARY SCHOOLS.

Preparatory Class.

Teach to the end of
3rd Form, General
Elementary Science
and Nature Study.

Syllabus as at present with
paper folding, kindergarten
and Elementary manual
training, suited to the dis-
trict.

4th Form.

Professional.

Industrial and Agricultural.

Ordinary High School.

Technical High School

General Elementary
Science and Manual
Training otherwise
as at present.

Forms
IV, V, and VI.

English Mechanical,
drawing Practical,
Mathematics & c.,
Local Industry.

Science, Physics, Che-
mistry, Zoology, Engi-
neering, &c., Manual Trai-
ning, Commercial Sub-
ject, Vernacular.

Secondary School Leaving Certificate.

Technical School Leaving Certificate.

Medical College, Arts
College, Law College,
for graduating B. A.,
or B. L., &c.,

Various careers
Government service,
Clerkships, profes-
sional or other Office
work, under-gradu-
ate teachers.

Various careers
Enter works or factor-
ies as apprentices, far-
mers etc.,

Technical College.
For graduating in En-
gineering Textile work
etc., Agricultural
College, Forestry
College.

Continuation.

Continuation.

Classes
in subjects
required.

Technical
Classes

Sch.
Keez
mug
sch.
Bhag.
Wea
Quilon
Scho

Technical Education.

The training of men for the higher posts in technical education is one which is most important but one in which very little has been done in the State up to the present. It can be said that no organisation exists for the training of technical men and that there is a scarcity of qualified industrialists to take higher positions as foremen, managers, and organisers of industrial work. The tendency of the boy who gets his School Leaving Certificate at present is to attempt to follow one of two careers. Either he secures admission to a college and proceeds to a degree or joins Government Service in a subordinate position. If unable to do either, he remains unemployed. For the boy who joins the college the majority elect to follow a literary course feeling that this is the only way in which they stand a likelihood of getting employment in later life. There comes another crisis at the Intermediate Examination when many failures are recorded and large numbers are annually thrown again out of employment. Various causes are ascribed to these failures but in

many cases the truth lies in the fact that they should never have entered a literary career at all and if some technical training had been available they would have succeeded in some other direction. It is essential that before technical education can be given, a good solid grounding of a suitable nature should be imparted. I do not propose at present the establishment of junior technical schools but as far as Travancore is concerned what is necessary is a reorganisation of the scientific part of our secondary schools. The establishment of separate technical schools of equal status to the Higher Grade English schools would be ideal in certain places but would be difficult and costly at present. It is unnecessary to specialise the training when the pupil is too young, but it is necessary to give a suitable grounding for the specialised work later. The first step, to my mind, is to equip the Secondary Schools with science laboratories and well trained teachers with liberal equipment. In many cases this has been done but much still remains to be accomplished. The Secondary Schools should then introduce mechanics, practical physics and practical chemistry, and manual training. If this was done and a good course of drawing introduced, the Secondary Schools would provide our boys with a highly efficient grounding and preliminary training for a technical career. The general grounding so obtained has all the characteristics necessary for a pupil to become an intelligent apprentice to a trade, to proceed further with higher technical education of a specialised character. All that is necessary at the present time is the equipment of good laboratories for practical work, the introduction of applied mathematics, manual training, drawing and practical science teaching into our secondary schools. The Secondary School Leaving Certificate would have to be modified so as to allow a boy to take these subjects. Drawing should include Geometry. Under manual training I include the elementary ideas of local industries and I can conceive of coir making playing a large part in the course as should also basket and mat weaving, etc. I do not recommend that any new course should be introduced before the fourth form, because I consider that to be the minimum grounding of general education. To state it concisely my proposal is that after the fourth form there shall be a distinct science course in our Secondary Schools which shall be of such a nature as to prepare the boys efficiently for later technical work. I would, however, recommend that technical schools be established in good centres with specific

purposes in view. In this regard I would include a forestry school for the preparation of subordinate Forest Officers, an Agricultural School and also a Technical Research Institute and School to be established in Alleppey for coir manufacture, oil extraction and commerce including commercial subjects. With reference to the latter I have had promises of support from many of the leading merchants and businessmen. Although coir making is one of the staple industries of the State it is significant how little scientific work has been done on the subject. We still adopt laborious methods of beating and soaking and prepare the coir in an old fashioned way. The problem of softening the coir and also of dyeing and bleaching it, has not been fully worked out. There is great field for research work in this industry alone. To turn to other fibres there are over 40 fibre trees in the State and the method of extraction from each of these varieties has yet to be worked out. I could mention as an example Kyvan, Rosil, Sago Palm, etc., all of which are unknown commercially. The extraction of dyes has not been fully investigated. The distillation of essential oils and the estimation of their commercial value has yet to be done. The manufacture of wood pulp, the investigation of alcohol as a motor power, and other subjects of a numerous character are all awaiting scientific development and investigation. It is therefore necessary that there be a scientific organisation with a well equipped laboratory and highly trained men to undertake this work. Then again it may be that particular resources have to be developed upon a commercial basis and an industry founded.

One must bear in mind that one factory does not make an industry and it is essential that men be trained under practical conditions of working. In order to appreciate any training a scientific grounding must be given. If demonstrations of particular industries are given, then men must be trained to carry them all. From the foregoing it will be seen that an institution for the training of men in higher technical education should be established. It cannot be said that this institution should be entirely of the nature of an Intermediate College of Engineering for this would not meet the present demand in Travancore. It must be an institution in the closest touch with local industries and have ample facilities for higher technical work and training as well as for the improvement of indigenous craftsmen. The Indian Industries Commission emphasises the importance of such institutions for technical training in its report and recommends

that the control of technical education should be entirely in the hands of the Industries Department. What is wanted is not a school of a mere academic character but a place designed to meet the needs of the particular industries of a district where it is situated. In Travancore, the Technical school should exist for teaching and for research work of Travancore resources. One of the problems in the introduction of Industrial Education is to find qualified teachers and this institution would be able to serve this purpose. The testing of materials, development of processes, demonstration of industries should all be done through its agency. This should be under the strict guidance of the Industries Department who will be in close touch with the industrial needs of the State. To establish and maintain such an institution will be exceedingly costly and involve an initial cost of some lakhs of rupees. Alternative proposal to which will be the most economical way of attaining our end. The institution must have small beginnings and must gradually be built up. My proposal is to reorganise the School of Arts, Trivandrum, as the School of Arts and Technology, and make it the nucleus of our Technical Institution. The present functions of the school should be maintained as a Department of the reorganised institution and there should be added to it two other Departments so that its constitution could be expressed under three headings:—

1. Indian Arts and Indian Artistic Industries. (The present School of Arts.)
2. Industries and Technical Work, Engineering, Demonstrations and research, on Industries.
3. Commercial subjects.

One thing that the institution must do is to render all succour and aid possible to the Ancient Indian Industrial Arts and develop the same with due regard to original design by establishing new markets and wider scope for modern conditions. Before going into exact details of the organisation of the newly constituted Technical Schools it would perhaps be well to review the position that a School of Arts and Technology should occupy in relation to Indian Industries. To proceed to discuss the function of the Arts Department it is seen that the field of a modern Indian Arts Department is a wide one but locally it can be divided into two classes.

The first class deals with Fine Art and subordinates the useful to the beautiful whilst the second is the study of the art of design and its relation to Industry. Here the useful is the basis of study and its purpose the application of the useful to beauty. Let us now consider the function of an Art Department in relation to the industries of the State and not the study of Fine Art. Artistic Industries may be divided into three classes :—

1. Local handicrafts which have with difficulty survived foreign competition.

2. Artistic Industries connected with local factories.

3. Artistic Industries depending upon and connected with Architecture and Building trades.

Certain people think that the only object of a School of Arts should be to perpetuate old Indian Patterns. It should certainly be part of its function but it would not bring salvation from the economic ruin threatened by European and Japanese competition. On the other hand it must be remembered that when her artistic crafts were prosperous and flourishing India was isolated. A change in taste has taken place since then consequent upon India's contact with the outside world but the methods of Indian craftsmen have largely remained unaltered. The highly organised industries of Europe and Japan together with the above conditions have brought about the collapse of many of the local industries. Particularly is this the case of weaving in Travancore and one can point to other artistic industries as for example, Kuftgari work, that are dying out because they have not been kept up to date. It is true that the Ancient Art of the State should be encouraged but it is equally true that the obvious function of a School of Art and Technology should be to keep in touch with modern conditions and tendencies. At present we have no institution fulfilling this purpose in Travancore. Industrial Progress lies in making the best use of that which cannot be altered. The Technological School must be the servant of industry which is flourishing and the leader of that which is languishing. One of the faults of the craftsmen in Travancore is their isolation from each other and in consequence their inability to develop as a community or to supply quantity. What is necessary is that these isolated craftsmen must be brought together and directed by one organisation so that their designs may be adapted to the modern conditions of the world's market instead of that

of the immediate locality and if this is done the Artistic crafts of the State will again be in a flourishing condition. The detailed Taluk Reports have set out the most important of the local artistic handicrafts but they can be enumerated as silk weaving, cotton weaving, pottery, goldsmithery, gold and silver thread work, kuftgari work, brass and bronze work, ivory carving, lacquer work, metal polishing, screwpine and palmyra mat and basket weaving, bamboo mat and basket weaving, and more recently lace making. Of these crafts weaving gives employment to a great number of workers and the last census returns showed that 1% of the people of the State were connected with the Weaving Industry. If the weavers were organised and directed to weave goods suitable for wider markets with modern appliances instead of for localities with old methods they would have a chance of asserting themselves upon something like equal terms with their competitors. The essential elements of success in such an organised community are that the direction shall be in the hands of persons having wide and modern practical experience of the Industry, and having already a business organisation at work in markets suitable for the goods, the country will produce. A depot need not be housed in expensive buildings and a cheap site could be found for it in a District in which the Industry is now carried on. The metal workers, Gold and Silver Smiths are in a better condition than the weavers but even in this case something similar could be done.

Books containing the best shapes and designs have not been translated into the Vernaculars, whereas the bazaars are flooded with illustrated catalogues issued by European Firms dealing in commoner sorts of silver ware and jewellery. As these trade catalogues can be acquired for nothing, they circulate freely. The evil influence of this circulation is that most of the alien shapes and patterns are presented before the people. To eradicate this evil, Government should establish a Bureau at the Central Institution for collecting the best designs of useful articles and for circulating their true copies to different craftsmen who were engaged in such industries. The Government could then establish Depots in every district for the supply of raw materials to the craftsmen and the collection and the inspection of finished articles. This has been done in other countries where such Institutions have been established and good results have been produced. Under Industrial Depots I have dealt fully with these Institutions for Travancore. The professions and

Industries under applied art comprise designing and engraving, Photography and photo mechanical works, lithography, printing, book-binding, Engineering design, Architecture, &c. The artistic branches of trade need the assistance of a school for their development. To impart the instruction the function of the Indian Art Department, may be to prevail early morning and evening classes for the study of drawing and design for higher Technical Subjects connected with each industry ; but classes should not be started before there is demand for them, amongst the people working in the craft.

Designing and carving on stones for stone work, wood work, and plaster work, cabinet making, tile work, &c., are of special importance in Travancore and we do not lack opportunities of giving the pupils practical experience of the same. Here in Travancore this could easily be done as we have a fully equipped pottery with up-to-date appliances already existing in the School of Arts, Trivandrum. The main reason for the inferior quality of many buildings in India, is that they are left in the hands of contractors who have had no training in craftsmanship, and who do not employ master craftsmen under them. There is, therefore, every necessity for the provision of such a Department in Travancore in our Technological Institution. My reason for dealing with this point at such length is that I want the present equipment of the School of Arts to be utilised to the best advantage and its reorganisation on this basis would bring it into living touch with the Industries of the State. To be more detailed in these proposals I would suggest that our Technological and Art Institute should begin in a small scale with classes in mechanics and Elementary Electrical and Mechanical Engineering. Mechanical drawing, Weaving, Drawing and design, Electro-plating, Wood and Ivory carving, silver work, pottery, Commercial subjects and other local Industries. The majority of these should be started as courses in the mornings and evenings and at the same time there should be day courses in textile work, Coir making and Engineering together with a full course in Commercial subjects. All this can be done in the present building and at very little expense about the present one. Engineering would include Mathematics, &c., and much of the practical work could be done in local workshops. At first I do not recommend an elaborate scheme, but if a beginning was made it would be easy to build up a good institution. At present the

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cost to Government is about Rs. 19,000 for the Institution and the income is small. If, however, it is reorganised as indicated above, then the additional cost will only be a few thousand Rupees and in addition the Government will have a Technological Institution, a Bureau for cottage Industries, an Industrial Museum, and the Department of Industries will have adequate staff and buildings for demonstration and practical work. If public funds are available for the Institution, such as the Shastri-abdapurthy fund, then if the Committee is willing and Government approve, the money could be utilised for establishing a good industrial research and training Laboratory or the Industrial and Commercial museum. This would enable the Industries Department to undertake demonstrations of Industries and to train men to carry on the Industries efficiently. The site of the present School of Arts is big enough for expansion of buildings and the income could be greatly increased if the Institution was properly reorganised. It is essential that any reorganisation should be in close touch with the Industrial needs of the State and as the Indian Industries Commission has laid down, it is essential that the Industries Department have the control of Industrial and Technical Education for this to be done. The Commercial class would embrace Short-hand, Type-writing, Banking, Book-keeping, Commerce, Accounts and Accountancy, shipping &c. Men thus trained will be of the greatest use to Firms and Businessmen, and also in Government Offices and Treasuries. It would also give to our young men an opportunity to learn the elements of business and we should not find so many Industrial failures amongst educated men who have risked a small capital. One of the best functions of the Institution would be to provide well equipped and well-trained teachers for the Industrial Schools to be established throughout the State. Thus little by little as these schools are inaugurated, teachers will be available and a standard of efficiency maintained. With regard to the staff for the new courses we shall have the Government scholars who will return from Europe available and also we have sufficient qualified local men for the morning and evening classes. These men could be drawn from the P. W. D. and other places. One of the questions which is vital to the success of Travancore Industries is the provision and use of power and it will be necessary to train Engineers for this purpose. Finally the Technological Institution must be for Industrial research to find out the Economic and Commercial value of

the raw materials with which the State abounds, and this research Department should be an integral part of the Industries Department and the Technological Institution. It is a matter of extreme difficulty to separate Industrial and Technical Education from each other and from the Industries Department but there is a clear line between the work of an Industries Department and a purely literary academic and Educational organisation. It would be impossible to relate the two without rendering the Industries Department ineffective and inefficient. The development of our local resources is a big work and can only be done slowly and firmly. If one or two things are dealt with at a time and when successful handed over to the public, and if others are then taken up and treated similarly, the Industries Department will have been successful. Side by side with this Industrial development there must be the training of young men to carry on the Industries, improve them, and make them permanent. Such is the work of the Institute of Art and Technology I have suggested for the consideration of Government. If this step could be taken then as the demand arises other Institutions could be started in suitable centres and gradually the demands for Technical Education would be met. It is only by this gradual process of evolution that we can organise the Industries of the State. One other thing that is necessary is the establishment of a good Library containing all the latest books and standard works on Industries and processes together with the up-to-date journals on Industrial matters. This is very essential and will greatly assist the students in keeping up-to-date. I commend these suggestions to Government as being the most economical and efficient method of starting Technical Education in Travancore.

As an alternative proposal to the above Government might start apprentice classes for engineers etc., and the practical part of the instruction be done in the local Workshops. In any case a small beginning could easily be made.

SHENCOTTAH TALUK.

Area.—129. 14 Square miles Population. 46,820.
 No. of Houses.— 11,284. No. of Voters. 150.
 No. of Pakuthies 10. Taluk Town. Shencottah

Location.

Division.—Forms the eastern portion of the Quilon Division.

Boundaries.—**NORTH.** The Achenkoil River divides the taluk in the north from the Chenganoor taluk.

EAST.—The eastern boundary is formed by the Tinnevely district of British India. Shencottah can be regarded as the frontier taluk. Five pakuthies are more or less isolated and surrounded by British Territory in the Tinnevely District

SOUTH.—The south is Pattanapuram Taluk and the boundary is twice crossed by the upper reaches of the Kallada River.

WEST.—A tributary of the Achenkoil river forms the main portion of the western boundary dividing it from the Pattanapuram Taluk.

Railway.—The Trivandrum-Quilon, Tinnevely branch of the South Indian Railway runs right through the taluk and three stations have been opened for traffic.

Rivers.—This taluk being situated on the north eastern side of the Ghats and also embracing a considerable portion of hilly land there is not much opportunity for water traffic and it can be said to be outside the reach of the backwater area. In point of fact most of the export is done to British India and it is mainly carried on by road and rail. As already mentioned the Achenkoil river and the Kallada river touch the taluk but neither of them is navigable. The water difficulty has been recognised by the Government and they have constructed tanks for irrigation purposes in the taluk. The Arienkavu waterfall is perhaps one of the most likely sources of power for a hydro-electric project in the State.

Main roads and Village roads.—The main road from Quilon to Tinnevely runs right through the taluk and there are good branch roads in all the places. The road communication in the ordinary places is quite satisfactory and the main roads in good condition.

Nearest Seaport.—The nearest seaport is Quilon but there is very little traffic for export except forest materials. The distance to Quilon is $60\frac{1}{2}$ miles and can be travelled entirely by rail or by road.

Cultivation.

Wet land area. 8230 acres. Dry land. 24,444 acres.
Cocoanut area. 395 acres. Number of cocoanut trees.

About 33,000.

No. of Palmyra trees. 46,400. No. of jack trees. 1,600.
No. of mango trees. 1,900.

Pakuthies.

Name of pakuthy.	Area.	Population.	Wet land.	Dry land.	Cocoanut land.
Shencottah ...	9 25 sq. miles.	12,140 persons.	1,713 acres.	4,467 acres.	101 acres.
Karkkudy ...	2 18 sq. miles.	1,230 persons.	638 acres.	730 acres.	10 acres.
Puliyara ...	4 20 sq. miles.	3,930 persons.	1265 acres.	5,451 acres.	10 acres.
Pudur ...	1 93 sq. miles.	1,160 persons.	346 acres.	684 acres.	10 acres.
Mekkara ...	3 25 sq. miles.	...	163 acres.	2,711 acres.	10 acres.
Achinpudur...	5 43 sq. miles.	4,730 persons.	63 acres.	4,050 acres.	65 acres.
Ilathur ...	5 36 sq. miles.	3,850 persons.	1132 acres.	1,348 acres.	25 acres.
Kilangadu ...	2 14 sq. miles.	2,650 persons.	938 acres.	206 acres.	141 acres.
Ayikudi ...	5 88 sq. miles.	4,000 persons.	703 acres.	2,188 acres.	20 acres.
Sambur ...	...	...	...	...	...
Vadakara ...	7 06 sq. miles.	5,340 persons.	1211 acres.	2,640 acres.	75 acres.

Education.

GOVERNMENT VERNACULAR SCHOOLS.

No. of H. G. Schools. 2. No. of boys 677.
No. of Girls 40.
No. of L. G. Schools. 7. No. of boys 695.
No. of girls 133.

AIDED.

No. of L. G. Schools. 4. No. of boys 190.
No. of girls 24.

GOVERNMENT GIRLS' VERNACULAR SCHOOLS.

Name of School.	Grade.	No. of classes.	No. of pupils.
Shencottah.	L. G.	4	216
Elathur.	L. G.	3	76
Pulankudiyiruppu.	L. G.	2	75

GOVERNMENT BOYS' ENGLISH SCHOOLS.

Incomplete H. G. English School, Shencottah. 4 Forms.
160 boys. 1 girl.

There is no Girls' English School and no Industrial school in the taluk.

Natural products and their present utilisation.

Paddy and rice.—There are about 8000 acres of wet land in the taluk and this land yields two crops per annum. Over 16,000 people are engaged in agriculture as skilled workers. Most of the rice is consumed locally and the irrigation works and tanks which Government has provided are opening out more areas for paddy cultivation. Paddy is only grown in the plains at the foot of the Ghats.

Cocoanut products.—There is a very small area of less than 400 acres under cocoanut cultivation, and this is scattered throughout the taluk. It cannot be said that the coir industry is carried on at all, for the particular district is devoid of water suitable for soaking, and beyond taking the cocoanuts for local consumption little is done.

Tapioca.—Tapioca grows in Shencottah, Karkudi, Puliya, Pudur, Mekkara, and Sampurvadakara, but in no place is cultivated on a large scale. The soil here cannot be said to be particularly suitable for the cultivation and it is doubtful if any great increase could be made. In any case it would be insufficient to build up an industry.

Lemon grass.—Lemon grass grows wild in some of the forest regions and it could be cultivated in the Puliya pakuthy. At present no distillation is carried on but it would be possible in both Karkudi and Puliya pakuthies.

Palmyra.—In Ayikudi, Ilathur and the pakuthies on the plains the palmyra tree grows in large numbers. There are over 46,000 trees in the taluk and the industries carried on are very similar to those in South Travancore. We find toddy drawing, jaggery making, making palmyra mats and baskets, extraction of fibre are largely carried on in Ayikudi, Ilathur and Sampurvadakara. There is an arrack distillery of a small kind at Shencottah where the jaggery from the district is used for fermentation and manufacture of alcohol. Large quantities of jaggery find their way to British India and are used for refining sugar in Tinnevely refinery. This is one of the main industries of the taluk. In an industrial school here, mat weaving and basket making could be

taught and organised as cottage industries. It should be mentioned however, that this taluk has more natural resemblance to the east coast country and that most of its exported produce finds its way directly to British India to the markets of Tinnevely and Tuticorin. The possibilities of the palmyra industry have been fully described in Bulletin No. 16 of this Department and the notes set out there can also be applied to Shencottah taluk.

Tea and rubber.—On the higher parts of the taluk tea and rubber are cultivated and hundreds of acres covered by the estates. The land is highly suitable for this and other country in the vicinity can also be opened out. The industries are in the hands of experienced planters and are in a flourishing condition.

Food Grain.—Besides paddy and rice there are large quantities of Cholan, Chamai, Varagu. The chief pakuthies for the cultivation are:—

Chamai.—Mekkara, Karkudi, Sampurvadakara, Puliya, Pudur and Atchanpudur.

Cholan.—All pakuthies.

Varagu.—Ayikudi, Atchanpudur, Mekkara, Puliya, and Karkudi.

These grains are used locally and also exported to other places.

Hemp Fibre.—At Ayikudi there is a kind of hemp grown which is easily spun into yarn and when woven gives an excellent substitute for gunny. The fibre is extracted from a plant which grows on the paddy fields and is sown after the crop of paddy has been harvested. It grows to a height of about 5 ft. and is then cut and beaten on the surface of the water. The result is that the fibre is torn away from the stalk in long threads about 2 or 3 ft. in length. It is of a pale whitish yellow colour and weaves into a clean type of cloth. About a hundred people are actively engaged in the industry and the daily earnings of a workman in this craft are 4 As. In order to make the yarn into a kind of canvas for conveying water, cholam paste is used as a coagulant and sizing is done with this material. The oost at present for rough sacking is about Rs. 3 for $7\frac{1}{2}$ yards and for a water-proof variety 3 yards for Rs. $1\frac{1}{2}$. The great trouble at present is to persuade the makers to weave unsized material. This is

required for gunny substitute. Probably it would be better for the weaving if the process was done on a power loom and greater attention was paid to the spinning of the yarn, which, at present, is uneven. It is made into good ropes and twine also. The industry needs development and improvement. A large area should be placed under cultivation, proper weaving of the yarn introduced, and the making of finished gunny and canvas properly done. The market is assured locally and if capitalised and ably managed the industry can become a far reaching success.

Aloe fibre.—Large quantities of aloe fibre are extracted in the Taluk and exported to Quilon and Cochin. The aloe plant here is of the small variety and the fibre is extracted from the tender leaves without soaking. The method of extraction is as follows. The fibre is in the fleshy leaves. These are taken and crushed by beating with hammers and mallets of wood on to a wooden board. This crushes the fleshy matter to pulp. The leaf is then placed upon an inclined board and the worker seats himself at the upper end. A horizontal knife blade with a handle at each end is then taken and the leaf is scraped from one end to the other. This removes the pulp and lays bare the fibre. The position of the leaf is then reversed, and finally the pulp is entirely removed. The hanks of fibre so obtained are then hung in the sun to dry and to bleach. Twine is made from the fibre, but the larger portion of it is exported to Quilon and other places as fibre. Some of the fibre is sold locally for rope-making etc. About 30 families are engaged in this work and these live in or near Shencottah town. The price realised at present is 8 annas for 50 pulams or about 7 lbs. and the daily earnings of a workman vary from 6 to 8 annas. There is plenty of raw material growing in this taluk for the spreading of the industry and possibly if mechanical extractors were used there would be a great impetus to the business. The fibre is found in quantity in Achenpudur pakuthy.

Sappan wood.—Sappan wood is found in small quantity in the Puliya pakuthy and is unutilised. If it is used, unless plantation is done at the same time, the supply will not be perennial but will soon be exhausted. It is necessary that if any use is made of the wood now growing, that at the same time systematic planting of new trees be undertaken. It is estimated that in the whole Southern Forest division only 7 or 8 tons of Sappan wood are available annually. It is possible that more could be obtained and if planting was

done then the supply could be kept up and a valuable dye obtained. This is an industry that needs attention and scientific development.

Oil pressing.—Large quantities of gingelly are available and are pressed in local presses for oil. This is used locally and also for export *via* Tenkasi. Ayikudi pakuthy is the most productive in this capacity.

Trees and timber.—Rubber, Iluppa, Pinnay, Tamarind etc. Forest trees are in abundance.

Plantains.—Large areas are under plantain cultivation at Arienkavu. This is one of the few places in the State where plantain cultivation is carried on in proper plantations rather than in small gardens and compounds. At present the fruit is collected and exported. The fibre is rejected altogether. The extraction of the fibre could easily be undertaken in the Taluk as there is ample raw material. There are one or two cases where small hand machines have been purchased and work commenced, but owing to lack of organisation and capital these were not successful. It is not of any use to produce just a few lbs. of fibre, but this must be worked up to produce tons so that export to proper markets may be possible. Fruit preservation etc., could well be done in the district, though, perhaps, Punulur would be the best place for a factory. At any rate, the Plantain fibre Industry should be taken up here.

Existing Industries.

Agriculture.—As in other Taluks Agriculture is the main industry and occupation of the people. There are over 8,000 acres of paddy land in the Taluk and large areas are found which grow Gingelly and other commodities. About 16,000 people can be classed as skilled agriculturists and more than 100 landlords with an average income of over 800 Rs. per annum can be found. The cultivator or small farmer has an income which is above the average for other places, *viz.*, about 400 Rs. per annum and it takes him practically the whole of this to maintain himself. The ordinary worker or agricultural labourer can earn about 4 annas per day and is able to obtain work for about 2/3 of each month. The large number of Estates for Tea and Rubber cultivation which are found in the District make it easy to obtain work of regular character if they so desire. In this Taluk one of the main crops is Palmyra and similar conditions prevail to those in the Tinnevely District of British India. On the whole agriculture

is in fair condition and when the irrigation work is completed then paddy cultivation will be greatly improved and enhanced. In Shencottah there are many excellent blacksmiths who carry on the work of supplying local Agricultural needs and it is done here to a greater extent than in some other taluks. Besides the ordinary work necessary for agricultural development they also carry on a trade in cooking and other household utensils. They are fairly business like but they are not punctual in delivery or regular in their work. It is in this direction that much can be done by industrial education.

Coir and Copra.—It cannot be said that this Taluk attaches anything but local importance to these two products and in point of fact only a very few trees are found in the Taluk. The cocoanut area is less than 400 acres or roughly about 1/400 of the area of the Taluk. Soaking facilities are few and after the nut is extracted the husk is burnt for fuel. Copra is not manufactured on any large scale and the oil that is expressed in the local mills is chiefly for local use. The Taluk is not a good cocoanut area and it cannot be said that any great development can take place. The cocoanut area is practically confined to 4 pakuthies. Shencottah has 104 acres. Kilankad has 141 acres. Samboorvadakara has 75 acres and Achanputhur has 65 acres. The other Pakuthies of the Taluk have not much more than 75 acres amongst the six of them. The cocoanuts are used mainly for food. Recently an attempt has been made to make buttons from cocoanut shells and this is referred to fully later in this report. Shencottah, however, does not seem to be the best position for securing raw material as far more shells are available in the Taluks nearer the coast.

Weaving.—Weaving is one of the main industries of the Taluk and workmen are to be found in almost every part of the district. It is estimated that over 300 weavers are working here. Special mention should be made of two communities of weavers living in Shencottah. One of these is Mahomedan and the other is Ezhava Community. The Mahomedan weavers live together in a street and practically all the houses have their own handlooms and the men work on these daily. The sizing of the yarn is done along the alley of the street and much of the work is done by women and children preliminary to the weaving by the men. The Mahomedans weave coloured cloths mainly for their own use and also for export to Tinnevely and other places. They obtain the yarn chiefly from Tenkasi and also from local merchants.

The Ezhava community weave white cloths as well as the coloured variety. They also live together in a street. Probably about 300 people are dependent on weaving in each community. The Mahomedan people have already organised their industry on a more or less co-operative basis. One of their number has been appointed as seller and buyer and all transactions are done through him. It is he who knows the current market price and also the best place to sell the finished goods. He acts as Director of a depot. When the cloth is finished it is handed to him for sale. He sells this along with others and is thus able to supply larger orders than a single individual could do. This means that the weavers are not dependent on small individual orders and the organisation works well. He is paid commission on his sales and also is the supplier of yarn and dyes for the community. This is really a co-operative depot idea and its success is amply demonstrated. The union of these people is their strength and they get larger orders and supply them because they are working as a community and not individually. The weaving in the other pakuthies is for local purposes only and the people are scattered about. There is no place in the State where the weaving industry would be so easy to organise on a co-operative basis because the principles are in practical working order at present. A depot for instruction and improvement of the industry would be of great service here.

Cotton.—The production of cotton on a small scale is done in the Ayikudi pakuthy but no great industry is carried on. The possibilities of extension are not great but undoubtedly something could be done. Experimental work is necessary before any definite pronouncement can be made on the subject.

Blacksmiths.—In Shencottah itself there are a large number of blacksmiths engaged in making culinary utensils. Shencottah is well known for this ironware. Spoons and ladles and iron chatties are made and exported to other parts besides being sold in large quantities locally. The ladles are made wholly of iron and cost about 7 to 8 annas each. The bowls and chatteys are sold for as much at Rs. 4/- to Rs. 4/8 each. The industry is at present a good one, but a suggestion, that the iron goods, if enamelled, would fetch a much better price, is worthy of consideration. It could be easily done with a stove enamel apparatus and the goods so produced could rival the Japanese ware now on the market. The cost of such installation on a small scale would be very little and probably Rs. 500/- to Rs. 1000 would be more than ample. The blacksmiths are skilled workmen in this art and it seems

a pity that they are not being kept up to date and taught the method of manufacture that the market now demands. Enamel ware could be made a great success here.

Candle sticks.—A small industry is carried on by a few workmen under Messrs Viswanathan and Co. of Shencottah. This is the manufacture of brass candle sticks for punkah candles. Three men are engaged and the industry is profitable. An attempt is being made to manufacture cheap candle sticks in iron and tin and then to plate them with nickel or other bright metal. If this is successful then the industry can be greatly extended. The present cost of a brass candle stick is Rs. 3/8. This will be much less when the goods are made in cheaper metal. The method at present is to shape the various parts by hammering in a mould shaped in the required fashion.

Button manufacture.—The button factory for making buttons from cocoanut shells was first established at Kottarakara but afterwards removed to Shencottah. The machine is hand driven and consists in rotating the shell against knives which give it the required shape and size. The button is bored centrally and sewn on to cards for sale after polishing. There is much to be said both for and against these buttons. They are cheap and the raw material is plentiful, but they lack polish and are brittle. Much work remains to be done before these become popular or thoroughly marketable. The work at present is being carried on by a small local syndicate, and, if they add to their products other kinds of shell buttons and also bone buttons, the concern will be successful. Bulletin No. 10 of this Department has dealt fully with the subject.

Ivory carving etc.—There are several ivory carvers working in the town of Shencottah and these men do good work. They can earn as much as Rs. 20/- to 36/- per mensem if in full work. Wood carving is also done and useful articles made. These are only done to meet orders and by contract.

Basket and mat making.—These are already mentioned under palmyra products, but they are important as cottage industries. Some hundreds of people are engaged in this calling and use it as an auxiliary source of income. The women workers can add as much as Rs. 3/- to the monthly income by mat making. The large quantity of Palmyra trees in the Taluk, and particularly at Ayikudi, make it essential that the industry should be extended. Match-box-making, Brush-making, Basket making, can all be introduced and these

people should be comparatively easy to instruct, since they are already skilled in this work with their fingers and would readily adapt themselves to new work. It should be possible to make this industry of match-boxmaking a great success as the matches could be made either from soft woods in the forest near, or from split bamboo, or from cadjan stalks. This suggestion might be carefully investigated. The remarks on the palmyra industry in South Travancore might be applied here. As regards sugar and jaggery practically all the supply in this taluk which is not consumed locally is sent to the sugar mills at Tinnevely.

Iron Work.—In former times, the iron industry flourished in Shencottah and local ore only was used. In Shencottah itself, there is a mound which is composed of the waste matter from these iron smelting operations. These have ceased to be worked and yet plenty of raw material is available at the same source, *i. e.*, the river bed some five miles away. A close examination of the river bed for some miles reveals the presence of a black substance in considerable quantity. This is Iron Oxide together with Iron Carbonate. It is found as a sandy material and it can be fused with carbonaceous matter to yield iron. The appearance of the ore seems to indicate that higher up the stream there is considerable quantity which washes down with the water. The industry of iron smelting is now defunct in this place, but it would be worth while to examine the source from which this ore is washed out, and to prospect it to find the quantity and quality available.

Possible Industries.

Enamelled iron work, Gunny bag making, Hemp canvas making, Basket making, Matches and Match boxes, palmyra industries, Candle sticks, Buttons, can all be developed here and have been fully dealt with above. The taluk is not a rich one and co-operation will have to be used to obtain the capital necessary to run many of these industries.

Foodstuffs used and available locally.

Rice, Choram, Chamai, Tapioca, Yams, Plantains and Vegetables. Fish is imported from Quilon.

Economic Statistics.

There are about 16,000 skilled agricultural workers and about 1,000 traders and merchants. The working population can roughly be divided as below and apart from those mentioned above numbers about 1750.—

Name of craft.	No. of workmen.	Wages, etc.
Carpenters.	250.	8 to 12 annas per day.
Masons.	150.	8 to 10 annas per day.
Blacksmiths.	200.	Up to Rs. 1/-per day but usually employed on contract work.
Weavers. about	1000.	Amount varies according to work done usually about Rs. 7/-a month.
Aloe workers.	30. families.	6 to 8 annas per day.
Candle stick marks. about	3.	Rs. 3 to 15 a month.
Ivory carvers, Goldsmiths, etc.,	A few scattered about here and there.	Contract work only Income vary up to Rs. 20/-per month.
Coolies.	Some thousands.	4 to 8 As. a day.

COST OF LIVING.*Cultivator's family.*

Rs. 3. per day.

Cooly's family.

Rs. 8 a month and compound produce, vegetables etc. A cooly works about two thirds of the month.

Single person.

About 8 As. per day.

NO. IN FAMILY.*Cultivator.*

About 7 persons.

Cooly.

4 or 5 persons.

*No. of people qualified as voters—850.**No. of professional people, Vakils, Officials, etc., about 400. to 500.***Existing Co-operative Societies.**

No co-operative society was formed in this taluk up to the end of 1092. A co-operative depot for weaving and cottage industries would greatly assist the industrial development of the taluk.

Joint Stock Companies.

Name of Company.	Registered Office.	Capital.
The Arumukavilasa Dravya Sakaya Elanithi Co., Ltd.	Elathur.	Rs. 60,000.
Arya Vinayaka Dravya Sakaya Elanithi Co., Ltd.	Pudus.	Rs. 30,269.
Lekshmini-Kadana Dravya Sakaya Elanithi Co.	Shencottah.	Rs. 37,000.
Dharma Samvardhana Ancha' Dravya Sakaya Elanithi Co.	Do.	Rs. 18,275.
Tiruvarayan Swami Jenopakara Elanithi Co., Ltd.	Do.	Rs. 48,600.
Sri Bala Subramania Swami Dravya Sakaya Elanithi Co., Ltd.	Do.	Rs. 57,000.
Nytyia Kalyani Ammal Dravya Sakaya Elanithi Co.	Do.	Rs. 21,600.
Bala Subramania Swami Dravya Elanithi Co.	Do.	Rs. 9,680.
Bala Subramania Swami Dravya Sakaya Prize Nithi Ltd.	Do.	Rs. 62,500.

Capital and Remarks.

Although no co-operative capital was found at the end of 1092 yet a total capital of nearly Rs. 3,35,000, has been registered in joint stock companies. Many of these are to deal with forest produce and others for rubber and tea cultivation. In Shencottah itself there are a good number of merchants with money to invest in good concerns and at present the best investment seems to be the development of forest produce. For cottage industries co-operation is necessary and a properly organised depot would help greatly. For larger industries capital could be obtained locally. One of the causes of the lack of co-operation is the low standard of education in the taluk, and this, it is hoped, will soon be remedied. The taluk needs proper organisation in industrial matters and many of the minor products of the forests could, be successfully worked here. As a source of power the falls near Arienkavu are amongst the most promising in the State. The whole question of harnessing the water power here is worthy of investigation and note.

NEYATTINKARAI TALUK.

Arca.	233.53 Square miles.	Population.	1,78,700.
No. of houses,	31,933.	No. of Voters.	199.
No. of Pakuthlies.	18.	Taluk Town.	Neyattinkarai.

Location.

Division.—Forms the southern portion of the Trivandrum Division.

Boundaries.—**NORTH.**—The Karamanai River divides the taluk from the Trivandrum Taluk and later the Neyyar river divides it from the Nedumangad taluk.

EAST.—The Tinnevely district (British India).

SOUTH.—Vilavancode Taluk.

WEST.—The Arabaian Sea, coast boundary.

The eastern part of the taluk is hilly.

Railway.—The nearest railway station to Neyattiukarai is Trivandrum which is 12 miles from the taluk town.

Rivers and backwaters.—A canal runs from Trivandrum to Kovilam. The Karamanai river forms the northern boundary but is not wholly navigable. The Neyyar river runs through the taluk but also is not navigable to any great extent. The produce of the taluk is almost entirely conveyed by road.

Main roads and Village Roads.—As the bulk of the traffic is by road it is essential that these be kept in good condition. The main road from Trivandrum to Nagercoil runs through the centre of the taluk and branch roads run in all directions from this main artery. The following are some of the roads :

At 2½th mile from Trivandrum the road to Tiruvalliam joins the main central road. At the 6th mile the road to Vizhanjam, at the 9th mile Puvar road, and at 12½th Neyattinkarai Puvar road joins. Distance to Puvar 6½ miles from Neyattinkarai. At 13½ mile stone a road to Ottasekharamangalam joins. At the 15th mile stone a road to Kulathur Chavadi joins. Parachalay is at the 18th mile stone. Most of the village roads are cartable and the produce is conveyed to them by headload.

Nearest Seaport.—Trivandrum is the nearest place from which shipping can be done although Colachel and Puvar can also be used. If Puvar was developed much of the produce of the taluk can be sent by water to the larger ports direct.

Cultivation.

Wet land area.—13,164 acres.	Dry land.—77,011 acres.
Waste land.— 5848. acres.	No. of cocoanut trees.—
	724,000

No. of Jack trees.—105,000. No. of Palmyra trees.—76,000.
No. of arecanut trees.—3,56,000.

Pakuthies.

Name of pakhuthy.	Area.	Population.	Wet land.	Dry land	Waste land.
Karamkulam ...	4.90 sq. miles.	Total population of Neyattinkara Taluk is 1,87,700 persons. Total males. 91,794. Total females. 96,906.	19 acres.	2361 acres.	—
Kottugal ...	11.31 sq. miles.		569 acres.	6225 acres.	11 acres.
Tiruvallam ...	11.36 sq. miles.		741 acres.	5074 acres.	107 acres.
Kolla ...	5.35 sq. miles.		577 acres.	2533 acres.	2 acres.
Chengal ...	7.83 sq. miles.		746 acres.	3611 acres.	4 acres.
Kulathur ...	10.38 sq. miles.		799 acres.	52.12 acres.	5 acres.
Kunnathbukal ...	31.79 sq. miles.		1391 acres.	8515 acres.	440 acres.
Maranalloor ...	9.71 sq. miles.		926 acres.	4974 acres.	—
Marukil ...	6.31 sq. miles.		426 acres.	2720 acres.	5150 acres.
Nemau ...	11.39 sq. miles.		1455 acres.	4433 acres.	13 acres.
Pallichal ...	6.37 sq. miles.		565 acres.	2747 acres.	25 acres.
Adiyannur ...	7.60 sq. miles.		729 acres.	3467 acres.	1 acre.
Neyattinkara ...	9.71 sq. miles.		781 acres.	4518 acres.	4 acres.
Tiruvavattur ...	6.12 sq. miles.		326 acres.	2768 acres.	2 acres.
Parachulay ...	7.72 sq. miles.		553 acres.	2723 acres.	3 acres.
Ottasekura- mangalam...	50.15 sq. miles.		612 acres.	3332 acres.	2312 acres.
Perunkadavila ...	15.22 sq. miles.		902 acres.	6401 acres.	1133 acres.
Vilappil ...	12.11 sq. miles.		938 acres.	5599 acres.	733 acres.

Education.

GOVERNMENT VERNACULAR SCHOOLS.

No. of H. G. Schools 31.	No. of Boys 9082.
	No. of Girls 1272.
No. of L. G. Schools 9.	No. of Boys 804.
	No. of Girls 155.

AIDED SCHOOLS.

No. of H. G. Schools 1.	No. of Boys 331.
No. of L. G. Schools 102.	No. of Boys 6963.
	No. of Girls 2727

PARTIALLY RECOGNISED SCHOOLS.

No. of L. G. Schools 34, No of Pupils 1339.

GOVERNMENT VERNACULAR GIRLS' SCHOOLS.

No. of H. G. Schools.	2.	No. of Girls	725.
No. of L. G. Schools.	19.	No. of Girls	2591.

AIDED SCHOOLS.

No. of L. G. Schools.	3.	No. of Girls.	262.

BOYS' ENGLISH SCHOOLS.

Neyyattinkara incomplete H. G. School	IV Forms	184 Boys 20 Girls.
Kanjiramkulam H. G. School (Aided)	VI Forms	297 Boys 29 Girls.
Balaramapuram L. G. School (Unrecognised)	I Form	28 Boys 8 Girls.

GIRLS' ENGLISH SCHOOLS.

No Girls' schools have been started, and Girls attend the Boys' schools. The nearest schools are at Trivandrum.

INDUSTRIAL SCHOOLS.

Name of School.	Place.	No. of pupils.	Staff.	Subjects taught.
Sri Krishnavilasom Weaving School	Malayinkil	15	2 teachers	Weaving subjects.
Channi Weaving School	Channi	20	2 teachers	Weaving subjects.

Natural Products and their Utilisation.

Paddy and rice.—There are 13,164 acres of wet-land in the taluk or roughly one tenth of the area of the taluk. Most of the area yields two crops annually and the bulk of the produce is for local consumption or export to Trivandrum. The majority of the farmers are engaged in cultivation of other products such as tapioca, which is largely grown. This cannot be said to be the main crop as cocoanuts form a large part of the produce of the taluk. The paddy is husked locally but no power mill is used.

Cocoanuts products.—About 13,000 acres are under coconut cultivation and over 7,24,000 trees are growing. The main part of the coconut area is situated along the coast and the growth is prolific. Large quantities of cocoanuts

are obtained annually, and copra drying and oil pressing are carried on in all parts of the coast pakuthies. Coir making is not so well advanced owing to the lack of soaking facilities. Two or three possibilities present themselves here. Manufacture of dessicated cocoanuts : For this, the people must be instructed to cut the nuts at the proper time before they are too mature and a factory should be started to dry the nuts in the proper fashion and prepare them for export. There is a considerable demand for this commodity and if the business is put on a proper basis it should be a success with the wealth of raw material available locally.

Cocoanut products.—Copra making.—Copra making is largely carried on throughout the taluk and copra makers are found in Kotukal, Tiruvallam, Kulathur, Perumkadavila, Pallichal, Adyannur and also in Neyyattinkara. This is one of the main industries of the taluk and large numbers of people are employed. A great number of bullock driven oil presses are found, and in Karumkulam, Kottukal, Kulathur, Nemam, Neyyattinkara, Tiruvarathur and Parassala, this is a thriving industry. The oil made not only supplies local needs but is exported to Trivandrum and to the South. Large number of copra makers are found at Balaramapuram. The nut kernels are dried in the sun, and the artificial drying method on tables with fire below, as used in Central Travancore, is not done here.

Coir making.—It seems a pity that, in this taluk, brush making is not introduced as a cottage industry. There is a plentiful supply of coir which could be extracted as whisk with an extracting machine and also there is, in the southern portions, plenty of palmyra fibre. The difficulty of finding soaking facilities is great and this is largely a hindrance to the success of the industry. The following pakuthies are most interested in the coir industry *i. e.*, Tiruvallam, Pallichal, Vilappil, and Kottukal. The making of mats is very little done and it could well be introduced as a cottage industry in the coast pakuthies. Rope and fishing-net-making might be introduced in these places.

The cocoanut industries cannot be said to be nearly fully developed. One of the difficulties has already been mentioned and the other is the fact that transport is expensive by road.

Tapioca.—Tapioca grows in all parts of the taluk in large quantities, in fact, it is one of the largest crops

and forms a great foodstuff of the people. Large quantities are exported as dried slices. The most important pakuthies for this industry are Kunnathukal, Perumkadavila, Adhiannur, Kottukal and Tiruvallam. The root is taken and washed. It is then sliced into oval slices and dried in the sun on palmyra mats. It is also dried in rocky places on the rocks and this effects a much better drying agency. There is no doubt that tapioca flour-making would succeed in this taluk. A factory would find plenty of raw material available, and if it was placed on one of the rivers the water supply could also be assured. The fuel supply would be rather a difficulty and it would have to be carted for some distance. However, cheap and abundant raw material is available and there should be no difficulty in obtaining the same. Bulletin No. 8, of this Department shows the possibility of the industry in Central Travancore and it is equally possible, if not more so, to establish a successful factory in Neyyattinkara.

Palmyra products.—There are over 76,000 palmyra trees in the taluk and these are mostly confined to the southern portion. About 1,300 are recorded as being tapped for excisable liquor and about 20 % are used for jaggery and fibre manufacture. Probably between 15 and 20 thousand trees are tapped annually. The jaggery is manufactured in the cottages of the people by boiling the toddy in earthenware chatties. It is sold locally and also exported to Trivandrum and Nagercoil, the bulk going to the latter place. The fibre is extracted from the leaf fronds of the young trees and is sold to agents in the local market and is again sold by them to the fibre merchants at Colachel. The palmyra industry is discussed in detail in Bulletin No. 16 of this Department. As already mentioned in this report much could be done to enlarge both these industries. It seems a pity that so many trees are untapped and so much valuable raw material lost. A sugar factory could be established in South Travancore and would have reasonable chances of success if it was sufficiently well capitalised. Probably such a factory would be better if established further south than Neyyattinkara taluk, but, if such a place was created the excess supply of this taluk could be utilised. Palmyra-leaf-mat-making and basket-making are important cottage industries in this taluk. It is found in vigorous working condition in all parts of the taluk and large quantities are made and exported annually. The industry is carried on in a similar

fashion to the screwpine industry of Central Travancore, and the workers are chiefly the poor cottagers of the lower castes. The mats are made and offered for sale in the local markets. The average earnings of a mat weaver can come to as much as Rs. 4 to Rs. 5 per month, and this can be regarded as a subsidiary and auxiliary income to the worker to that obtained from the coolly work in agriculture and other pursuits. Many thousand of workers are engaged in this industry and they lack organisation in every way. All kinds of articles could be made including baskets, fans and many kinds of small and useful articles. The scope for the establishment of these industries on a cottage basis is set forth in our bulletin as fully as possible and what is required now is a co-operative depot in the taluk where instruction can be given and the industry properly organised, so that supply and demand are satisfied. The palmyra industry is one with enormous possibilities and is one which can easily be worked up. There is ample scope for many of the industries to be worked on a cottage basis and if brush-making, basket-making, match-making match-box-making, fan-making, are all properly taught these industries can be successful in the homes of the people. It must be remembered that cottagers in these places are already skilled in mat-making and it will not take much tuition to get their skilled hands to work in other ways also. The palmyra products are not yet fully utilised and they are badly in need of proper organisation so that this can be done.

Minor products.—Amongst the numerous minor products can be mentioned Gingelly from which the oil is extracted locally, Bengal gram, and arrowroot which can be cultivated to a far greater extent and from which the flour could be extracted at the tapioca factory. Pine apples grow in large numbers and ginger, yams, indigo, cholam, jacks, mangoes, plantains are also cultivated to supply local needs.

Nutmeg.—Nutmeg grows in this taluk and is used for cooking purposes. Much of it is exported to other parts of the State and also there is a good local demand.

Pepper.—Pepper was formerly largely grown in the taluk, but in common with other parts of the State it has declined. The most extensive cultivation is now [found in the three pakuthies of Nemam, Neyvattinkara and Perumkadavila. Several of the other pakuthies also cultivate pepper and pepper drying is done as a cottage industry in Neyvattinkara and other places. Much of it is consumed

locally but there is also a considerable export trade to Alleppey. This pepper cultivation and pepper drying could be greatly increased and there is no reason why the pepper corns should not be ground into powder and bottled locally for export. Already the beginnings of the industry have been demonstrated by Mr. G. P. Pillai, who has made pickles and preserves from local materials for war purposes. If this was built up under proper supervision, such as it is at present, the pickle-making, fruit-preserving and pepper-drying industry would succeed.

Aloes.—Bulletin No. 9 of this Department sets forth the possibilities of utilising the large quantities of Elephant Aloe Fibre which grow at Parachalay and the surrounding districts. It also grows on the waste lands near Poovar and it can be cultivated for dividing purposes as hedges, etc., to mark land boundaries. The process of extraction of the fibre which is done here differs greatly from that of Shencottah and other places. Whereas in Shencottah the tender leaves are taken and, after being bruised by a wooden mallet the fleshy matter is scraped away with a knife, in Parachalay the soaking in water of older leaves is carried out, and, although this is more laborious, it yields a much longer length of fibre. The leaves of this plant reach a length of 6 to 7 ft. and are correspondingly wide in proportion. If the leaves are soaked and beaten with a wooden mallet, in the same style as coir is beaten out, they yield fibre of extraordinary tenacity. It has also the property of being white in colour when bleached by the sun and it can be spun into twine or rope of considerable tensile strength. The twine thus obtained is superior to the country variety and is stronger than the imported variety which we hope it will replace. The price is very moderate and runs out at from 3 to 6 annas per pound for superior made article. The rope made from this material has a fine appearance and is very strong. It is most useful for tent ropes, for punkah ropes, and other uses entailing tensile strength and hard wear. The ropes and fibre have been placed on the market in India and in Europe, in both cases, with excellent results. This department has now been able to establish the industry on a firm basis in Travancore. At Parassalay a company was formed by the local people under the name of The Sri Gopal Industrial Company, at our instance. We secured them help financially in order to finance them. The initial order was at Rs. 80 a candy, and now the market has so

spread that orders to carry on the industry permanently have been registered. Later experiments in the manufacture of twine of a better type have also been carried out with great success and it is hoped before long that this can be put on the market. Experiments have also been conducted to obtain a soft variety of fibre suitable for weaving into cloth. The first attempts were not wholly successful, but a degree of softness was reached where the fibre could be woven into superior gunny bags. Further experiments are now proceeding, the ultimate aim being imitation silk. The aloe industry badly needs one or two things: (1) Good soaking tanks, (2) Good machines for the extraction of the fibre. It is said that the most efficient soaking is done in a stream bed with running water passing over it, and this is scarcely possible in this taluk. Fibre extraction machines, if introduced, would greatly help to build up this industry and it would be worth while to demonstrate the use of a cheap machine for this purpose.

Indigo.—Indigo is not grown on a large scale, the land which would cultivate it best being given up to other crops. It is found in Neyyattinkara, Kunnathukal and Perunkadavila pakuthies. There is not much room for expansion in the industry and the area available for the extra cultivation is small.

Kyvan.—This is found largely in the forests and the small branches are collected by the people of this taluk and the neighbouring pakuthy of Karamanai. The outer bark of the trees is taken and after soaking, is beaten out into fibre in the same way as also fibre or hemp. The result is that a fibre is produced which can be spun into yarn and woven into a kind of gunny and a substitute for canvas. This Industry has been carried on by a few people numbering no less than 200, on the banks of the Karamanai river. It is declining for want of proper development and organisation. The Forest Department charges only annas two per bandy load as Forest dues and the fibre when made and woven finds a ready sale. The great trouble is that the weavers do not use up to date looms and the material woven is coarse, too narrow and not pliable enough. What is required is that instruction should be given in better spinning of the yarn and in this connection, undoubtedly, power spinning would be the best. Secondly looms of a modern character and capable of producing a softer and wider cloth should be introduced. The people have no capital, but in this

industry local capital from other sources will be forthcoming if only proper organisation is carried out. A considerable number of gunny bags are used annually for salt transport, and it is a pity that the bags have to be ordered from Bombay when local materials could be developed with a little trouble and would do as well.

Trees and Timber.—The following trees are found in this taluk, pinnai, tamarind, marovotti, ilippai, jack, arecanut, guava, anjeli, palmyra and cocoanut. These are the main trees which grow in various parts of the district.

Minerals.

Graphite.—Graphite is found in Kunnathukal, Perumkadavila, and Tiruvallam pakuthies but in no case are the deposits fully investigated or worked.

Iron Ore.—This is found in Perumkadavila pakuthi in fair quantity and is probably some form of oxide. It is not utilised in any way.

Existing Industries.

Agriculture.—This forms the main industry of the taluk but different from other places the paddy crop does not engage the attention of so many men. There are over 13,000 acres of paddy land in the taluk and this comprises about one-tenth of the taluk area. It is estimated that about 36,000 men can be put down as farmers on a large or small scale and there is a corresponding number of agricultural labourers and coolies. The crop of paddy is obtained twice annually and the tapioca crop also engages the attention of large numbers of other people. In fact, rice and tapioca can be stated as the two main crops of the taluk. With regard to economic statistics, it is found that the cost of living for a farmer's family of 7 persons is between Rs. 1-12-0 and Rs. 2 per day and to meet this the average income ranges from 400 to 500 rupees per month. Coolies earn about Rs. 5-8-0 per month when in full work, but it is probable that in many cases much less than this is gained. The average daily wage is about 5 to 6 chs. and almost all of this is spent in food and maintenance. The implements used are imported from Quilon and Trivandrum. Some even come from Tinnevely. The local blacksmiths are above the average, and if they were reliable and punctual could do most of the work. Training in the manufacture of farm implements is necessary. Vegetables are grown in all parts of the Taluk for home consumption.

Over 60,000 persons in the Taluk can be put down as agricultural workers of one kind or another.

Coir making, etc.—This has already been fully discussed. What is needed is better soaking facilities or the introduction of coir extractors on a large scale.

Weaving.—This is a highly important industry in this Taluk and weavers are found in almost every pakuthy. Two weaving schools are found in the Taluk, one at Neyyattinkarai, the Malayankil Sri Krishnavilasom Weaving School, and the other The Chani Weaving School. The former has 15 pupils and two teachers and is assisted by Government. The latter has 20 pupils and 2 teachers. The local weavers are skilled, and weave cloths for home consumption. The chief weaving centre is Balaramapuram which is 8 miles from Trivandrum on the main road. There are some hundreds of weavers working here and seven large merchants for the supply of yarn and the purchase of cloth. In 1093, one merchant alone distributed nearly 5,000 bundles of yarn of all counts and it is estimated that between 40 and 50 thousand rupees worth of cotton is used annually at this centre alone. The fly shuttle loom is used and finer cloths are woven as well as the coarser ones. The cloths are brought up by merchants and sent away for sale chiefly in Trivandrum. The system here is the same as elsewhere, and the workmen live by taking advances from the merchants and in return giving the cloths. The state of the workers is the same here as in other places, namely, always on the verge of poverty. This has been fully dealt with in the Vilavancode report, and what is said there, is equally applicable in this connection. At Neyyattinkarai, Mr. G. P. Pillai has a private loom where he weaves excellent twill for shirting, etc. There is a large demand for this kind of cloth, and it is a pity that the local weavers do not weave more of this variety. Isolated weavers and small communities are found in all other parts of the taluk. The question of the reorganisation of the weaving industry and its future is discussed in a separate report. (See Agasteeswaram Taluk).

Mat-making—Palmyra mat making is done as a cottage industry in all the southern Pukuthies of the taluk. It has been already discussed under palmyra products, and, in view of the thousands of workers engaged in the industry, it is a pity that it is not developed on more modern lines. Basket making, etc., could be introduced.

Pottery.—Pottery is made in the three pakuthies of Kulathur, Neyyattinkara, and Nemam. At Thozhukkal one mile from Neyyattinkara, a community of about a hundred and fifty persons earn their livelihood by this industry. The quality of pots made here is well known, and it is a thriving concern. Up to the present, there has been no attempt to organise the industry on a proper basis but now the Nair Sahodara Sangam is taking up the matter and endeavouring to place it on a business basis. The pottery is done by hand only and no machine driven turn-tables are used. Possibly, the introduction of a small power engine would greatly help to build up this industry. Instruction should be given in the art of glazing the pottery, and this will be highly successful, if placed on the market. With a little attention, this small industry could become very prosperous, and organisation and expert advice together with proper training are the essentials.

Blacksmiths and Cutlery.—The blacksmiths are found in almost all pakuthies of this taluk, but mention must be made of those which are of outstanding merit. At Neyyattinkara, Parassalai, Tiruvarathur and Adhyannur the workmen are skilled not only in the ordinary blacksmiths' work but in the making of knives and cutlery as well. Large sales are made of this class of goods, but it is difficult to assist the men owing to their lack of business ability. Cutlery, scissors, etc., are made at 3 or 4 places in the State, namely, Neyyattinkara, Kannamangalam, in Mavelikara Taluk, and at Warkalay, and to a lesser degree in Haripad and Paravoor. The workers are hereditary skilled blacksmiths and they all turn out good quality of articles, if they wish. They have no idea of the time taken and conform no estimate of the cost of production of their goods. They lack capital and can only work if advances are given. It has been demonstrated by actual orders that there is a large market for these goods, and we have been able to keep one firm alone in full work for over a year and orders are still coming in. The local made scissors lack finish and are not plated like the foreign article. Experiments have been made with local made scissors which were plated and these were found to realise a higher price and be equal to any foreign made article. The goods need advertisement, and if it was possible to get a company to unite the four blacksmiths above mentioned and pay them regular wages the quality of the goods could be uniform and the industry built up. It is insufficient for these skilled workmen to

make razors and goods for exhibition purposes which take them a long time and place the price above that current in the market. They must be instructed to make articles for commercial purposes, pocket knives, pruning knives, rubber tapping knives, scissors, chisels, etc. This can only be done by co-ordination of the various workers in the industry and if instruction is given in an industrial school it is more or less unnecessary to teach these skilled workmen the elementary parts, but what they need is guidance and information as to the method to be employed in order to improve their processes and to make the goods required by the market. Agricultural implements could also be made and would be of great advantage to the people engaged in the cultivation of the land. The demand locally for all classes of these goods which can be made cheaply is very good. The black-smiths earn from 10 As. to over one rupee per day according to their skill and if in constant work, as they could be if reliable, they can make a good living.

Bronze workers.—Bronze workers exist in small numbers and are found in two *pakuthies*, namely, Neyyattinkara and Kulathur. Their work is entirely to satisfy local needs and their methods similar to those in use elsewhere Rs. 13/-, to Rs. 15/- can be made by a workman on full duty. The raw materials are purchased locally and are chiefly scraps of brass from broken and old vessels. The method of manufacture is the same here as elsewhere. (See later.)

Embroidery.—Under the direction of Mrs. Foster of the L. M. S., Parassala, some hundreds of women have been instructed in the manufacture of embroidery and are actively engaged in it as a cottage industry. The Parassala lady acts as Superintendent and not only obtains the orders, apportions the work, collects the finished goods and pays the work people, but instruction is given in new patterns and the work is financed from the central depot. In this way a cottage industry has been built up which employs large numbers of women in a clean respectable calling which they can follow in their own homes. At present the industry is limited to the members of the L. M. S. and its popularity and social amelioration have made it worthy of further development. Bulletin No. 3 of this department has made the fullest suggestions with regard to this industry. It is possible for a woman to earn Rs. 3 per mensem by her spare-time work and thus add to the family income.

Fishery.—The coast pakuthies are all engaged in fishery and some excellent fishing grounds are found. At Vizhinjam, there is an excellent little bay so that the boats are able to go out practically all the year round. In Thiruvavarthur, Karinkulam and Kottukal fishing is carried on a large scale. The hundreds of fishermen employed are very poor, and, if through rough weather or other causes, they are unable to go to sea then they have little or no food. The fishing is done by cattamarans and boats with nets of local manufacture. The fish is exported by headload to Trivandrum, Neyyattinkara and other places where it is offered for sale in the local markets. A certain amount of fish curing goes on in the sun and a further amount of fish manure manufacture by burying the fish is also carried on. The economic condition of the fisherfolk is very bad. They are largely in the hands of wholesale merchants who are also middlemen and money lenders. The fishermen, when unable to go out to sea, borrow money rather than starve and this is taken back in the form of fish when the catch is brought to shore. High rates of interest are charged and therefore the fishermen see little return for their labours. Before anything can be done either by co-operation or otherwise it is essential that these people be released from their obligations to the merchants. A co-operative society would scarcely suffice as the majority of the men are uneducated and ignorant. Education has tended to make them desire social elevation and leave their arduous calling for something of an easier nature. It is therefore evident that the situation is one of extreme difficulty to handle. If improved methods of fishing might be introduced and cottage industries taught, it would employ the people in monsoon time when they cannot work otherwise. Almost all kinds of fish common to the West Coast are obtained, Shanks, scer, pomfret, lobsters, prawns and sardines are obtained together with any others. A suitable cottage industry such as shell button manufacture or brush making might be introduced to alleviate the distress caused by circumstances which cannot be controlled by the people themselves.

Arecanut.—There are about 3 lakhs of arecanut trees and considerable work is done in cutting and drying the nuts for export. Particularly this is the case in Neyyattinkara pakuthy where it is carried on as a cottage industry.

Basket-making.—In Pallichal pakuthy, there is a small community of basket-makers. They obtain their raw materials

from the neighbouring forests and cut and collect them themselves. Mats and baskets of various patterns are made and sold locally. This industry could be easily built up into something bigger and a depot for cottage industries could be established to widen the market and assist in instruction etc., Basket makers are also found in Thiruvallam pakuthy in small numbers.

Possible Industries.

Dessicated cocoanut.
Palmyra brushes, Mats, etc.
Pepper drying and Pickles.
Aloe Fibre.
Kyvan,
Pottery,
Cutlery,
Basket-making,

These industries have already been fully discussed and can be easily developed on the lines indicated. There is also scope for the reorganisation of the weaving industry, and it is to be noted that for these cottage occupation a proper organisation is necessary.

Possible Industries.

Tapioca flour.—At present much of the tapioca is sliced and dried for export but a far bigger market can be found for the flour if such is made. The Director of Agriculture, states that by efficient manuring the production of the State on the present line can be increased three-fold. This is quite true, and thus if a large demand arose in the Neyyattinkara taluk a greatly enhanced supply could be obtained by better cultivation. The methods of extraction of both tapioca and arrowroot flour have been set out in Bulletin No. 8 of this Department. A small factory costing Rs. 10,000 and with sufficient additional working capital could work the industry quite successfully and also the market for the flour is assured. The idea is worthy of attention here.

Button-making.—Button and bangle-making from shank shells is an industry which could be worked amongst the fishermen on a cottage basis. Bulletin No. 10 of this Department has fully set out this industry. Already Government has taken action in the matter and is hoped that their instructions will be carried out soon and the industry established.

Casheu nuts.—In common with other parts of the State casheu nuts grow in abundance here and can be developed in the various ways. A recent report shows that in a

sample of the bark 9.43 % of tannin matter was present and the proportion of tannin to non-tannin matter is almost equal. There are not many skins available in this taluk for tanning and perhaps if some use could be found for the nuts it would be better. Research work regarding the extraction of the oil in the nuts and its economic value should be undertaken.

Foodstuffs used and available locally.

Rice, tapioca, cocoanut, jack, mangoes, peas, grams and vegetables. Fish is consumed largely.

Economic statistics.

In all occupations excluding merchants, landowners and professional gentlemen there are about 65,000 skilled workers of which at least 60,000 are skilled agriculturalists. A rough estimate of the artisan population is as follows:—

Name of craft.	No. of workmen.	Wages, etc.,
Carpenters	1000	8 As. to 10 As. per day.
Masons	300	17 Chuckrams per day
Blacksmiths	150	8 As. to 12 As. for an ordinary workman one (1) Rupee for a highly skilled man.
Weavers	1500	Contract work. 7 or 8 Rupees per month.
Potters	175	Rs. 5 to 7 per mensem.
Goldsmiths	60	Contract work wages vary.
Oil mongers	500(about)	
Stone workers & other artisans	some hundreds	Rs. 15 per month the maximum average, or As. 8 per diem.
Coolies	some thousands	5½ to 6 chuckrams per day.

Cost of living:—CULTIVATOR'S FAMILY. Rs. 1 As. 12 to Rs. 2 per day for a family of 7 members.

COOLY'S FAMILY.—About 6 chuckrams per day and compound produce.

SINGLE PERSON.—About 9 chs. per day for middle Class person.

Number in family.—*CULTIVATOR.* 7 persons on the average.

COOLY.—4 to 5 persons on the average.

Number of people qualified as voters *i. e.* paying over Rs. 50 per annum as land tax, is 129. Number of professional people (Vakils, Officials etc.) about 500.

Existing Co-operative Society.

<i>Name of Society.</i>	<i>Working capital.</i>	<i>Profit in 1092.</i>	<i>No. of members.</i>
The Parassala Mission Agents' Co-operative Credit Society. Ltd.	Rs. 140	Rs. 2 As. 4.	30

Joint Stock Companies.

<i>Name of Company.</i>	<i>Reg. Office.</i>	<i>Capital.</i>
Keraliya Nadar Samajam.	Venganoor	Voluntary contribution.
The Travancore Xian Sadhu Jana Vidya Abhivritthini Sangam.	Nemam	Do. Do.

Capital and Remarks.

Very little money is free for investment as it is mostly locked up in land and unless something can be done to release it improvements can only be very slow. Large land owners and wealthy men are very few and even these have their money profitably invested already. There is very little co-operation and the poor people who would be most benefited by co-operative efforts are poorly educated and indebted to others in many cases and are therefore unable to act for themselves. It is probable however, that a proper demonstration and encouragement will help in many ways and that some of the wealthier people will be persuaded to assist in the development of the industries of the taluk by lending their money. There is an atmosphere of mutual distrust. Also every man expects high rates of interest for his money and in many cases an investor is not prepared to allow another person to administer and manage a concern in which he has invested his money. This means often undue interference with the managing expert, on the part of those whom he serves and with such lack of confidence it is difficult for industries to succeed. I have enumerated above the resources of the taluk which I have investigated but there are many

more in the forests and elsewhere which could be developed. Scientific research is necessary before their commercial and economic value can be stated. Of these many fibres such as Rosil, Aloe, Kyvan, may be mentioned. Brush-making, mat and basket-weaving, embroidery, are all possible cottage industries and the report contains suggestions for others. A central depot and school of instruction would greatly help. Capital for big concerns would be difficult to raise but there is no reason why sufficient money to run a small tapioca flour factory could not be collected.

CHANGANACHERRY TALUK.

Area	134.29 square miles.	Population.	93873.
No. of Houses.	—19,124.	No. of Voters.	148.
No of Pakuthies	14.	Taluk Town.	Changanacherry.

Location.

Division.—Forms the Southern most Taluk of the Kottayam Division.

Boundaries.—NORTH.—Kottayam Taluk.

EAST.—Peermade Taluk.

SOUTH.—Tiruvella Taluk.

WEST.—Ambalapuzha Taluk.

Railway.—The nearest railway station is Kottarakarai, which is $40\frac{3}{4}$ miles from Changanacherry Town along the main central road. Probably Quilon and Ernakulam are more generally used than Kottarakarai because of the facilities for reaching them by backwater.

Backwaters and Rivers.—The Manimalai River establishes direct communication with Thiruvella, Alleppey and the Vembanad lake. The distance to Alleppey is 16 miles and is entirely by river and canal. A branch of the Manimalai river runs from near Muttar to the Vembanad Lake and the Neelamperur Pakuthy has the lake as its northern boundary. The Manimalai River also forms part of the eastern boundary. Smaller streams run through the taluk connecting the central portions and these are navigable for vallam traffic in the wet season. A regular service of motor boats is run to and from Alleppey and this is the main route for traffic.

Main roads and Village roads.—The Main Central Road runs direct north and south through the Taluk and cuts

through Vazhapally, Changanacherry, and Kurichi Pakuthies on its way to Kottayam, which is only 12 miles from Changanacherry town. Tiruvella town is about 6 miles south. River traffic is good and the Kottayam-Mundakayam road cuts the northern portion of the Taluk. The village roads are on the whole fairly satisfactory although in monsoon time many of them are difficult for transport. Water transport, however, is good at this time so that it can be said that the Taluk is well served for communications.

Nearest seaport.—The nearest seaport is Alleppey and the distance is a little over 16 miles entirely by river and canal.

Cultivation.

Wet land area, 25,947 acres. Dry land, 57,091 acres.
No. of cocoanut trees, 311,500 trees.

Pakuthies.

Name of Pakuthy.	Area. sq. miles.	Population. persons.	Wet land. acres.	Dry land. acres.
Muttar.	4.58	7220	2459	287
Ramankara.	4.39	3270	2482	257
Veliyanad.	7.52	4980	3911	423
Nilamperur.	4.23	2350	2381	623
Channankarai.	4.46	2310	2497	199
Kurichi.	6.02	4100	1341	2064
Vazhapalli, West.	5.66	4130	2862	623
Vazhapalli, East.	5.92	7540	967	2549
Changanacherry.	6.61	8310	2728	1207
Madapalli.	17.25	11820	1654	8723
Pudupalli.	18.88	17130	2153	9603
Nedumkunnam.	17.99	8950	284	10989
Vazhur.	21.61	7920	144	13383
Vellavoor.	9.17	3830	81	5574

Education.

GOVERNMENT BOYS' VERNACULAR SCHOOLS.

No. of H. G. Schools, 9. No. of Boys, 2186.

No. of Girls, 320.

No. of L. G. Schools, 28. No. of Boys, 3287.

No. of Girls, 1252.

AIDED VERNACULAR SCHOOLS.

No. of H. G. Schools, 6. No. of Boys, 616.

No. of Girls, 82.

No. of L. G. Schools, 35. No. of Boys, 2184.

No. of Girls, 1035.

GOVERNMENT GIRLS' VERNACULAR SCHOOLS.

No. of H. G. Schools, 2. No. of Girls, 419.

No. of L. G. Schools, 5. No. of Girls, 455.

AIDED GIRLS' VERNACULAR SCHOOLS.

No. of L. G. Schools, 5. No. of Girls, 620.

Boys' ENGLISH SCHOOLS.

Name of Schools.	Grade.	No. of Forms.	No. of Pupils.	
			Boys.	Girls.
Puthupally, English School.	L. G.	3	74	16
St. Berchman's Eng. School.	H. G.	6	299	...
Nedumgadopally, Eng. School.	L. G.	Prep.	18	7
(Unrecognised).				
Karnkachal N. S. Society.	"	2	91	13
Vakathanam, Eng. School.	"	1	48	6
(Unrecognised).				

GIRLS' ENGLISH SCHOOLS.

Changanacherry. St. Joseph's. H. G | 5 | 156 | Girls.

INDUSTRIAL SCHOOLS.Vazhapally Devivilasom. Weaving School. 27 pupils. 3 teachers.
Weaving cotton yarn, using fly shuttle.**Natural Products and their Present Utilisation.**

Paddy and rice.--The paddy grown is largely used locally. There are nearly 26,000 acres of wet land in the taluk comprising a little less than a third of the total area of the taluk. Practically the whole of this area yields one crop per annum. Formerly a rice mill was working in Changanacherry but the owner found it more profitable to utilise the engine for pumping purposes and it was discontinued. Mr. P. Kurian, has again opened a rice mill in Changanacherry utilising a small oil engine. The husking was either done in Alleppey or by hand labour. There should be plenty of scope for the mill if the local people will fully patronise it for the extraction of their rice. A husking mill driven by mechanical power is working in Pudukkuthy.

Cocoanut products.—The western portion of the taluk contains practically the whole cocoanut area which amounts to about 5200 acres. Over 3 lakhs of trees grow in the taluk. The bulk of the coir extracted is exported to Alleppey. The nuts are usually gathered twice a year but owing to lack of soaking facilities in brackish water many of them are used for fuel. Owing to the war, the industry has declined, but this will revive when the market is open again. Machines to extract coir are badly needed in this taluk, and if capitalists at Changanacherry were to set up a proper factory it would be a successful enterprise. Coir making is carried on chiefly in the following pakuthies:—Ramankara, Muttar, Pudupally, Velianad, but even here the full extent of the industry has not been reached and much waste goes on. Copra is made in most of the above pakuthies and is exported to Alleppey for oil pressing. Brush-making could be undertaken if whisk was manufactured and the raw material to be worked upon.

Tapioca.—Tapioca is grown throughout the whole taluk and not only are the local demands met, but much is exported to Alleppey, Cochin and Ernadulam. It is from this area that a large amount of tapioca can be obtained for the extraction of flour and particularly the pakuthies of Madapally, Pudupally, Nedumkunnam, Vellavoor, and Vazhur, have large areas of tapioca land from which the yield can be greatly increased. Tapioca is the staple food of half the population of the taluk and if proper manuring was done and an increased area were under cultivation this Taluk could easily supply both the local needs and those of a factory. Probably Changanacherry town is a good place for the establishment of a factory, since the communications are good and the water-supply liberal. This is certainly an industry that should receive attention in this taluk.

Arrowroot.—This grows wild in the taluk and particularly, in the neighbourhood of Changanacherry. It also grows at Pudupally, Madapally, and Karugachal in large quantity. The extraction of arrowroot flour is at present carried on as a cottage industry on a small scale and is sold as a foodstuff in the local markets. Fairly large quantities are gathered for export and are sent by backwater to Alleppey. The root is sliced and dried in the sun previous to export. If a tapioca-flour factory was established at Changanacherry, then it could also be utilised for the extraction

of arrowroot flour for which the demand is assured. Quantities of arrowroot flour are imported into India today and with a little organisation the industry can be started and worked profitably in Central Travancore.

Sugar-cane.—This grows along the rivers and is found in the pakuthies of Kurichi, Vazhapally, Pudupally, Nedumkunnam, Vazhur, and Karugachal. The cultivation at present is confined to the river banks and there is plenty of room for a great increase. Not only can the area be increased but the rate of production can be greatly enhanced by efficient manuring and scientific farming. At present the sugar cane is crushed locally and the juice is turned into molasses. This is made into jaggery and partly sold locally and the rest exported to Alleppey and other places. The establishment of a small sugar factory at Changana-cherry would give an impetus to the cultivation as well as supply local requirements. The great difficulty with such a concern is its dependence on the local ryots who raise the price of the raw material when they know that the factory must have it in order to go on working. Further, the factory must be run on scientific lines and to do this expert training is essential. It is therefore necessary that local men should be trained to carry on this work before a factory is established. A large sum of money should be set aside for the working capital and it will be necessary to follow the usual custom of giving advances to the ryots; otherwise the factory will not be able to secure raw materials.

Plantains.—Plantains and bananas are grown largely in all parts of the taluk and large export is carried on to other places. Whilst the fruit is exported the sheath of the stems is not utilised at all for fibre extraction. The introduction of fibre extractors of a cheap character as suitable for the use of ryots with smaller means would prove a great advantage. The demand for the fibre is great and £. 20 per ton could be realised in Europe before the war. Besides this, a chemical softening process renders the fibre of the nature of artificial silk and the local weavers could be encouraged to use this with great advantage in the place of cotton. The preserving of plantain fruit, the manufacture of plantain fibre, the production of alkaline manure from plantain skins could all be subsidiary industries so that practically no waste would be entailed. The cultivation should be done over large areas so that the supply might be adequate to the demand.

Rubber.—Small plantations are found in the eastern part of the taluk particularly in Pudupally, Vazhapally and Kuruchi. These are small concerns and are only worked in a small way, but there is room for expansion of the cultivation.

Other products.—Changanacherry is the great market centre of Travancore for vegetables of all kinds and large quantities are exported to Alleppey and other places. Practically all kinds of indigenous vegetables and fruits are available, and this would be an admirable centre for a fruit preserving factory, and also, if the sugar industry was properly worked up, would be highly suitable for the manufacture of jams and jellies.

Trees & Timber.—Jack, mango, pinnai, marotti, odum, anjeli, tamarind and perumaram, are found in fairly large quantities in the taluk.

Minerals.

Mica.—Mica is found in small quantities near the Chalakal canal.

Kaolin & Marcasite.—Kaolin and Marcasite are found in Changanacherry town. The kaolin is an impure variety.

Clay.—Clay is found near the town and is highly suitable for pottery and tiles.

Laterite.—Laterite is also found in the Changanacherry town and is quarried for building purposes. Laterite bricks are made and used locally. Export is also carried on by means of the water. It is said that granite is available in the neighbourhood but I have been unable to verify this statement.

Existing Industries.

Agriculture.—An estimate of a rough character as to the importance of agriculture in the taluk can be seen from the following figures. The area under wet land cultivation is about 26,000 acres or roughly one third of the taluk. The number of cultivators owning small estates from which they derive their living is about 5000 and there are some 20,000 agricultural labourers who can be classed as skilled workmen in this industry. The cultivation of paddy is the main work but there are large areas under tapioca and other vegetables and roots. Changanacherry is well known to be one of the largest vegetable markets of the State and considerable export of all kinds of edible goods is carried on to other

places. The average income of a small landowner is between Rs. 400 and Rs. 500 per annum and an average family of such a person will have six members. The monthly expenditure comes to between 25 and 30 rupees and it is seen that he has little balance left for saving and investment either for agricultural or industrial purposes. In many cases borrowing is resorted to and any unforeseen misfortune to the crops renders him bankrupt. Most of the money is locked up in land and very little capital outside the town limits is available for industrial and commercial development. Cooly labour is fairly cheap, but here, as elsewhere, is not constant and reliable. Only 20 days per mensem are the maximum days for which one of these men can be expected to work. Agricultural implements are supplied chiefly from Alleppey and other places and the local artisans do not supply the local needs. It seems a pity that skilled workmen are unable to repair and manufacture the simple articles used by the agriculturalists.

Coir and copra.—This has already been mentioned under cocoanut products and possibly a survey of the industry in the various pakuthies would prove instructive. The nuts are cut twice per annum.

Ramankara.—The cocoanut tree is found in almost all compounds, and water communications and supply are fairly good especially in the monsoon time. Possibly a broadening of the canal would help to further the industry of the pakuthy. Very little business is done in copra and coir-matting, brush-making, copra-manufacture, could all be worked up here to the local advantage.

Muttara.—There are great many cocoanuts in the gardens and compounds but this is not a big industry in the pakuthy. In fact the area under cocoanut cultivation is small. Coir and copra-making and oil-pressing could be carried on.

Velianad.—Copra-making is carried on very largely in the pakuthy, and there are many oilpresses also. The present cost of 1000 cocoanuts in this pakuthy is Rs. 40. Coir manufacture is very little done and if machines were introduced for coir-extraction it would be of great local benefit.

Nilamperur.—Very little cocoanut land is found and those produced are chiefly used locally.

Channankarai.—Copra is exported from this pakuthy to Alleppey by water as it is situated very near to the Vembanad lake. Coir-making is done on a small scale.

Kurichi.—There is a large area under cocoanut cultivation, and coir making etc., form the chief occupation of the people after agriculture.

Vazhapalli.—Although cocoanuts grow excellently here, the facilities for soaking are not good, and in consequence there seems little chance of developing it unless coir extractors are introduced. Copra is exported from this pakuthy to Alleppey and fetches Rs. 45 to Rs. 80 per candy according to the demand in the market.

Pudupalli.—Copra-drying for export to Alleppey is done largely in the pakuthy and the price of cocoanuts is Rs. 45 per 1000.

It will be seen from the above that the coir industry is not nearly fully developed, and the chief reason is that there is a shortage of water for soaking. The canals are often closed for traffic in the hot weather owing to shortage of water and the local ryots state that broadening and deepening are necessary before they can fully develop their cocoanut resources. It is in this taluk that coir extractors are highly necessary, and possibly, if a good machine was installed it could deal with a large proportion of the produce of the taluk. An oil-mill could possibly work successfully here. The manufacture of acetic acid from cocoanut shells could also be done here successfully. The present price of the shells is only Re. 1-1 per 1000. This would greatly assist the success of the project.

Weaving.—This is not an extensive industry in the taluk, but the local people are now attempting to introduce the industry. An institution has been started at Vazhapally, and besides the skilled workmen a school has been founded in connection with the H. G. V. School. Twenty-seven people have been enrolled and a capital of Rs. 2,500 subscribed. 12 looms are working and the yarn is bought from Quilon and Alleppey. Government aid has been accorded to the institution. There are also some isolated weavers scattered about Ramankara pakuthy and these people weave towels and cheap cloth. The price of their cloths is 8 as. each and they have a local market.

Bronze Workers.—There are 100 families of bronze workers in the Vazhapally pakuthy and also in Changanacherry. Workers in copper, brass and bronze are found throughout the whole district. All kinds of cooking utensils and domestic appliances are made. The copper for the work is obtained from Alleppey and other places as old scrapes and disused pots. The price paid is 16 chs. per pound and the ordinary skilled workmen can earn as much as Rs. 15 per mensem. The sales of the goods are effected largely in the Kottayam and Meenachil taluks. The method of working is the same in all cases. The moulds are made of crushed broken earthenware pots and cow-dung. After making they are coated with wax and the molten brass and bronze is poured in. The wax is melted and the required shape obtained. Polishing is then done by ashes and other local materials and the goods are ready for the market. There is no organisation about the community and each individual makes and lives for himself. If a central depot and school of instruction was found, it would be possible to work up this industry in many directions. A regular supply of raw materials could be obtained and wider markets established. Other classes of goods could be manufactured and the industry opened out in new channels. To accomplish this, tuition and regular work are necessary.

Sugar.—This has already been discussed fully, and molasses-making from the local sugarcane goes on in the following pakuthies. In Kurichi sugarcane grows fairly well, and in Vazhapally, Vazhur, Nedumkunnam and Karugachal sugarcane is also cultivated. At Pudupally, the cane grows well, and is made into molasses which is sold at the rate of Re. 1-8 per thulam of 16 lbs. The prospects of a small factory have already been discussed and the industry is one which could be attempted here with success.

Soap manufacture.—A small soap factory was working in Changanacherry town, but it was only on a primitive scale and unscientific. Great credit is due to the promoters for their work, but their soaps were not made on any definite plan. The demand is fairly good locally, and the quality is also fair. If more scientific methods were employed and a standard variety of soap produced there is no reason why the industry should not be successful on a large scale. What is really required is expert trained men to manufacture and to manage the business. The present factory has demonstrated

the suitability of the town for soap-making, and if this was taken up with trained men and adequate capital along side an oil-mill for which there is plenty of raw material the success which has attended the smaller factory is a guarantee of the progress of the larger. If a local man was trained and a local company formed, the work could easily be carried on.

These remarks on Soap manufacture have already been realised and a proper factory established in Changanacherry during February 1919. A good building has been erected and the power is supplied by a 10 H. P. Steam engine. A boiler has been installed to supply steam for the engine and also for boiling the oils. The cocoanut oil required is to be expressed from the copra in the same building and an equipment consisting of 6 mortars, mechanically driven, has been set up. One decorticator, one stamping machine, and boiling vats complete the factory. About Rs. 50,000 has been invested. The factory is under the control of a trained soapmaker from Calicut and the project has plenty of working capital also. There is every chance, therefore of its being a success if carefully managed. An iron foundry is also to be started by the same firm, but they would be wise to make the present factory flourish before starting in other directions.

Pottery.—Changanacherry is a large centre for the collection of pottery of all kinds. Clay exists in many places in the taluk and is utilised freely. There is plenty of scope for the manufacture of glazed pottery of all kinds, and this could be used as a medium for packing the preserved fruits already mentioned in this report. All kinds of utensils could be made, and proper capital would be forthcoming, if trained and expert workmen and foremen are available. The need for skilled potters properly trained in up to date methods is felt not only here but throughout the whole State, and, with the good clay at our disposal, this training should be given so that it can be utilised to the best advantage.

Fishery.—Few fishermen who work in the backwaters and in the lake are found. Many of these are not entirely dependent on the fishery for their living and earn 4 or five rupees per mensem occasionally for their work. They also act as vallam men for the conveyance of goods-traffic along the backwaters. In Velianad pakuthy and in those along the lake and river banks fishermen are found. They also have small compounds and do cooly work on the land.

Possible Industries.

Sugar.
Tapioca flour.
Arrowroot flour.
Bronze work.
Brush-making.
Plantain fibre.
Soap manufacture.
Coir mats.
Fruit preserving.
Biscuit manufacture.
Pottery.

These industries are all possibilities in the Taluk and could be worked up. They have been fully discussed already in the report.

Leather and tanning.—Changanacherry town is a great centre in this part of the country for the collection of hides and skins. These are sent to Alleppey and Cochin and even exported abroad to be made into leather. Some hundreds of such skins are sent out each month, and it would seem possible that something could be done to utilise these products locally. Besides this, we find horns and bones which could be utilised for button-making and comb manufacture. Hoofs and other offal which could be made into glue are all wasted. Attention therefore should be paid to the proper disposal of these articles, and since Changanacherry is already a centre for collection, the possibility of utilising these materials at this place should be seriously considered. The local price of the skins is small.

Fruit and fruit preservation.—As already mentioned under plantains large quantities of fruits are available in the town. If sugar is also cultivated and refined, then large quantities of jams, jellies, etc., could be made. This industry is already started in a very small way and is capable of being done on a large scale. Pine apples, mangoes, bananas, and many other fruits can be obtained in abundance, and, alongside a sugar refinery, this business would be profitable. The jars could be made by the local potters.

Medicinal herbs.—It is reported, that over a thousand candies of Nuxvomica are obtained here annually. Many other medicinal plants are growing in the taluk, and it would perhaps, be a profitable study to cultivate certain well-known varieties, and extract the drugs for a wider market. These could be made up in tabloid form with arrowroot flour, but it will have to be very carefully done under expert chemical supervision.

Pepper.—Pepper cultivation is possible in most parts of the taluk, and at present is carried on in a small way. Particularly do we find this suggestion put forward by the ryots of Madapally pakuthy. The manufacture of ground pepper could be carried on, and might well be attached to a fruit-preserving and pickle factory.

Sericulture.—The Department of Agriculture is already working in Tiruvella and District and there is no doubt that mulberry cultivation can be carried on as a cottage industry in Changanacherry also.

Poultry farming.—Large flocks of ducks and geese are reared annually on the backwaters and exported. Turkeys and chickens are also reared. There is no doubt that more could be done in this direction, and that proper scientific poultry-farming would be successful.

Basket-making.—This is not a big industry in the taluk, and yet raw materials exist in quantity. Coconut leaves, screwpine, etc., are found almost everywhere. If this is organised and properly taught, the industry could be just as successful here as in Mavelikara Taluk. Report of the latter taluk discussed the matter fully.

Boot and Shoe making.—A few shoe-makers are found in Changanacherry, but they have no special skill. If the tanning of leather were taken up, a shoe factory could be opened at the same time.

Weaving.—The present needs of the taluk are not fully catered for by local weavers. Already a weaving school has been started and it will be wise if the pupils trained therein are not allowed to settle in one place, but are scattered throughout the taluk in the villages for whose local needs they are specially required to cater.

Note on cottage Industries.—There is felt a want throughout the taluks of Central Travancore for the establishment of home industries for the middle class women. Already certain village organisations are taking up the idea and devising schemes for this purpose. Lace-making, sewing, embroidery, tailoring, knitting, have all been discussed, and it is difficult to select the most suitable occupation to suit each place. The manufacture of mosquito-netting is an industry which is in need of attention, and possibly this might be taken up by some of the weavers in the district. Knitting by machine and the manufacture of under-clothing, banians, etc., could be taken up and a central depot established for tuition and collection of the finished goods.

Foodstuffs available and used locally.—Rice, tapioca, yams, jack, mango, cocoanut, plantains, and all kinds of vegetables, etc.; fish is available and the taluk is rich in food-stuffs.

Economic Statistics.

In all occupations, excluding large land-owners and professional gentlemen, there are about 15,000 skilled workers including agricultural labourers, masons, carpenters, etc. A rough division can be made as follows:—

Name of craft.	No. of workmen.	Wages etc.
Carpenters.	500.	12 annas per day and on the average works 24 days each month. In many cases the women also earn.
Masons.	180.	8 to 10 As. a day.
Blacksmiths.	35.	Mostly contract work of 8 As. a day. skilled workmen receive up to Re. 1/-
Weavers.	75.	Rs. 12/ a month.
Bronze workers.	100 families.	Rs. 15/ a month when in full work.
Coolies.	Many thousands.	8 chs. and noon rice. He works for 20 days in each month.
General artisans.	(Goldsmiths, stone-cutters, potters, etc.,)	12 As. a day.

Cost of Living:—CULTIVATOR'S FAMILY—Re. 1/12 to Rs. 2/- per a family of 7 persons.

COOLY'S FAMILY.—10 chs. per day for a family of 4 persons, together with compound produce.

SINGLE PERSONS.—from 4 to 6 annas per day.

Number in Family.—CULTIVATOR, AND ARTISAN,—five to seven persons.

COOLY.—Four to five persons.

Number of voters.—148 persons qualified.

Number of professional people, (Vakils, etc.) About 400.

Co-operation.

There were no co-operative societies registered up to the end of 1922 and there is little co-operation or co-operative spirit in the taluk. This is particularly wanted in the case of cottage industries, bronze work, rice mills, etc., and industrial concerns in particular badly need the co-operative spirit.

Registered Joint Stock Companies.

Name of Company.	Registered capital.
The Changanacherry Commercial Co., Ltd.	Rs. 20,000/-
The Changanacherry Banking Co., Ltd.,	Rs. 60,000/-
The Sirdar Co., Ltd.,	Rs. 50,000/-
Vanchinad Rubber & Produce Co., Ltd.,	Rs. 375,000/-

Capital.—The total capital registered in this taluk is Rs. 1,30,000/- apart from a rubber company with 3½ lakhs of rupees. More money is available in the town of Changanacherry but what is really lacking is skilled leadership and expert management in which confidence can be inspired. Up to the present very little has been done to raise capital by co-operation, and it is essential that a model co-operative depot be established so that cottage industries may be properly taught, organised, and financed.

Remarks.—This taluk is one of the most promising, from industrial standpoint, and if capital is forthcoming its natural resources can easily be developed. The broadening and deepening of some of the canals so as to make the water communications better would do much to facilitate the transport of raw materials and open out the country industrially. Some of the roads are scarcely cartable and it is essential that local attention be paid to the repair and maintenance of these so that the expensive headloading of raw materials can be obviated. In conclusion, co-operation in every direction is badly needed.

ALANGAD TALUK.

Area, 127.34 Square Miles.	Population, 1,18,840
No. of Houses, 24,000.	No. of Voters, 103.
No. of Pakuthies, 10.	Taluk Town. Alwaye.

Location.

Division.—Situated in the North West and Central Northern portion of Kottayam Division.

Boundaries. NORTH.—Cochin State Territory.
 EAST.—Kunnatnad Taluk.
 SOUTH.—Cochin State Territory.
 WEST.—Parur Taluk and Cochin State.

Railway.—The Cochin State Railway runs through the Taluk. There are three stations in this Taluk, *viz.* Idapally, Alwaye and Angamali. The Railway is metre gauge to Shoranur from Eranakulam. Alwaye Station is 10 miles from Ernakulam and Idapally is 4 miles.

Backwaters and Rivers. The Periyar river runs through the Taluk and is navigable for vallams most of the year for many miles. This river runs to the Cochin Backwater. At Alwaye, the river divides and one branch goes to Verapoly and the other to Crankenoer Lake. Both these are navigable. The distance from Alwaye to Verapoly on the backwater is 12 miles by river. The Salakudy river touches one of the Northern Pakuthies *i. e.* Parakadavoo and is also navigable. The produce of this Taluk is thus conveyed to the nearest port, Cochin, with ease.

Main road and village road.—The Main Central Road runs through the centre of this Taluk from Muvattupuzha to Alwaye and thence to Parur. Another good road runs from Angamali to Alwaye. The village roads are in fair condition although there is room for improvement in many places. The bridge at Alwaye and the road to Parur would be a great advantage. There is no great difficulty in getting the produce away from this Taluk but in the interior head loading very frequent and cartable roads could be made on many of the tracts now existing, with advantage. The local people might be encouraged to do much of this themselves. The Alwaye-Idapally road is a fairly good one. In general, this Taluk is well served for purposes of communication internally.

Nearest seaport.—Cochin is only 10 miles by rail and 24 miles by backwater. The port is a good one and all the export is done from there. (Distances from Alwaye).

Cultivation.

Wet land area, 34,287 acres. Dry land, 34,700 acres.
Area under cocoanut cultivation, 979 acres.

Pakuthies.

Name of Pakuthies.	Area. sq. ms.	Popu- lation.	Wet land. Acres.	Dry land. Acres.	Coco- anut land. Acres.
Idapally Theken- bakom.	4.17	8000			
Idapally Vadakum- bakom.	2.23	15000			
Alangad.	8.12	11360	2767	2203	600
Kadungulloor.	7.21	7190	2340	1760	40
Aiurur.	13.35	10800	4940	2522	89
Chengamanad.	14.82	12890	5936	3027	—
Kothakulangara.	27.69	18200	6365	9189	125
Parakadavu.	9.56	7750	2769	2836	10
Alwaye.	19.04	11590	4059	6713	15
Thikkakkara.	21.05	11110	5112	6450	100

Education.**GOVERNMENT BOYS' VERNACULAR SCHOOLS.**

No. of H. G. Schools, 6. No. of Boys, 1431.
No. of Girls, 187.
No. of L. G. Schools, 17. No. of Boys, 1832.
No. of Girls, 593.

AIDED BOYS' VERNACULAR SCHOOLS.

No. of L. G. Schools, 14. No. of Boys, 1073.
No. of Girls, 351.

UNAIDED AND PARTIALLY RECOGNISED SCHOOLS.

No. of Schools, 14. No. of Boys, 723.
No. of Girls, 339.

GOVERNMENT GIRLS' VERNACULAR SCHOOLS.

No. of L. G. Schools, 6. No. of Girls, 609.

BOYS' ENGLISH SCHOOLS.

Alwaye H. G. 6 forms. 295 boys.
Idapally L. G. 3 forms. 119 boys.

There are no Girls' English Schools in the Taluk. The nearest school is Parur, St. Aloysius.

INDUSTRIAL SCHOOLS.

There are no Industrial Schools in the Taluk.

Natural Products and their Utilisation.

Paddy.—Used locally and exported to other Taluks by backwater. About $\frac{1}{3}$ of the Taluk is wet land and excluding Idapalli there is an area of over 34,000 acres of paddy land. No rice mill is working in the Taluk.

Cocoanut products.—Idapalli is the centre of cocoanut cultivation in this Taluk. Only 979 acres of cocoanut land are found in the whole of the other pakuthies. Alangad has 600 acres of cocoanut land. The water supply for soaking is everywhere sufficient and good. The coir extracted is exported to Cochin by backwater.

Tapioca.—The full capacity of the Taluk for Tapioca cultivation is not reached by a great amount. There are large tracts of hilly land in Alwaye pakuthy that would be excellent for Tapioca, but, at present, are merely waste growing shrubs which are used as manure for paddy land. If this area was brought under cultivation, it would make a tremendous difference in the quantity produced. The supply of good water, an essential for Tapioca cultivation and the manufacture of flour, the proximity of a port for export, and the good transport facilities, should make this one of the ideal sites for a Tapioca-flour-mill on a large scale. The local cultivation must be greatly increased however to meet this new demand. A survey of some of the pakuthies will be instructive.

Alwaye Pakuthy.—There is much Tapioca grown at present and facilities for still greater cultivation are found. Much of the waste hilly land could be brought under cultivation.

Aiyrur Pakuthy.—Tapioca is now cultivated on the hilly slopes of the Pakuthy and grows well. There are large tracts of fallow land which could also be utilised.

Alangad pakuthy.—Tapioca is cultivated in this pakuthy mainly in compounds. No large areas are found growing this root.

Chengamanad and Paraadava.—Tapioca is grown here for local consumption only. More could be produced. In conclusion, the Tapioca-flour-factory could well be placed at Alwaye, and obtain a good local supply, whilst the site is highly suitable.

Arrowroot.—This grows wild throughout the Taluk and is unutilised. If a tapioca factory is started, then, this could also be utilised for flour extraction.

Lemon Grass.—Cultivation and distillation of the oil are carried on in the Alwaye Pakuthy only. Much of the oil exported, which has a high Citrol content and is valuable therefore, comes to Alwaye from the neighbouring Taluks of Muvattupuzha and Todupuzha. There are about 20 stills now in existence in the Alwaye pakuthy, but many of these are not working. There are excellent prospects for the revival of this industry and the market for the oil is assured after the war. The sale is in the hands of merchants who finance the poorer ryots and collect the finished produce. Between 20,000 and 30,000 bottles are available in Alwaye as a general rule. The average price at present is Rs. 2 per bottle.

Sugar.—Along the banks of the Periyar river, throughout the Taluk Sugarcane is cultivated. The largest cultivation is found in the Ayirur and Alwaye pakuthies. There is ample opportunity for cultivation along the Chalakudi river also, but at present nothing is done, i. e. in the Parakadavu pakuthy. In Ayirur there are two bullock-driven crushing-mills with iron rollers in working order. The juice is boiled down locally in open vats, and molasses and jaggery prepared. The sugarcanes are bought here at Rs. 15 per 1000, and the molasses after crushing and boiling realises Rs. 22/8. About 500 bundles of Jaggery, each weighing 120 lbs. are exported to Cochin annually. The prewar price of Jaggery here was Rs. 1/4 per 16 lbs. but at present it has decreased to Rs. 1/2. This industry is one which could easily be developed on a larger scale and possibly a sugar-mill set up. The proximity to Cochin and the river and rail facilities seem to lend themselves to the industrial possibilities of this place.

Arecanut.—This grows largely throughout the Taluk, Ayirur pakuthy contains the largest number of trees. A study of the industry here will be interesting. The nut is first boiled, then cut into slices, and finally dried in the sun. It is

then packed ready for export. About 50 candies are exported to Palghat annually. This engages about 5 families each year for 3 months. Alwaye pakuthy also has a large number of trees and several families are engaged in preparation and export. Throughout the whole Taluk much of it is done and the industry is flourishing.

Plantains.—Large quantities of plantains are grown in the taluk. In Alwaye and Alangad pakuthies especially, the cultivation is done on an extensive scale. The fruit is exported to Shoranur, Cochin and Ernakulam. The fibre remains untouched, but arrangements are being made to open fibre extracting works. There is plenty of scope for this to be done as a cottage industry, and a good idea would be to instal some simple extracting machines in the villages. There is a good market for the fibre. The manufacture of plantain flour and the preservation of the fruit might easily be undertaken since sugar grows so near.

Kapok.—This is the best Taluk for Kapok cotton and the local merchants hold large stocks for export *via* Cochin. The increasing demands and uses are set out in the Mavelikara report.

Nut Meg.—This is grown in compounds throughout the taluk especially in Alwaye pakuthy and in Idapalli. It is exported largely to Cochin. Much more could be exported and the cultivation increased.

Peas, grams, Gingelly, Yams, Sweet potatoes.—These are grown for local consumption in small quantities.

Trees and Timber.—The trees found commonly in the Taluk can be set down as.

Jack, Mango, Marottie, Poovam, Travancore Payin, Karinjotta, Sappan wood, Kapok, Casheunut.

Other products.—Reeds and bamboos for basket working are found alongside the rivers. (Vide later note).

Minerals.

A very impure variety of Kaolin is found in Trikkakara Pakuthy. Besides this, the Taluk does not seem to have any minerals of importance discovered up to date.

Existing Industries.

Agriculture.—This may be styled the main Industry of the Taluk and more than $\frac{1}{2}$ the area is wet land. There are about 5000 large and small landowners with a minimum annual income of Rs. 300/-. 15,000 labourers, skilled

in agriculture, live in this Taluk. It is thus seen that the larger proportion of the people of the Taluk are connected with Agriculture. The daily income and expenditure of these labourers about balance and is approximately 8 chuckrams. Rental is paid as before, chiefly by land service. A small cultivator spends 20/- to 30/- Rupees per mensem for living, and in many cases he gets into debt or ekes out with compound produce. The great difficulty experienced for improvement of agricultural methods is largely due to the lack of ready cash to buy manure etc. If some means could be found for freeing the capital locked up in landed property, both Industry and Agriculture could be developed. The small ryot, however, should be taught more business like administration of his estate, accurate bookkeeping etc. The middleman absorbs large profits on produce in many cases, because of the lack of knowledge of the ryot in business matters. Most of the implements used here are imported from Cochin, whilst there are about 130 local blacksmiths. The same complaint is levelled against these men by the ryots as elsewhere, namely, unreliability as to time, price and quality. This can only be altered by steady and proper tuition.

Coir and Copra.—The important centres for coir manufacture are Idapalli, Ayirur and Alangad. There are about 2000 families in Idapalli engaged in this Industry and there is good water facility for the work, so that, in normal times, it is quite flourishing. Good water-communication exists with Cochin, and transport is cheap. In Ayirur pakuthy there are about 300 families engaged in the industry, and about 1000 families in Alangad. The above remarks apply also to these pakuthies. Most of the Copra produced is sent to Cochin for export. Nevertheless for local needs oil is extracted by country presses. There are about 100 presses in the Taluk. The oil produced locally is sold in the Idapally market, and in Alwaye.

In prewar times coir yarn from this district realised a price of Rs. 90/- per candy, but, this has now dropped very considerably and Rs. 15/- to Rs. 20/- only is obtained for the same amount. The industry is flourishing here, in normal times.

Weaving.—The weavers are scattered throughout the Taluk, and supply local needs only. They weave local cloths and towels and the lower counts of thread only are

used. The thread is obtained individually by the weavers from Cochin. A study of the pakuthies will give the best idea of the Industry.

Idappalli.—There are 20 families of weavers scattered throughout the pakuthy. They consume about 400 lbs. of yarn per month. Actual work is only carried out for 15 days each month and the rest of the time is taken up in sizing etc. Each weaver earns about Rs. 10/- per month, and his expenses almost balance. They work chiefly on a system of advances. They obtain order and an advance of payment. The yarn is then purchased and the cloth woven. If no advance is given, no work is done. This system is bad for the workers and the work also. They cannot hope to compete with outside agencies. There is great need of a co-operative depot in the Taluk to finance and control this and other cottage industries.

Changamanad.—There is a small community consisting of 50 weavers in this place, and the conditions are almost the same. The market for the goods is in Alwaye. About 50 bundles of yarn are consumed per month. No superior cloth is made. The price is not regulated, and is inflated or even sold at a loss according to the financial position of the weaver and the demand.

Mat-Weaving.—Bamboo-mat-making is one of the great cottage industries of the Taluk and thousands of mats are made annually. The bamboos and Aeta are floated down the Periyar river to Alwaye and other places. They are sold at the rate of Rs. 1/1² per 100 at Alwaye. These are bought by the poor people at a higher rate even fetching 1 chuckram per cane. There is also a reed depot at Angamali. This depot supplies the raw material for the Parakadavu and Kothakulangara pakuthies. The reeds and bamboos are taken to the houses of the poor people and split into the necessary thicknesses and widths with chisels and knives made locally. The Kothakulangara pakuthy is especially noted for this work. The following pakuthy statistics can be quoted.

Kothakulangara.—There are thousands of people working, both men and women, in this pakuthy. About 20,000 mats can be made and are usually available every week in the Angamali market. The average price for a mat 4' x 6' is 4 annas and smaller mats are made at corresponding rates. The ordinary weaver can earn as much as Rs. 8/- or Rs. 9/- per month from these. No capital is invested by the maker,

but the larger merchants buy up the produce and give them advances. In many cases it is used as a subsidiary Industry to Agriculture, and in others is done by the women of the family. The workers are usually drawn from the poorest classes.

Parakadavu.—There are about 100 workers in this Industry, in this pakuthy. Bamboo is obtained from Angamali. The work is an additional source of income to the people and they earn from Rs. 5/- to Rs. 6/- monthly. The bamboo is brought from the Angamali depot by headload once per week and the mats sold at the market the following week. There is no cartable road from Angamali to the remote parts of the Pakuthy.

Alwaye.—About 30 families are engaged in the Industry here. The wages are as above. The larger merchants live here and the big dealers. The export is entirely done from Alwaye by the merchants. In many cases these men finance the workers, and are suppliers of Bamboo and of food-stuffs, so that they are paid in kind and not money such as rice and Banboos to continue their work.

This is a most important Industry, and, for war purposes in 1918, over 2 million square feet of matting have been made and despatched.

Basket-Making.—This is an industry that is badly in need of development and is situated chiefly in Alwaye pakuthy. The Pulayas have a hereditary industry and about 20 families are engaged in basket-making. The baskets are made of reed, cane, Bamboo and Aeta. The weavers live in the direst poverty and their huts are mere cadgan roofs on four posts and generally filthy dirty. They buy a few bamboos for a few chuckrams and then they go home to weave them into baskets. The men split the bamboo and the women do the weaving. The finishing is done by the men. After $1\frac{1}{2}$ days work one basket is made and for this 6 to 8 annas is received. The method of sale is haphazard. If, local people care to buy, then, it is sold. If not, they wait at the Railway station to sell. If unsold, they must starve or sell it to the food merchant for a price below the actual value and this is often done. Thus, they are always in the same state of penury. Recently an attempt has been made to export the baskets. They are of the handbag pattern. This has met with success and exports to other places in India have been done with our help. New patterns have been taught and for 6 Annas a three tier

tiffin basket can be made. The total earnings of a worker in constant work are Rs. 7/ per month. This could be enhanced, and the people kept in constant employment, if the industry was organised properly. Here, again, is the necessity for a co-operative depot for cottage industries highly evident. At the present time, these baskets are cheaper and superior to the Japanese article of the same type on the market and they need a wider field and advertisement. A depot for instruction in new patterns and for collection of goods etc. on the general lines indicated in our report would be a great boon. Good cane-baskets realise Rs. 2/- to Rs. 3/- whilst others vary in price up to Re 1/- if made from Bamboo. 6 to 8 Annas is the average price.

Bronze-workers.—At Idapalli there are 25 families of bronze-workers. The average worker uses 40 lbs. of bronze per month and turns out goods to this weight. He earns as profit Rs. 15/- per mensem. The system of working is one of advances, and the worker often cannot start unless an advance payment is made. Lack of business-method and unpunctuality have destroyed the confidence of the public in making such advances, and as a consequence these workers are often idle. There is a good market for their goods, but they are unable to secure it owing to bad methods of business and lack of capital. The estimation of the price of an article and the true value of their labour are unknown to them, and they need a proper means of instruction and control in order that their craft may not die out. Again a depot, as indicated above, might be of valuable help. In Parakadavu pakuthy there are about 15 more families of bronze workers and there plight is similar to that mentioned above.

Pottery.—Potters are scattered throughout the Taluk in all the Pakuthies and supply local needs. There are at least 170 persons engaged in the work. The articles made are local pots and culinary utensils, and are sold in the markets. The prices realised vary with the size of the article from $\frac{1}{2}$ to 7 chuckrams. A potter can earn 5/- to 6/- rupees in a month, if he is in constant work. Many are discontinuing owing to its arduous nature and the desire for education and social elevation. The balance of the cost of living is met by compound produce, as a rule. Good clay exists in Trikakkara for tilemaking, and the industry of tiles and pottery could be developed. Capital is lacking, however. Parakadavu pakuthy also has good clay available. Firewood and fuel is easily obtained as it is floated down the river.

Minor Industries.—Tailors, Carpenters, Masons, Goldsmiths, Blacksmiths etc., are found throughout the Taluk and are supplying local needs. (See Later).

Possible Industries.

Paper Manufacture.—The suitability of Alwaye as the site of a paper factory has been investigated. The forests of the Northern Range, and particularly those through which the Periyar river runs, are rich in Bamboo, Aeta, and reeds suitable for pulp manufacture. Some idea of the quantity to be obtained is difficult to ascertain; but, from forestry reports, it appears that, at present, 500 tons of Bamboo and 2000 tons of reeds per annum are removed annually from this district. The bamboos can be floated down the river together with the fuel necessary. The rail facilities and the shipping facilities from Cochin are also helpful factors in the establishment of a factory here. Water transport to Cochin is good and the Rail to Madras is at hand. A report on the paper industry kindly supplied by the Conservator of Forests from his files shows that two sites were suggested for a pulp factory, one at Koothikal and the other at Adirappally on the Chalakudi river. Mr. Raitt, the Dehra Dun paper pulp expert is of the opinion that Alwaye is most suitable and that the requisite quantity of raw material is available for a continuous supply. "To quote from a report by Mr. N. Velu Pillai D. F. O. here. "Raw materials fall under three classes and can be made easily available.

(1) Reeds. (2) Bamboos. and (3) Woods.

(1) *Reeds.*

The following species occur, (1) *Ochlandra Travancorica*. (2) *Beesha Rheedi*. (3) *Beesha. Travancorica*. (4) *Oxytenanthera Thwaites*.

These grow over extensive areas and assure a never-failing supply. More than 5 lakhs of reeds are now removed annually under the permit system and more lakhs can be removed if wanted. They cannot be exhausted by overworking. The cost of removal is nominal and labour for removal is available. A perennial supply of much more than 2,000 tons can be guaranteed. The removal of reeds is advantageous in other directions also. "Bamboos occupy a smaller area than reeds.

(2) *Bamboos.*

The following bamboos are found.

(1) *Bambusa arundinacea*. (2) *Dendrocalamus Strictus*.

At present about 500 tons per annum are available and used chiefly for floating logs.

(3) Woods.

The D. F. O. reports that at least 33 species of soft woods are available and that it is possible that these can be used for pulp manufacture. Over 1000 tons per annum could be guaranteed at least.

From the foregoing and from personal investigation, and taking into consideration that chemicals and machinery have to be set up and obtained, there seems little doubt that Alwaye is a most suitable site. Probably soft wood pulp will be of the greatest value as the quantity is greater and the perennial supply guaranteed.

Pottery and tiles.—This has already been referred to in the report; but an up to date pottery could be established and worked profitably in the Taluk. Capital is needed. The best sites are Triakkara, 4 miles from Alwaye, and also Parakadavu.

Sugar.—The sugar-cane cultivation could be greatly extended and more molasses produced. It would be possible to have a sugar refinery in the district, although perhaps it would be better to have it at Muvattupuzha or Thodupuzha in the centre of the sugar area. At any rate attention should be paid here to this industry. N. Travancore can certainly support a sugar refinery, if properly managed and financed.

Tapioca flour.—As already reported, a factory at Alwaye for the extraction of Tapioca flour would pay. The area must be increased which is under cultivation, and with the good water supply and transport and export facilities this would be highly suitable for a factory. Bulletin No. 8 of this Department deals fully with the Technical part of the work.

Coir Industry.—This can also be developed in the Idapalli pakuthies, but, at present, the industry is thriving in this taluk in normal times.

Plantain.—Plantain fibre, Plantain preserving as Jam, Plantain flour. This is a most important industry to be developed here. A fruit grows plentifully, and the fibre could be extracted as a cottage industry. A ready market

for export could be found in Cochin. The preservation needs a large-scale factory. The ready sale of plantain preserves and other jams from Japan is sufficient guarantee of its success. The flour is badly needed as an invalid and infant food and a pure article would produce a ready demand. The cultivation would have to be done on a large scale to meet the demand, but this would not produce any difficulty in this Taluk. The capital needed to start is not large, but purity and cleanliness of the finished products would have to be guaranteed.

Hides and skins.—Large numbers of Hides and skins are exported from Alwaye annually, and it is likely that a tannery, here, would be successful. Water is plentiful and the adjacent forests could produce tanning barks. About 300 hides, per month, of Buffalo, oxen and sheep are exported now to places North of Angamali by rail etc. Over 100 candies of Konnai bark per month are also exported from the local forests through Angamali. Chenica to the extent of 100 candies per month is also exported. The export of both Raw hides and the tanning materials is significant, and it is obvious that a tannery here would have great advantages in raw materials on the spot. Cochin is near for export and rail facilities are excellent. This industry could be started here with comparative ease.

Button making.—Along with the hides, a large amount of bone material is available. This could be utilised as also horns for button and comb-making. About 4,000 rupees would establish a good button-factory here. The ivory nut is also available in large quantities for button-making, and, alongside the tannery, this would pay well. Large capital is not needed.

Forest produce.—Nux Vomica is exported to the extent of 200 candies per mensem. The Northern forests abound in raw materials, and these should be carefully investigated one by one.

Cottage Industries.

Basket-making.—This has already been discussed in this report. It is badly in need of proper instruction, guidance and organisation. A co-operative depot, as indicated in our general report could do this work most efficiently.

Toys.—Skilful handworkers exist in abundance. They could well be taught toy-making. Wood, and raw materials are cheap.

Bamboo furniture.—Bamboo furniture of all types could be made here as a cottage industry. The raw materials are plentiful and cheap. The tools used can be locally made. The market for such cheap and ornamental work is assured. The work is easily taught, and a function of the Industrial Depot here should be to introduce this industry. In Japan and China it is thriving, and large exports are made. Tables, stands, chairs etc., can all be made without expensive materials. Proper jointing, cutting, matting etc., should be known in order to compete on the outside market. This should certainly be a cottage industry introduced here.

Foodstuffs used and available locally.—Rice, Tapioca, yams, plantains, mango, peas, Ragi, Chamai, Grams and vegetables. Fish is available from the rivers and backwaters.

Economic Statistics.

In all occupations, excluding large landowners and professional gentlemen there are about 20,000 skilled workers in the Taluk. They can be roughly divided as follows, excepting agricultural workers, (15,000).

Name of craft.	No. of workmen.	Wages.
Carpenters ...	800	8 to 10 As. per diem.
Masons ...	750	8 to 10 As. per diem.
Blacksmiths ...	120	12 to 16 As. per diem.
Goldsmiths ...	70	Contract work only. About Rs. 12 to Rs. 15 per month.
Sawyers ...	75	Not caste men but Tiyyas. About 12 As. per day but do piece work and paid accordingly.
Weavers ...	100	Rs. 10 per month.
Potters ...	170	Rs. 5 to Rs. 6 per month.
Coir-makers ...	About 300	Rs. 5 per mensem.
Mat-weavers ...	Some thousands	Rs. 5 per mensem if full work. Amount varies with diligence of worker. Average Rs. 3.
Tailors ...	About 50	12 As. per diem. Generally contract work undertaken.
Bronze-workers ...	40	Rs. 12 to Rs. 15 per mensem.
Basket-makers ...	20 families	As. 4 to As. 6 per day.
Coolies ...	Some thousands	As. 4 to As. 5 per day.

COST OF LIVING.—(NORMAL TIMES).

Cultivator's family.—Rs. 20 to Rs. 25 per mensem.

Cooly's family.—Rs. 6 to Rs. 7 per mensem. Compound produce is also used for maintenance. Average wages barely meet expenditure when normal.

Single person.—Rs. 6 to Rs. 7 per month for middle class and cultivator.

NUMBER IN FAMILY.

Cultivator.—6 persons is the average.

Cooly.—4 to 6 persons.

Number of people qualified as voters.—103 i. e. paying over 50 rupees land tax.

Number of Professional people.—500 (Officials, Vakils, Schoolmasters etc.)

Co-operation.

There are no co-operative societies in existence in the Taluk on 1st Chingom 1093. A co-operative depot is badly needed to assist cottage industries and should be established.

Capital.

In practically all the pakuthies there are wealthy landlords, and in Alwaye there are many wealthy merchants. These men can well finance all the Industries if necessary and if they are willing. Lack of enterprise and the assured security of landed property all make them apathetic to Industrial enterprise. The Taluk is not poor for larger capital and it should be able to finance the concerns fully. The people need demonstration and leading in proper directions in Industrial matters. For cottage Industries a co-operative depot is necessary, but the capital would be difficult to realise as the workers are extremely poor.

Remarks.

It can be said of this Taluk that no place in Travancore has better prospects for Industrial development. Its transport facilities are excellent, and its raw materials in plenty. Capital is fairly plentiful and if the people would rise to the occasion Alagad could be made one of the richest and most Industrially prosperous in the State.

PARUR TALUK.

Area.—53·87 Square miles. Population.—76,360. No. of houses.—14560.

No. of voters.—123. No. of pakuthies.—7. Taluk Town.—Parur.

Location.

Division and Boundaries.—North, South and West is Cochin State territory and on the East is Alangad Taluk. One pakuthy is isolated in Cochin State namely Puttanchira. The Cochin Backwater and the continuation of the Cranganore lake form the boundary line on the West of the Taluk. This Taluk forms the North West portion of the Kottayam Division.

Railway.—No railway runs through the Taluk. The nearest station to Parur town is Alwaye, $9\frac{1}{2}$ miles distant. This is reached by road. The road is a good one, but a ferry has to be crossed at Alwaye over the Periyar rivers. Ernakulam is much used for traffic and a regular steamboat service is run from Cochin daily. The distance is entirely by water and measures about 16 miles. The journey takes from $2\frac{1}{2}$ to 3 hours from Parur to Ernakulam.

Backwaters and rivers.—(1) A branch of the Cochin Backwater runs along the Western boundary of the Taluk to Cranganore lake and is navigable all the way and all the year round. This is the main waterway of the Taluk.

(2) A small canal runs from Varapuzha to Parur through the Kottuvalli pakuthy. It is not navigable during the dry season. The canal is being deepened to admit of traffic all the year round.

(3) A canal runs through Ezhikara to Parur and joins the branch of the Periyar river near Chakkarakadavu. This is scarcely navigable during the hot season.

(4) A branch of the Periyar runs between Chenamangalam and Parur and joins the backwater at Chakkarakadavu.

(5) A small canal runs from Parur to Chenamangalam town.

It will be seen from the above that the Taluk is well served with waterways and canals, and with a little local effort the canals can be deepened and the transport greatly facilitated.

Main roads and village roads.—The main road from Alwaye to Parur is good, but inconvenience is caused by the

ferry at Alwaye and a bridge would be a great advantage. Another road runs from Parur to Idapalli and is in fair condition for traffic of all kinds. A sandy road runs from Varapuzha to Parur. The village roads are not usually cartable and generally sandy. Most of the produce of the Taluk is conveyed by headload to the Canals and Backwater. The roads are not so necessary, here, as the canal and water traffic are so good. Local effort could do much to render the facilities for the despatch of produce much greater.

Nearest Seaport.—Cochin is the nearest seaport, and can be reached by Backwater from practically all parts of the Taluk. The distance from Parur town to Cochin is less than 16 miles and a regular vallam and steamboat service runs daily.

Cultivation.

Wet land Area.—12229 acres. Dry land—16135 acres. Area under cocoanut Cultivation—6000 acres.

Pakuthies.

Name of Pakuthy.	Area.	Popula- tion.	Wet Land.	Dry Land.	Cocoanut Land.
Varapuzha ...	8.02 sq. miles	7830 Persons.	1886	2707	6000 acres.
Ezhikkara ...	2.54 sq. miles		592	467	
Kottuvalli ...	8.86 sq. miles		1945	2948	
Parur ...	7.54 sq. miles		1425	2501	
Puthenvelikara ...	9.81 sq. miles		3320	1789	
Vadakekara ...	8.46 sq. miles		764	3099	
Puthenchira ...	8.66 sq. miles		2297	2624	

Education.

GOVERNMENT BOYS' VERNACULAR SCHOOLS.

No. of H. G. Schools	3.	No. of Boys	1071.
		No. of Girls	111.
No. of L. G. Schools	11.	No. of Boys	1443.
		No. of Girls	264.

AIDED.

No. of H. G. Schools	1.	No. of Boys	202.
		No. of Girls	76.
No. of L. G. Schools	8.	No. of Boys	916.
		No. of Girls	231.

UNAIDED BOYS' VERNACULAR SCHOOLS.

Total No. of Schools. 3. Total No. of Boys. 150.

Total No. of Girls. 69.

GIRLS' VERNACULAR SCHOOLS.

No. of H. G. Schools 3. No. of Girls. 819.

No. of L. G. Schools 6. No. of Girls. 463.

BOYS' ENGLISH SCHOOLS.

Parur Government H. G. 6 Forms 697 Boys 20 Girls.
English School

Kunanmavu (aided) H. G. 1 Form 28 Boys

GIRLS' ENGLISH SCHOOLS.

Parur St. Aloysius L. G. 2 Forms ... 45 Girls.
(aided)

INDUSTRIAL SCHOOLS.

There are no Industrial Schools in the Taluk. } A school here should instruct in Basket-making, and coir-work (brush making etc., Pottery might also be introduced).

Natural Products and their present utilisation.

Paddy and Rice.—Used locally. About $\frac{1}{2}$ or more of the Taluk is paddy land. This is not sufficient for the needs of the Taluk. No rice mill has been opened. The road from Alwaye to Parur runs through paddy lands practically all the way. The crop is obtained once per annum and the Eastern portion of the Taluk is mostly paddy land.

Cocoanut and coir.—This is the main crop of the Taluk and the most important industry of the people. Over 5 lakhs and possibly 6 lakhs of trees are growing in the Taluk, and over $\frac{2}{3}$ of the area of the Taluk produces the cocoanut tree. There is no lack of water in the Western parts of the Taluk where the Cocoanuts are found chiefly, and, in normal times the Industry is flourishing. The coir is exported to Cochin after beating, and this is really the staple industry of the Taluk. The copra is also sent to Cochin where it is crushed and the oil expressed in the mills found there. There are about 250 bullock-driven oil-mills also in the Taluk, and these supply local needs, and also oil is sent weekly to Alwaye, where it is also in demand. There

is no power-mill in the Taluk. The industry can be studied under the various pakuthies.

VADAKAKARA.—A rough estimate of the prices at present time is as follows :—

1000 cocoanuts cost Rs. 28 and $\frac{1}{2}$ candy of copra is generally obtained from this, and the price realised is again Rs. 28. The profit lies chiefly in the shells and fibre obtained which will realise 5 or 6 rupees. Husks cost $\frac{3}{8}$ to 4 rupees per 1000 and about 180 lbs. of coir are obtained from these. The price of the coir is Rupees 9. A fairly substantial profit is thus gained. Before the war about 400 candies per month, of coir at Rs. 85 per candy were exported monthly to Cochin and about 500 candies of copra were also sent at Rs. 110 per candy. The industry was thus flourishing in this Pakuthy.

EZHIKARA.—In prewar times, about 15 candies of copra and 25 candies of Coir were exported from this pakuthy per month. The price is fluctuating and very variable.

VARAPUZHA.—200 candies of copra per month are exported from this pakuthy. The coir industry has declined during the war for lack of demand, but 150 candies of yarn per month are even now exported. The future of the industry here is bright if the resources are fully developed.

PARUR.—Large quantities of copra and coir are produced here, and over 500 candies of each are exported in normal times.

PUTHENVELIKARA.—In this pakuthy, the majority of the nuts are sent out straight from the trees to Cochin where they are worked for fibre etc. This is largely to avoid the payment of Excise duty on the finished product. Above this about 30 candies of coir and 20 candies of copra are exported to Cochin every month.

The industry is in a good condition in normal times, but it could be developed still more if the people would do their utmost. A great deal of the produce is headloaded and road improvement would do much to assist further progress. The laborious beating of the coir and the long soaking make it expedient that research work be done to see if this can be avoided. Fibre-extracting-machines might be introduced and brush-making started as a cottage industry. Soap-making, using the oil, could also be attempted here.

Tapioca.—This is grown only in compounds for local consumption. No extensive cultivation exists. In Puthenvelikara pakuṭhy there are a few hills where Tapioca could easily be grown and red soil is found. This area could be made to contribute to a Tapioca-flour-mill at Alwaye if such was started as indicated in our report of Alangad Taluk.

Arecanut.—Nearly two lakhs of trees are found in the Taluk. This is mainly used for local consumption though possibly some are dried and exported. Nothing else is done with the produce.

Jack, Plantains, Yams, etc.—These are minor products and used for local consumption only.

Trees and Timber.—Jack, Travancore pine, Tamarind, Pinnay, Arecanut, Cocanut, Marottie. Pinnay oil is made locally. The resin from Pine is not utilised.

Other products.—Fish is obtained in large quantities from the Western portion of the Taluk and fish oil might be extracted. This could be utilised with pinnay oil and cocoanut oil for soap-making.

Minerals.—Excellent clay exists for pottery at Anachal two miles from Parur on the main road. At present all the local pottery is made from this clay. The potters are found in the vicinity, but also the clay is carried by others to a considerable distance away for working. Capital for such an enterprise would be found easily, in Parur, amongst the richer people, and already some have begun to think about such a project. There is no doubt about the demand locally, and also the quality of the clay and the quantity available. This is an industry that is calling for development.

Kaolin of inferior quality is found near Varapuzha. No other minerals of importance have been observed up to date.

Existing Industries.

Agriculture.—Between 60 and 70 landlords with an income over Rs. 3000 per annum can be found in the Taluk, about 500 agriculturists with an income of Rs. 400 and over, and about 5000 to 6000 Agricultural labourers who are skilled workmen. The Agricultural labourer's monthly income varies from 5 to 10 rupees according to skill and the number of days he works. The labourer usually acts as watcher for his landlords cocoanut trees, and is allowed the

produce of one or two trees and a rent-free house in return. The small landlord has a monthly expenditure of from 20 to 30 rupees per month, and the labourer usually has to spend Rs. 6. This is in normal times, and, even then, it leaves little or no margin for saving or for development of the land. The larger landlords act also as money-lenders and the smaller men borrow frequently. Failure to repay results in legal action and loss of land or money. The development of the land is held up, in many places, for want of ready cash to buy implements and manure. Implements are mainly brought from big firms in Cochin. The labourer works about $\frac{3}{4}$ of the month. Local blacksmiths for repair of agricultural tools are very few and unreliable. Most of the people of the Taluk can be classified as engaged in Agriculture, in some way or other.

Cocoanut Industries.—Some thousands of coir-makers are found in the Taluk, and this can be said to be the staple Industry of the Western portion. The Industry has been dealt with at length earlier in the report.

Weaving.—There are very few weavers in this Taluk and they total only about 30 at the most. These are found almost entirely in Parur. About 18 families are connected with the Industry. The yarn is exported from Cochin by a local merchant and the finished cloth is usually brought back by him. The weavers now consume about 500 lbs. of yarn per month, but in prewar times the demand was four times as great. If the weaver is in constant work he earns only from 8 to 10 rupees per month, and his cost of living about balances. He is frequently in debt to the merchant, and hence is often unable to get a good price for his goods or his labour. The present tendency is for the weaver to forsake his calling after being educated, and the industry is declining fast in the Taluk. The local weavers make only the rough cloths. The dependence on big merchants for loans and advances, lack of business-method, lack of assured market, no regular prices either for goods or for labour, are the causes of the decline, and only tuition and expert guidance and co-operation can help. Education gives them a social uplift and this elevation now places them above manual labour and their old calling. This should be altered by Industrial Schools and depots. At Vadakakara there are about 12 families of weavers now in employment, and their condition is similar to those already mentioned.

Bricks and tiles.—Bricks and tiles are made at Varapuzha at present and about 40 families of brickmakers are at work. The clay is not found locally but is imported from Muttar in Vallams at the rate of Rs. $\frac{1}{4}$ for each load. About 150 Vallam loads per month are thus utilised. Firewood is obtained locally and Rs. 2 worth of fuel will bake 1000 bricks. One load of clay will produce 1000 bricks and Rs. $\frac{4}{12}$ is the profit realised on 1000 bricks which are sold for Rs. 8. These bricks have realised a price as high as Rs. 12 per 1000. A family of brickmakers can earn as much as Rs. 25 per mensem by this industry.

Potters are found in 3 pakuthies, namely, Kottuvalli, Puthenvalikara, and Varapuzha. 20 families are working in the former pakuthy, 2 families in Puthenvalikara and 6 families in Varapuzha. The clay for their work is obtained chiefly from Anachal. A monthly income of Rs. 5 to Rs. 6 is obtained by the potters. Clay exists in plenty, but the workers are comparatively few. Women of the household also assist in the work and carry the clay and firewood. The prices realised vary with the pots, and Rs. 2 to Rs. 5 per 100 is the usual rate. The houses of the potters are poor and flimsy and they live a hand-to-mouth existence. The pots are sold in the market at Parur, and they meet the local requirements. The demand for tiles, pots and bricks is great locally, and the establishment of an up to date concern is an urgent necessity. The potters are skilled and ready to work but capital is needed. This could be raised locally and there are indications that this will be done.

Carpentry.—About 50 families of carpenters are found in Varapuzha. They make wooden boxes for local use. These are also exported to Cochin and other places and are in great demand among the ordinary people. Especially on festival occasions, these boxes have a large sale. About 30 sawyers are engaged in the pakuthy to saw thin planks for the carpenters to work upon and the timber is supplied by the Forest Department. These people derive a steady income from this work.

Toys and Toy making.—Small toys and idols are made by 3 families in Varapuzha. There are great facilities for the development of this industry in Travancore and Bulletin No. 12 has dealt fully with these. Here we have skilled workers ready and trained, and the future of the work and its extension can best be accomplished on the lines indicated in the Bulletin.

Fishery.—Fishing is a thriving industry in the Western portion of the Taluk, and river and backwaters are finished regularly. Many fishermen are found, and an exact study of the pakuthies in detail will best give a good idea of the extent and importance of the calling.

Fishery.—VARAPUZHA.—About 50 families of fishermen are found in this Pakuthy. The fish caught is largely exported to Cochin. Prawns are dried in the Sun and exported. The average monthly earning of each family is Rs. 10 to Rs. 12.

PUTHENVELIKARA.—The total export of fish from this pakuthy is 3000 lbs. There are at least 80 families engaged in the industry here and the monthly income averages Rs. 10.

PARUR.—300 families or more are found in this pakuthy who are engaged in the Fishing industry. Rs. 10 is the average wage. Fish oil is also prepared here in a crude manner and consumed locally, chiefly by the producers. The fish is largely exported and the prawns obtained are dried and exported to Cochin and other places.

VADAKKEKARA.—100 families of fishermen live here and follow their calling. Rs. 10 seems to be the average monthly income. Twelve families are engaged in fishcuring. Large quantities of dried prawns, salted and cured fish are exported to Cochin and other places.

EZHIKARA.—In this pakuthy there are about 50 families of fishermen. The bulk of the fish is exported to Cochin. Dried prawns are largely exported to Cochin and thence to Burma, Prawn fishery is carried on during 3 or 4 months of the year during the hot season.

KOTTUVALI.—30 families of fishermen work in this pakuthy at their calling. There are also 30 families engaged in fish-curing, and the product of their labours is exported to Alwaye and Cochin. Rs. 10 is a fair estimate of the average monthly income.

The above statistics indicate the importance of the industry to this Taluk. Fish-oil extraction, Fish canning and tinning, Fish curing could all become good and thriving industries here.

Possible Industries.

Cocoanut Industries.—A coir-extracting-factory could well be started and also a brushmaking factory. An oil-mill for cocoanut-oil would find raw material in plenty, and

pinnay-oil and fish-oil are obtainable locally. A soap-factory could be started here with the abundance of oil available. Dessicated cocoanut could also be made here and the proximity to the port of Cochin would render export easy. The establishment of a Margarine factory should also be considered, but possibly a better site could be found in the neighbouring Taluks. It is an industry that would succeed here. The last two factories could only be started with large capital. These points should be well considered.

Bricks and Tiles.—There is no doubt that a factory for the manufacture of bricks and tiles would pay if established near the clay deposit at Anachal. Local enterprise could well be directed in this direction, and the demand in the vicinity is great. The question has been discussed at length earlier in this report.

Fishery.—Scientific fish-curing, and the tinning and canning of sardines, prawns and other fish could be undertaken. Fish-oil could be extracted and soap-making done. There are great possibilities in this industry for the people of the Taluk and capital or co-operation is badly needed.

Cottage Industries.

Toys and toy making.—As already mentioned there is scope for the development of the manufacture of toys etc. Already a few families are engaged in this pursuit and more could be done. A depot for teaching and collection of the goods, finding markets etc., could organise this well.

Coir-Matting.—This could be taken up here as a cottage industry and with the abundance of cheap raw materials would succeed. A depot on a co-operative plan could well organise this.

Weaving.—Local weavers need encouragement and help. They also require instruction as to the newest and best patterns. A doot as indicated before would assist greatly. The industry has been discussed at length already in this report.

Foodstuffs used and available locally.—Rice Tapioca, Yams, Jack, Mango, Plantains, Banana, and vegetables. Fish is largely consumed also.

Economic Statistics.

The total number of skilled workmen of all kinds, including Agricultural workers is about 12,000. Masons,

Carpenters etc. are included. They can be roughly divided as below:

Name of craft.	Number of workmen.	Wages etc.
Carpenters.	185.	8 to 10 Annas per day.
Masons.	325.	9 to 12 Annas according to skill.
Sawyers.	50.	Rupee 1 per day when working full time, but work is mostly by contracts and irregular.
Weavers.	30 families.	Families mostly work together and the income is from 8 to 10 Rupees per month.
Potters.	about 70 families.	This includes brick-makers. The average income is Rs. 5 per month, for a potter and up to Rs. 25 for a brick-maker.
Coir-makers.	Some thousands.	Amounts varying according to work done, roughly 4 to 5 rupees per month.
Blacksmiths.	About 60.	Contract work. Average 12 Annas per day.
Goldsmiths.	35.	Contract work. Average Rs. 16 per month when working fully.
Oil- Pressers.	250. about.	Incomes vary up to Rs. 10 per month according to work done.
Copra-makers.	200. about.	Rs. 5 or 6 per month.
Fishermen.	About 700 families.	Rs. 10 per month in the good season.
Fish-curers.	Many families.	Rs. 10 per month.
Toy-makers.	3 families.	Rs. 15 per month if in full work. Can earn even more is skilled.

COST OF LIVING.—*Cultivator's family*.....20 to 30 Rupees per mensem.

Cooly's family.....Rs. 6 per mensem on the average. This is met barely by the income. The compound produce assists him to live. His daily pay is 6 to 7 chuckrams. There are many thousands of such people.

Single person.—(Middle class) Rs. 7 at least.

NUMBER IN FAMILY.—*Cultivator*..... 6 to 7 persons on the average.

Cooly.....4 to 5 persons on the average.

Number of people qualified as voters i. e., paying Rs 50 land tax.....

Number of Professional people.—Vakils, Schoolmasters etc.).....About 400.

Existing Co-operative Societies.

Name of Society	Working Capital.	Profit in 1992.	Number of members.
Parur Co-operative Credit Society (General.)	Rs. 2,136.	Loss was Rs½.	60.

Capital.

The wealth of the Taluk lies chiefly in Cocoanut produce and paddy. The money is locked up in stock or in land, and very little cash is available for investment. In Parur, there are several Hundi merchants who advance money to the cultivator and many of the landlords are indebted to them. If Rs. 15,000 were raised it would be only with effort. Co-operative effort is not very flourishing here, but is badly needed. This need is felt both in Agriculture and Cottage industries. At present the co-operative capital is only Rs. 2,136 for the whole Taluk.

Remarks.

This Taluk is one with good industrial prospects. Coir and Cocoanut Industries, Paddy and fishery are already in a flourishing condition, but they need improvement in methods and fuller utilisation of the products derived. Several ways in which this can be done have been indicated above. Research work is necessary, and a depot for Cottage industries and instruction in the these of raw materials to better advantage

would prove useful. Tile works could be started and would be of local use. This could be done with little effort on the part of the people themselves. Soap-making etc., are also possibilities as already mentioned.

KOTTAYAM TALUK.

Area.—172·84 square miles.

Population.—1,12,141.

No. of Houses.—23,752.

No. of Voters.—39.

No. of Pakuthies.—10.

Taluk Town.—Kottayam.

Location.

Division.—Headquarters of the Kottayam division, and is situated about the centre of the Division.

Boundaries.—NORTH.—Ettumanoor Taluk and Minachil Taluk. The Minachil River marks the boundary between Ettumanoor and Kottayam Taluk for many miles and afterwards cuts through the Taluk to Vembanad Lake.

SOUTH.—Changanacherry Taluk.

EAST.—Peermade Taluk.

WEST.—Vembanad Lake.

Railway.—The nearest Railway Station is Ernakulam, and is 39 miles away, of which $37\frac{1}{2}$ are by water. Most of the produce is taken by vallam to the rail, when such is required, at Ernakulam.

Backwaters and rivers.—The Vembanad Lake washes the Western boundary of the Taluk and is the chief waterway for produce and traffic to Alleppey, Cochin and other places. It is connected with the centre of the Taluk by a canal to Kottayam, and the Minachil River runs from the Ettumanoor Taluk almost bisecting the Taluk. It is navigable and is used for traffic even beyond Kottayam to Ettumanoor and other places. Smaller canals also are found, leading into the interior. A regular steam and motor boat service runs twice daily from Kottayam to Alleppey and there connects with the Quilon and Cochin boats etc. The reclamation of the Vembanad Lake has added a considerable area of wet land cultivation to the Taluk.

Main roads and Village roads.—The main Central Road runs through the Taluk to Kottayam and thence to Ettumanoor going North and to Changanacherry going South. There is a good main road running to Mundakayam and Peermade and on to Kumili to the outlet into British India.

The village roads all feed the main road and are comparatively in good condition. The main traffic is water-borne. The Mundakayam-Kottayam Transport Co., run a motor-bus service for 35 miles daily to Mundakayam, and from thence a ropeway is being constructed to Peermade. A second bus service runs from Kottayam to Meenachil daily through Ettumanoor. The Anchal motor service runs daily to all places South on the Main Central Road. The Taluk is thus well served with motor transport for passenger and in the case of Mundakayam road, goods traffic also.

Nearest Seaport.—The nearest seaport is Alleppey and is reached entirely by water. The distance is 20 miles. The produce of Taluk can easily and cheaply be taken by Wallam. The distance to Cochin is 39 miles and is also reached by water. Hence, certain of the export produce is taken to that port also, as shipping is often more readily available.

Cultivation.

Wet Land Area, 20,806 Acres.

Dry Land. 46,687 Acres.

Area under cocoanut cultivation, 10,019 Acres.

Pakuthies.

Name of Pakuthy.	Area sq. miles.	Population persons.	Wet land acres.	Dry land acres.	Cocoanut land acres.
Tiruvrappu	18.46	6440	4949	547	547
Kottayam	4.87	2300	1642	1287	...
Nattagam	9.42	6580	3072	2077	1000
Panichakkadu	8.73	6010	1537	3866	300
Vijayapuram	25.77	19010	3156	12592	3000
Pambadi	26.59	14190	...	...	...
Agalakunnam	37.66	18960	468	23227	2000
Aimmanam	13.45	12440	4920	2618	2700
Kummanam	2.53	3880	1063	472	472
Kumaragam	25.36	7190		...	Large area

Education.

GOVERNMENT BOYS' VERNACULAR SCHOOLS.

No. of H. G. Schools,	8.	No. of Boys,	2060.
		No. of Girls,	149
No. of L. G. Schools,	20.	No. of Boys,	2091
		No. of Girls,	153

BOYS' AIDED VERNACULAR SCHOOLS.

No. of H. G. Schools,	4.	No. of Boys,	666
		No. of Girls,	155
No. of L. G. Schools,	89.	No. of Boys,	4859
		No. of Girls,	3243.

GOVERNMENT GIRLS' VERNACULAR SCHOOLS.

No. of H. G. Schools,	3.	No. of Girls,	690
No. of L. G. Schools,	11.	No. of Girls,	947

GIRLS' AIDED VERNACULAR SCHOOLS.

No. of H. G. Schools,	2.	No. of Girls,	343.
No. of L. G. Schools,	9.	No. of Girls,	861.

ENGLISH SCHOOLS.

Name of School.	Grade.	No. of Forms.	No. of pupils.	
			Boys.	Girls.
Government English School, Kumaragom	L. G.	1	33	7
C. M. S. School, Kottayam	H. G.	6	659	
M. D. S. School, Kottayam	"	6	340	
M. T. S. School, Kottayam	"	6	215	
C. M. S. School, Pallam.	L. G.	3	115	14
C. M. S. School, Olesha	"	3	91	9
St. Joseph's Girls' School, Kottayam	"	3		83

INDUSTRIAL SCHOOLS.

Name of School.	Place	No. of pupils.	Staff.	Subjects taught.
Mulamkulam Ind. School	Mulamkulam	33	3	Rattan work and Basket-making.
Chingavanom Ind. School	Kottayam	33	3	Basket-making and General Subjects.
C. M. S. Ind. School	Kottayam	20	4	Carpentry and Black-smithery.

NATURAL PRODUCTS AND THEIR PRESENT UTILISATION.

Paddy and Rice.—Agriculture forms the staple Industry of the Taluk. There are large tracts of tapioca-land and also $\frac{1}{3}$ of the area of the Taluk is wet land for paddy. The crop is an annual one and only harvested once per annum. The bulk of it is consumed locally. There is a rice-mill working in the Taluk. The bulk of the paddy is consumed locally.

Cocoanut products.—The Western portion of the Taluk forms the cocoanut area. Over $\frac{1}{10}$ of the area of the Taluk is cocoanut-land and over 4 lakhs of trees are cultivated. The chief difficulty in many parts of the Taluk is a lack of soaking facilities and large quantities of husks are wasted annually because no coir-extraction is possible. The introduction of coir-extractors here would materially benefit the people and place the industry on a much better footing. The waste, would be avoided. Most of the coir is produced near the lake and is exported direct to Alleppey and Cochin. Kumara-gom is the main centre of the cultivation and extensive topes are found there. The industry is well organised.

Tapioca.—The Eastern portion of the Taluk grows Tapioca well. Particularly is this the case in the southern pakuthies. Pambadi, Panachikad, Vijayapuram, and all along the Main Central Road, Nattagom, etc., there is ample scope for tapioca. Large areas of tapioca land are fallow for various reasons, and, if a mill was established at Tiruvella for Tapioca flour, this would be one of the first places that would have to be brought under cultivation to meet the demand. The attention of the ryots should be drawn to this, now, and landowners who are, at present, apathetic towards the cultivation of waste land should be urged to further the cultivation of tapioca. What is really required is scientific and systematic cultivation on a large scale over large areas, and, if this is done, then, the supply of raw material for a factory would be assured. A factory should certainly be established in this district.

Arrowroot.—Between Kottayam town and Changana-cherry, arrowroot grows wild and freely. It is also found cultivated in compounds. Near Kottayam in Kummanam arrowroot grows well also. It is, at present, used locally only and no organised attempt has hitherto been made to extend the industry. There is a great demand outside Travancore.

for the flour, and also a considerable quantity of St. Vincent and other brands of arrowroot flour are imported into the State annually. The extraction of the flour is now done as a cottage industry by local and crude methods which are wasteful. It consists essentially of crushing the washed root and boiling the whole in water. The resulting mass is roughly sieved and crushed in a hand-mill. The flour obtained contains much foreign matter and is impure. A handworked Tapioca machine would be more efficient, but, even then the product is too costly for the market. The proposal to establish a Tapioca-flour-factory as above would help greatly as the machinery could also be adapted and used for the arrowroot extraction. Large orders have already been placed with this Department, but lack of organisation and scientific extraction have prevented the acceptance and fulfilment. This is an Industry eminently suited to Kottayam Taluk and one which is capable of development.

Lemon grass.—Lemon grass oil is little extracted in the taluk although the raw material is found in plenty. Particularly is this the case in the eastern portions of the taluk. The grass is similar in quality to the species found further south, and has a citrol content in the oil of about 60 per cent. A properly equipped still at Kottayam could handle the produce of the district profitably. The industry awaits revival and development.

Sugar-cane.—Kottayam Taluk can be said to be the centre of the Sugar-cane district. North and south are found large areas under sugar cultivation along the banks of the rivers, particularly at Ettumanoor and Tiruvella. The four pakuthies, Nattakom, Pampadi, Kummanam and Akalakunnom all situated in this taluk produce sugar-cane. The present method of dealing with the produce is to crush it between iron rollers which are bullock-driven. The juice so obtained is boiled in copper pans and then the molasses and jaggery are allowed to settle in wooden tubs. This molasses is largely exported to Alleppey and other places for consumption as jaggery and a fairly high value is generally maintained for the same. This high price is said to mitigate against the success of a sugar-refinery here as the price obtained for the refined sugar is not so much higher than the jaggery as to make a fair profit on the refining process. However, there is a sugar-mill at Ettumanoor which is well equipped up to a certain point and would succeed if it had a

full equipment and Rs. 30,000 working capital, together with expert management. I would recommend, however, that something of a much smaller nature could be set up locally, and that a plant costing much less to be driven by animal or oil engine of small horse power could be installed. Such plants are now available in India and these small factories would pay in so much as they do not involve big outlay and the working capital required is small as the quantity of raw material used per day is small. The cultivation, at present is not extensive enough to support a big refinery at any one place and, if the refining industry was built up at the same time as the cultivation is increased, it will be the best way of developing the industry, to supply a small refining plant suitable for this purpose, probably Rs. 5,000 would suffice for a small factory. In any case, the whole question is important and should be carefully considered by the local people. Details of a small plant to handle 3 tons of sugarcane in 10 hours when the sugar cane crushing mill is driven by cattle power or a small engine are—

1 Sugarcane mill	Rs. 465.
1 Sulphur column with air blower	Rs. 456.
1 Suction tank, pump and strainer	Rs. 212.
1 Set evaporating pans with furnace	Rs. 1,368.
1 Set galvanized sheets and brass strainer cloth	Rs. 320.

Roughly Rs. 3000 is required for machinery alone. Working capital would be extra. These are figures from an actual current quotation.

Ginger.—This is grown for local consumption and also for export from the Northern pakuthies. The presence of Sugar in large quantity and of the raw ginger would suggest a ginger preserving industry. The Japanese and Chinese ginger is largely imported in jars and also exported to Europe. The jars generally in use for packing are made of Earthenware. All round the rivers there is plenty of clay suitable for such jars and Kaolin is also found near. Potters also are found in the vicinity but they need instruction in the art of Glazing. The industry could well be taken up alongside fruit-preservation and it is a suggestion for the people to work out.

Arecanut.—There are about 2 lakhs of trees in the Taluk and these furnish a source of income to many. The nut is dried and exported to Alleppey and Cochin. Kumara-gom and Akalakunnam are important areas.

Pepper.—Formerly this was a large pepper growing area, but the industry declined here with the rest of the cultivation in the State. The quantity now grown is dried and exported through Alleppey. There is no reason why this cultivation should not be revived and efforts should be made to send out the finished pepper powder rather than the raw material.

Plantains and bananas.—These grow exceptionally well here. Larger plantations are found, and great export of the fruit is done. The fibre is wasted and the flour is not collected. A plantain fibre industry on a cottage scale could be built up in the Taluk, and if a control depot were established for receipt of the same it would succeed. Plantain fibre can easily be extracted by first crushing the sheath between rollers. The sheath is then drawn between a flat plate and a blunt knife, the edge of which is resting on the plate and the degree of pressure obtained by an arrangement of springs. The fleshy matter is thus removed. The shredded sheath is then beaten on a flat board and the fibre is extracted as long lengths. This can be used for cordage, etc., and fetches a price of £ 20 per ton. If boiled with Ammonium Carbonate, Sodium Bicarbonate and cocoanut oil it is softened and can be woven into soft cloths like cotton. The flour is valuable for invalid food and the skins are rich in alkali.

Other products.—Yams and vegetables are grown for local needs only.

Trees and timber.—Jack, Mango, Teak, Angeli, Rosewood all grow in the Taluk. Travancore Payin is also found as well as Kapok. The forest regions contain much valuable timber and fuel for industrial purposes exists very close.

Minerals.

Graphite.—Small quantities of graphite have been noticed at Vazhoor. The extent of the deposit is not fully known.

Pyrites (Iron).—Pyrrhotine occurs in Vazhoor near to the graphite.

Lime-shells.—These are found in large quantities on the shores of the Vembanad Lake. At present they are collected, and lime-burners render them into Quicklime for building and other purposes. These shells are largely used and greater quantities are available than are now collected. The deposit at Vijayapuram is particularly good and in need of development. At Kumaragom the shells are particularly suitable for the manufacture of cement.

Existing Industries.

Agriculture.—The great majority of the people are interested either directly or indirectly in agriculture. Paddy cultivation covers over one-third of the Taluk. A large area is under tapioca cultivation, and also about 4 lakhs of cocoanut trees are cultivated. The number of large land-owners is small, but the number of small cultivators is fairly large. It can be said that there are about 18,000 small land-owners and probably about 20,000 agricultural labourers, in fact, they form the majority of the population. The cultivator's income varies with the amount of his land, and can generally be stated as about 400 to 500 rupees per annum. The cost of living is fairly high, and a cultivator on a small scale has little left to develop his land after all expenses are paid. Coolies are available in large numbers but a large proportion go to work on the tea and rubber estates of the Peermade Taluk. The wages are, in consequence, good, and realise a minimum of four annas per day. From the wet land one crop per annum is gathered and a large part of this is found in the Vembanad Lake reclamation area. In consequence many people are occupied in building up the bunds around the enclosed fields, and a lot of work is also done at certain seasons of the year in pumping out the water. Formerly, this was done by foot-paddles and many of these still exist. The more modern oil-pump is now used with great profit to all concerned. The implements for agricultural purposes are brought mainly from Cochin and the local artisan, here, as elsewhere has proved himself unequal to the demands made on him. There are large areas under sugarcane cultivation along the river banks. The crushing is done locally and the cane is of a good quality. However, the cultivators are largely in the hands of the merchants who buy their molasses, as they are largely without money as capital, and have to accept advances of money in order to cultivate their land. When the crop is ready it is already mortgaged and in consequence, there is little money left for improvement of their methods and purchase of manure. Government demonstration of manuring-methods was highly successful but the people were unable to follow it without borrowing on the security of their land at high rates of interest. Some means of freeing capital for purely industrial purposes would be an advantage and seems necessary before much can be done. There are a few rich merchants who could help greatly in these matters in the Taluk, and if their co-operation is secured enough money

could be realised. The lot of the poor cooly is not an enviable one, and, here also many of them live on the charity of their landlords. In many cases no rental is charged but the person renders service to the landlord, either as watcher over cocoanut trees or in agricultural pursuits in return for his permission to live in his compound. The cooly is not in constant work and it averages in this Taluk about 20 days in each month. Tapioca, sugarcane, and arrow-root cultivation are a long way from being fully developed here and in the future these important crops can be and should be greatly increased.

Coir and Copra.—As already mentioned, the coir and copra industry is confined to the western side of the Taluk. In these parts water for soaking is plentiful on the shores of the Vembanad Lake. Large topes are found at Kumaragom and proper cultivation is done in these parts. The chief difficulty in the interior is the lack of water for soaking, and the introduction of some form of coir-extractor is now necessary. This would prevent an annual wastage of fibre, and husks now used as fuel could be more profitably dealt with. Since some of the larger merchants have capital, it would pay to start a proper factory for coir extraction in Kottayam using mechanical power and machine of large capacity. The manufacture of Indian Whisk and Brushes from the same could be undertaken. The coirworkers number some thousands and the women do the beating in most cases. The earnings of the coir-worker vary greatly but average about six to nine chuckrams per day. This leaves no margin when food has been purchased. With reference to copra the large quantity produced is almost entirely sent to Cochin or Alleppey by vallam to be pressed for oil. Many local bullock-driven mills are found, and are working to supply local needs, but the oil is chiefly extracted in factories outside the Taluk. In the Vijayapuram Pakuthy there is a suggestion that an oil-mill would be of great advantage to the people and that such a mill established here would be successful. A soap-factory and candle works could possibly be supported also. Coir making is carried on in practically the whole of the Vijayapuram Pakuthy, and copra making in Kottayam, Nattagom, Panichicad, Pampadi, and Vijayapuram and could be done in Kummanam. In Kumaragom coir yarn making and copra manufacture is the staple industry. A weaving school for coir workers has been started at Kumaragom and is known as the "Kumaragavilasom Weaving

School". The manufacture of coir mats can well be introduced here as a cottage industry.

Weaving.—This Taluk has practically no weavers at all and if one or two are found here and there that is all. There is a great need throughout the Taluk for weavers who can weave cloths of the cheaper and commoner variety for local use. There is plenty of scope for a weaving establishment here, but beyond the local needs cloths are available from other places when the better variety is desired. In Kottayam there is scarcely one yarn merchant, and Alleppey is the nearest supply depot. Weaving on a small scale would find success in this district.

Sugar and Molasses.—The industry has been fully discussed under sugarcane. In Kottayam itself we find about one dozen big merchants dealing in this commodity alone. As already mentioned the process of extraction and the quantity produced can be greatly improved and increased. The molasses is largely exported to other places and if a small sugar-refinery, efficiently controlled with expert advice and with sufficient working capital to give advances of money to cultivators at reasonable rates of interest, were started, then its success would be assured. The question of giving advances is an important one as this is the method which is in vogue at present for securing the raw material. Attention should certainly be paid to the industry and its development.

Pottery.—The abundance of clay in these parts and more particularly towards Ettumanoor and again near Changana-cherry has produced an abundance of potters. Large numbers are in constant employment and not only are the local needs supplied, but export to other places such as Tiruvella and Mavelikara is carried on. Brick-making is also carried on and along the rivers the industry is thriving. The potter can earn from Rs. 6 to Rs. 7 per month when working fully, and a brick-maker will get from Rs. 10 to Rs. 12 and even more if in full work. Much more can be done here and as already indicated if glazed pottery was produced it would find an abundant and ready market. The glazing is an important addition and it would assist the fruit-preserving-industry and also supply the needs of many people in India. This class of goods is greatly in demand and orders have been offered to us and had to be refused on account of

inability to fulfil them properly. Demonstration and instruction in this could easily be given in the School of Arts, Trivandrum and with a little organisation the industry could be highly successful.

Basket-Making.—Basket-making is carried on by the Pulayas at Moolancolam and other places. Rattan work is also done. The chief difficulty is the supply of raw materials and the canes cost Rs. 15 per 1000 and Rs. 2 per 1000 for reeds. These have to be cut and carried some distance to the people before they are used as they are found inside the forests. About 70 families are engaged in the works and each family averages 5 or 6 persons. A single person working in his spare time adds about Rs. 2 per month to the family income. The ordinary wages of the workers are 6 chuckrams a day for men and $3\frac{1}{2}$ chuckrams for women. The average family income is 10 chuckrams per day but this is not certain. The development of a basket-making industry is therefore a great help to these otherwise unskilled coolies, and might be encouraged with a co-operative depot for the extension of cottage industries. The people have no rental to pay as they live in their landlords' compounds. The market for the goods is a good one, and large quantities are required both at Kottayam and Chengannacherry. They can also be exported to Alleppey. As a cottage industry this can be developed greatly.

Printing.—There are 5 printing presses in the Taluk, namely, The Manorama News Paper Company, Kottayam, The Church Missionary Press, and the Mar Thoma Press, The V. G. Press, and The V. V. M. Press. The Manorama and the V. V. M. Press produce News Papers and the other presses do general printing and book-binding. Quite a number of people are engaged in this work and about 100 work-people are connected with the various institutions. There is a great need felt for trained and skilled workmen, and if these were available quantity of the work would be improved and the variety would be greater. The wages of the employees vary considerably, and it is difficult to give any figures. A skilled workman is well paid, but it is difficult to secure his services. Much of the work is done by unskilled labourers. A central school for instruction in printing would be a boon to Travancore.

Fishery.—Along shores of the Vembanad Lake and in the rivers and backwaters there are many people engaged in

fishing as a livelihood. The industry is an important one and more than 200 people are engaged. Many of the fishermen are also engaged in building up the bunds for the Vembanad reclamation area. The fish caught is consumed locally and the industry is practically confined to local needs. It is not very remunerative and five to six rupees is the average monthly earning.

Walking sticks.—The Kottayam Industrial Works managed by Mr. Koshy John is working successfully, producing walking sticks, bentwood chairs, penholders, etc., in fact all small articles made of wood. As a result of his experiments, it is found that the manufacture of walking sticks, for which there is a large demand in the country, could be carried on entirely with Travancore raw materials. The sticks now manufactured out of such material not only compare favourably with the foreign articles in the market, but are admitted by experts to be even superior to them. This is also borne out by the fact that the sticks are largely in demand by some of the Madras Firms and that a large consignment was sold recently to some of the leading firms in Trivandrum, Quilon, and Ceylon. These and other firms are prepared to place extensive orders. The materials for these sticks are collected from the Travancore Forests. The polishing and staining materials are entirely from local vegetable products. The Travancore Forests will afford these materials for a successful industry perennially. At present, the firm employed is unable to cope with the large orders they receive. To establish the industry on a firm and businesslike footing and to manufacture the articles on a larger scale so as to meet the local and foreign demands a small initial capital is necessary. Working singlehanded a man makes 50 sticks per month. Allowing for all fluctuations in the market a maximum wholesale price of Rs. $\frac{1}{4}$ each can be realised. To produce 300 sticks a month, an initial outlay of Rs. 200 is necessary and recurring expenditure of about Rs. 200. If these are sold even at Re. 1 each there is a handsome profit. This industry could never become a big one by itself but if bentwood chairs and other articles were also added the industry could be made a very successful one on a cottage basis and possibly small factories could be established. In any case the industry can be worked up as it utilises indigenous materials only.

Bamboo Work.—Alongside the above, bamboo work and the manufacture of bamboo furniture could easily be worked

up and would find a ready sale. Raw materials are plentiful and cheap, and what is required is a method of instruction and an organised depot for the collection of the goods.

Motor Engineering.—A Motor garage for the Munda-kayam Motor Transport and a depot for the Meenachil Motors are working in Kottayam.

Possible Industries.

Tapioca and Arrowroot.—This has been already discussed fully. The industry for extraction of the flour from both roots could be established and would pay well in this district.

Sugar.—Small sugar factories suitable for the wealthier ryots and capable of turning out about 6 cwts. of sugar a day could be made to pay here. This has been already dealt with in this report.

Brush-Making.—If coir extractors were used, then bristle fibre for the manufacture of brushes could be obtained in large quantity and the industry could be established here with success. The raw materials are all available locally.

Fruit Preservation.—Ginger and fruits could be preserved and if this industry was worked alongside a sugar producing plant it will be highly successful.

Plantain Fibre, etc.—As already mentioned this could be made a successful industry in the Taluk.

Weaving.—There are few local weavers and a properly organised institution should pay well.

Knitting.—As a cottage industry for the women-folk small hand-machines for knitting and making banians, etc., could be introduced from a central co-operative depot exactly on the lines explained in Mavelikara Taluk. Lace and embroidery could also be introduced on the same basis.

Basket-making.—This industry has already been fully described and is a source of income to many. It can still further be developed amongst the poorer people.

Rubber.—Most of the Travancore Rubber from Munda-kayam passes through Kottayam, and taking into consideration the enormous quantities conveyed, it would seem a good place for the establishment of Tyre Factories and other rubber goods. Fuel is easy to obtain and this would seem a favourable place to establish such an industry. The only drawback is the lack of railway facilities. Closely connected

with this is the question of Wood-Distillation for Acetic Acid. The raw materials, for example cocoanut shell, are found in plenty and are cheap. If a still was installed at Kottayam and acetic acid produced it could supply the rubber estates in the vicinity both with the acid and tar. The quantity of acid now imported into Travancore annually comes to a value of more than Rs. 25,000 and as the rubber estates develop this demand is fast increasing. The Japanese article is already on the market and the attention of the Kottayam people is called to this industry, as a sure market awaits the products at their doors. See general report for data.

Cabinetmaking.—One well-known firm of cabinet makers is already working in Kottayam near the landing stage. There is an increasing demand of furniture of all kind throughout the whole district and if this was properly organised bamboo furniture and wooden articles could be made for local sales. The C. M. S. Industrial School is directing its attention to the question, but proper capital and direction as to proper designs and patterns are necessary. At present about 12 persons are engaged in the work.

Foodstuffs used and available locally.—Rice, Tapioca, Yams, Arrowroots, Plantain, Jack, Mango, and Vegetables. Fish is also an important article of food and is obtained from the rivers and backwater. Cloths and articles of apparel are imported.

Economic Statistics.

In all occupations, excluding large landowners and professional gentlemen, there are about 40,000 skilled agricultural workers, masons, carpenters, oil-pressers, weavers, etc., in the Taluk. A rough division is as below; but the figure given for number of workmen is only approximate owing to the difficulty of gathering accurate information locally.—

Name of craft.	Number of workmen.	Daily wages.
Carpenters.	400	8 to 10 As. per day.
Masons.	260	10 As. a day.
Blacksmiths.	270	Contract work usually average monthly income Rs. 10.
Potters.	100	From 6 to 7 rupees per mensem.

Name of craft.	Number of workmen.	Daily wages.
Printers.	100	This includes all the workers in the printing establishments. The wages vary according to skill and the nature of the work.
Basket makers.	70 Families.	Rs. 5 to Rs. 6 per mensem for full work.
Coir makers.	Some hundreds.	6 to 9 Chs. a day according to skill.
Motor Mechanics.	Number varies.	Rs. 25 per month for a skilled workman.
Coolies.	Some thousands.	6 to 9 Chs. per day.

Cost of living.

Cultivator's family.—25 to 30 rupees per month.

Cooly's family.—5 to 6 rupees per month and compound produce. Average wages just balance normal expenditure. The cooly does not work more than 15 or 16 days each month and his income is uncertain so that he lives a hand to mouth existence often starving.

Single person.—8 to 10 rupees per mensem.

Number in family—Cultivator.—5 to 10 members on the average.

Cooly.—4 to 6 persons.

Number of people qualified as voters.—39 persons.

Number of professional people etc.—The Kottayam town is the head quarters of the Division and many officials, vakils, etc., are found in connection with the Government institutions. It is also the headquarters of various religious bodies and large numbers of people are connected with these organisations. There are a large number of schools and a College so that the professional community is very large and can be put down as some hundreds. There are also a large number of tradesmen and merchants in Kottayam and many of these are wealthy and influential. Many people also are dependent upon them for work as clerks, etc. At least 15 merchants can be described as wealthy.

Existing Co-operative Societies.

Name of Society	Working capital.	Profit in 1092.	Number of members
Kumaragom Co-operative Credit Society.	Rs. 7,382	Rs. 248 5	65

Registered Joint Stock Companies.

Name of Company	Capital. Rs.
The Malayala Manorama Co., Ltd.,	10,000
The Malayala Kudumba Sakaya Co., Ltd.,	10,000.
The Malamkara Rubber and Produce Co., Ltd.,	4,50,000.
The Malabar Agricultural and Industrial Co., Ltd.,	4,50,000.
Mr. Joseph & Co., Ltd.	20,000
The Mundakayam Peermade Motor Transport and Aerial Ropeway Co., Ltd.,	6,00,000.
The Kerala Bharathi Co., Ltd.,	20,000.
The Central Travancore Industrial Co., Ltd.,	1,00,000.
The Travancore Plantations Co., Ltd.,	20,000.
Kottayam Agricultural and Commercial Banking Co., Ltd.	10,000.
The Kumaragom Krishi Vevasaya Co., Ltd.,	1,00,000.

Capital.

From the foregoing statement it can be seen that over 13,00,000 of rupees are registered as the capital of the Joint Stock Companies, in Kottayam. Of this, 6,00,000 belongs to the ropeway company in which much European money is invested. Even without the sum it can be seen that large amount of capital is available for industrial development and there is no doubt that in Kottayam there are merchants with money to invest in good industries. The ryots have not much money to invest, and co-operation has only raised some 7,000 rupees in the Taluk. There is, however, every opportunity for financing a reliable concern.

Remarks.

This Taluk might be described as one of the most convenient industrial centre for Central Travancore and there is every scope for the establishment of the larger industries described above. Expert management and scientific development are essential. With regard to the capital the Taluk is better placed than most others in Travancore.

MAVELIKARA TALUK.

Area—	111.43 square miles.	Population,	2,09,790.
No. of Houses		No. of Voters.	231.
No. of Pakuthies.	15.	Taluk Town.	Mavelikara.

Location.

Division.---Form the central portion of Quilon Division.

Boundaries.—NORTH. The Achenkovil River marks the Northern Boundary. Across the river Chenganoor Taluk.

SOUTH.—Kunnatur Taluk.

EAST.—Kunnattur Taluk.

WEST.—Kartigapalli and Karunagapally Taluks.

Railway.—Kottarakara, is the nearest Railway station, and is reached entirely by road, *viz.* Main Central Road from Pandalam. The Eastern portion of the Taluk is 21 miles from Kottarakara station. Pandalam to Mavelikara Town is 12½ miles.

Quilon is also near, and from the Western portion of the Taluk is the nearest Railway station. The distance from Mavelikara is 6 miles by road to Kayankulam and 25½ miles backwater to Quilon. Total 31¼ miles.

Backwaters and Rivers.—The boundary of the Taluk is formed by the Achenkovil River, and it is navigable for the greater portion of the year. This forms the main waterway of the Taluk. Kayankulam, Thiruvella, and Chengannur can all be reached by backwater, river and canal. The waterways are used very largely for traffic. In the southern portion of the taluk the canals to Kayankulam take a large portion of the produce. A proposal has been made to widen the River at Vettiar and this would facilitate the carriage of goods by water to the remoter and eastern portions of the Taluk. The banking of some of the smaller canals would be of advantage and could easily be undertaken by the people themselves. Kayankulam is the nearest Backwater lake.

Main Roads and Village Roads.—The Main Central Road runs through the eastern portion of the Taluk. Good roads run from Pandalam to Mavelikara and Adur to Kayankulam, through the Taluk. The state of the village roads leaves

much to be desired. Particularly in Vallikunnam Pakuthy the road running from the Main Road to the centre of the pakuthy is a sandy waste and uncartable. Again at Kannamangalam Pakuthy the roads are sandy. The road running from Thekkakara to Pallikkal is a bad one and often under water. These roads mean that the produce of the Pakuthy has to be headloaded for miles and thus by the time it reaches Kayankulam market the price is enhanced so that the people cannot compete with others who are nearer. The conveyance of manure for agricultural purposes is also a serious problem. The people can do much to alleviate this themselves and the first item in the programme of Industrial development here is the betterment of the means of communication in the pakuthies and the outlet roads from the villages to the main roads and Canals.

Nearest Seaport.—The nearest seaport is Alleppey and distance from Mavelikara town is 29 miles.

Cultivation.

Wet Land Area— 19,700 Acres. Dry Land.— 41,330 Acres.
Area under Coconut cultivation.—11,000 Acres.

Pakuthies.

Name of Pakuthy.	Area sq- miles.	Population. persons.	Wet land acres.	Dry land acres.	Cocoanut land acres.
Vallikunnam	8.30	8700	1454	3093	2000
Thamarakulam	8.07	51000	867	3708	170
Bharanikavu	9.06	16840	2233	2759	1600
Chunnakara	6.54	6000	1112	2517	120
Perungala	4.96	10380	1372	1284	600
Thekkakara	8.37	13620	1812	3129	1600
Kannamangalam	5.58	11410	1390	1511	850
Mavelikara	2.59	18000	263	980	700
Tazhakara	9.96	11910	1651	4202	1400
Nuranad	8.14	6400	1127	3479	170
Palamel	9.89	6850	1021	4068	400
Panthalam	9.75	8170	1210	4378	430
Thonnallur	11.54	12700	1467	4695	460
Chennithala	2.44	7800	498	726	540
Tiruperunthurai	6.24	12000	2222	800	260

Education.**GOVERNMENT BOYS' VERNACULAR SCHOOLS.**

No. of H. G. Schools, 11. No. of pupils, 2488 boys. 251 Girls.
 No. of H. G. Schools, 23. " 3337 " 291 "

VERNACULAR AIDED SCHOOLS.

No. of H. G. School, 1. No. of pupils, 179 boys. 17 "
 No. of H. G. Schools, 78. " 4978 " 2136 "

VERNACULAR UNAIDED SCHOOLS.

No. of Schools, 43. No. of pupils, 1763.

GOVERNMENT GIRLS' VERNACULAR SCHOOLS.

No. of H. G. Schools, 4. No. of pupils, 1148 girls.
 No. of L. G. Schools, 6. No. of pupils, 605 "

GIRLS' VERNACULAR AIDED SCHOOLS.

No. of L. G. Schools, 5. No. of pupils 441 girls.

BOYS' ENGLISH SCHOOLS.

Name of School.	Grade.	No. of Classes.	No. of pupils.	
			Boys.	Girls.
H. G. E. School, Mavelikara	H. G.	6	752	69
Special L. G. E. School	L. G.	3	27	
C. M. S. English School, Kattanam (aided)	"	Prep.	27	6
M. G. English School, Thumpaman (aided)	"	3	134	15
Bishop Hodges English School, Mavelikara	H. G.	6	134	30

GIRLS' ENGLISH SCHOOLS.

No Girls' schools have been started. The nearest schools are at Tiruvella.

INDUSTRIAL SCHOOLS.

Name of school.	Place	No. of Pupils.	Staff.	Subject taught.
Onattukara Weaving School	Mavelikara	25	2 teachers	Weaving.
Illippakulam Weaving School	Mavelikara	25	2 teachers	Weaving and mat-making.
Ezhava mat-weaving School	Mavelikara	30	1 teacher	Mat weaving.
Sri Padmanabha Vilasom Weaving School	Vallikunnam	20	1 teacher	Weaving.

Natural products and their utilisation.

Paddy and rice.—Used locally. There are 19,700 acres of wet land or roughly $\frac{1}{10}$ of the area of the taluk. A rice-mill is working at Mavelikara for husking the rice. It is worked by a 20 H. P. Hornsby oil-engine and has two hullers. Work is not constant, however, and the mill is working only 3 or 4 days per week. This is due to the lack of capital of the owners and also to the fact that the people do not use the mill fully. The bulk of the paddy produced is used locally.

Cocoonut products.—About $\frac{1}{4}$ of the area of the taluk is cocoonut land. The western part of the taluk contains practically the whole cocoonut area. The chief difficulty in some of the pakuthies is the lack of water supply. Tanks have been filled up in some places and in Perungala pakuthy this is particularly felt. The husks are sent by head-load to Kayankulam for soaking. The introduction of fibre-extracting-machines would be a great help here. The Kannamangalam pakuthy is the foremost for producing copra, and this is done on raised tables with fires underneath, when the sun fails in monsoon time. A large export trade in copra to Alleppey through Kayankulam is done.

Tapioca.—In the eastern portion of the taluk tapioca grows well. A few remarks on the various pakuthies are appended.

Tamarakulam.—Tapioca grows well here though not in large quantities. The cultivation could be greatly increased.

The extraction of flour on a small scale is done by the cottagers for culinary purposes.

Thekhekara and *Mavelikara*.—The root grows well in both these pakuthies. The tubers are used mainly for food. Little or no extraction of flour is done.

Tazhakara.—The tapioca grows well in this pakuthy. The merchants grind it to powder in many cases. The cultivation could be increased.

Nuranad.—The local ryots estimated that about two square miles of waste land could be brought under Tapioca cultivation. There is certainly a large area that could be so treated.

Pandulam.—This pakuthy has also much Tapioca-land lying waste. At present the price of tapioca here is 5 fanams for a load. (About 60 to 70 lbs.)

The whole taluk has not been fully exploited for tapioca by any means and the local ryots could profitably turn their attention to the matter. If a flour-mill is established, it is from this area that the tapioca would be drawn largely, as being nearest to Tiruvella which is a most suitable place.

Arrowroot.—This grows wild throughout the taluk but is found in larger quantities in Vallikunnam and Chennithala pakuthies than any others. At Chennithala the cottagers use it for extraction of flour but this is only for home consumption, and it is not done on a large scale. Something could be done to grow the root more largely as the demand for it as a foodstuff is great, and the demand for the flour greater.

Lemon grass.—Lemon grass grows wild in Tamarakulam, Chunakara and Nuranadu. It is also found in other parts of the taluk. At Chunakara the grass is still cultivated and definite areas set apart for its cultivation. Formerly at Tamarakulam about 5% of the people were employed in this industry of distillation, but owing to decline of markets this has died out completely. The old stills are remaining in many cases. At Chunakara there are stills working now, but the business done is not as good as it might be. The oil so distilled is not so good as the oil from the northern taluks of the State and contains only about 50 to 60% of Citrol. The cause of the decline of the industry is primarily the low Citrol contents and secondarily

the adulteration by water and other matter which ruined the oil commercially. Bad methods of distillation also added to the crisis as the oil produced was very impure. Resinous matter and dirt, together with water were present in large quantities and no definite standard of purity could be obtained. The present price of the local oil in Kayankulam is Rs. 21 for 12 bottles. Our Bulletin on this industry shows that steam distillation is necessary to effect the purification of the oil.

Sugar.—Very little cultivation of Sugar-cane is done in this taluk. At Perungala and at Mavelikara small cultivation is carried on. At Tazhakara about 20 acres of cane are grown. More land is available for this cultivation both here and at Tirupuruntura.

Poonam Pine.—The poonam pine grows wild throughout the taluk. Round the stone of the fruit is a red coating which is used as a dyestuff. Before the war this was collected and sent to Alleppey. It is locally stated that the raw material for the dye went to Germany.

Cinnamon.—Fairly large quantities of Cinnamon are grown in Chunakara, Thekkakara, Thazhakara and Nuranad. This is chiefly exported to Kayankulam and thence to Alleppey. The cultivation of Cinnamon might be encouraged here.

Ginger.—This is grown in Thazhakara and is exported. The local price is Rs. 25 per candy. This might be preserved.

Grams.—Grown throughout the whole taluk and used locally.

Kapok.—Kapok cotton is found throughout the taluk. In some pakuthies the trees are in large numbers. Many are now being cut down. The demand for Kapok cotton is increasing and its utility is being fully investigated during the present time. As a stuffing for pillows and mattresses and also for lifebelts, it is very efficient and valuable. There is a future before this commodity and it should be carefully collected and the industry preserved. The manufacture of mattresses could be undertaken by the local weavers on the Nagerecoil pattern loom. This would be a good thing for them. The seeds yield a valuable oil for soaps and other commercial purposes and the resulting "Poonnak" is a valuable

cattle food. These points have not been developed at all and should receive attention.

Gingelly, Jack, Mango, Yams, Pepper.—These are minor products and used for local consumption only. They are chiefly found in the compounds of the local ryots.

Plantains.—These grow in abundance in all parts of the taluk, but no proper cultivation is undertaken on a large scale. At Nuranadu a few larger plots than usual are devoted to this fruit. The development of the plantain industries, Alkali, flour, fibre etc., could be done.

Trees and timber.—The following trees are found in plenty throughout the taluk.

Jack, Angeli, Mango, Kapok, Odal, Tamarind, Perumaram, and other soft woods, Marottie, Pinnay and Travancore pine.

The Pinnay oil is made throughout the taluk in the local presses. The resin from the Travancore payin is utilised. Vide Bulletin of this Department.

Other products.—The screw pine exists in abundance and mat-making is extensively done throughout the taluk by the poor people. (See note under industries.)

Minerals.

Pyrites.—At the 8th milestone on the Mavelikara-Pandalam road Cubical crystals of pyrites were found in small quantities at a depth of 30 feet. The full extent of the deposit has not been investigated.

Graphite.—A good deposit of Graphite was found in the Athira Hills near Pandalam. The mineral was found at the surface over a considerable area. The analysis showed a fair percentage of graphite. The proximity of the lacquer workers should indicate pencil-making as a possible industry here.

Mica.—Mica is found at the surface in Palamel Pakuthy over an area of one acre. The deposit has not been investigated. Also at Nuranadu and Tonallur.

Iron ores.—Traces of Iron oxide were found at Nuranadu, Vallikanam and at Tamarakulam; the ore existed at the surface in rock formation. The exact quantity was not determined.

Kaolin.—At the 5th milestone at Tazhakara and at Tamarakulam deposits of Kaolin are found. The former at a depth of 20 feet and the latter near the surface. A tank at the latter place was bedded with impure Kaolin.

Laterite quarries.—These are found at Thekkakara and worked locally. The bricks so obtained are exported by wallams to Alleppey and other places. Laterite occurs in other parts of the taluk also.

Clay.—At Thekkakara, Pandalam, Tirupuruntura and in other places there exists plenty of clay suitable for tiles and pottery. At the two latter places tile works could be established and are badly needed locally. The necessary capital is available locally and has been promised.

Existing Industries.

Agriculture.—This is the chief industry of the taluk and the majority of the people are connected with it in some form. Large and small landholders and farmers number over 10,000 and agricultural labourers about 15,000. Most of the former class also work on their own land and are skilled agriculturists. The ordinary farm worker receives about 10 chuckrams per diem as pay, and this is taken in food and paddy as well as in cash. There is no rental here as a rule. Either the farmer is the owner of his land or the tenant renders some personal service to the owner in return for house room. These men spend about 9 rupees per person in normal times for living expenses each month. They are in fairly constant work. The average income of a cultivator owning his own land can be estimated at about Rs. 400 per annum. His cost of living is fairly high and the average man has little left to spend on manure and improvements to his land and occupation. His cost of living for himself and his family works out to an average of Re. 1 As 8 per diem. His annual expenditure is thus about Rs. 500 to about Rs. 570. His income is at the lowest Rs. 400 on the average. The lower the income the more liable are debts to accrue, and we find the poorer ryots badly in need of loans. The deficit is usually made up by compound produce being available for food. It can thus be seen that improvement of agricultural methods can be only slow in progress so long as actual money is so scarce. The larger landowners act also as money lenders to the smaller men, and mortgages lawsuits, interest to be paid, all follow and are to the detriment of agricultural development. A land bank and

Agricultural co-operative societies with effective working and true co-operation are badly needed. At least 10,000 unskilled coolies earn a precarious livelihood by agricultural work of various kinds. They live always on the verge of starvation. Many of them eat, if they obtain work and pay, and starve, if unable to secure work. They, however, usually have small compound produce to eke out with, but even then they do not live on sufficient food. The average wages of the coolies, here, are 7 chuckrams per diem and this is usually paid in kind. The cost of living is fully this amount. A cooly family has usually two or three earning members and so when one works the other is often out of work and *vice versa*, so that the income, though small and inadequate, is fairly constant. The coolies work about 12 to 15 days per mensem on the average and is most unreliable. He works out of necessity to maintain himself with food. There are 19,700 acres of paddy land in the Taluk and this is about 3/10 of the total area. The great need is for skilled workmen in subsidiary trades to Agriculture. Blacksmiths' work goes to Quilon to be done, and Carpenters are imported. The local men are absolutely to blame. On all hands the ryots complain that if the work is given locally the delay in delivery is too great, inferior work is done and the local artisan is unreliable. Promises of delivery at a stated time are only made to be broken. Prices are inflated to rich men and deflated often if the workman is in need of funds. No fixed rates of payment or charges exist. This is a great drawback to the former who cannot get the repairs to his implements done easily and quickly. An industrial school in this taluk would do well to train men for Agriculture Implement making and repairing as part of a course of blacksmithery and carpentry.

Coir and Copra.—This has already been partially discussed in this report. Oil-pressing, and Coir yarn manufacture, are the most important industries in Perungala. Vallikunnam and the other pakuthies of the western portion of the Taluk. In Perungala all the raw materials are obtained locally. The great difficulty is that of the water supply for soaking. The husks have now to be taken to Kayankulam to be soaked and brought back to be beaten. About 15000 husks per diem are thus taken for soaking. The transport is done by bandy and the distance is about two miles. To give a concrete case. Before soaking the husks cost 5 chuckrams per hundred, and after soaking and transport

charges the price rises to 6 or 8 times as much. Fibre extracting machines and soaking tanks could be introduced, and would materially benefit the ryots to a great extent. At Vallikunam there are over 300 coir-workers. Oil-crushing is very common throughout the Taluk. The work is done chiefly by local and bullock-driven presses, but nevertheless these are profitable and find plenty of work. Oil-crushing is most thriving in the Western parts of the Taluk. It is found that one para of local gingelly gives about 3 edangalies of oil and locally this is worth 24 fanams. A single press can earn Rs. 1/5 per diem or between 9 and 10 fanams. One press in particular was observed at Perungala. The cost of crushing was roughly about two chuckrams per para, and four or five paras were crushed per diem. The procedure here was that the press-owner took the oil and the coolie or worker who manipulated the press took the poonak. In 1917 the lowest price of copra was about 60 rupees per candy in Vallikunam and Perungala and much of it went to Alleppey. At Vallikunam, over 40 persons were regularly engaged in Copra preparation. Oil-pressing can be regarded as one of the main industries of the Taluk. At Bharnikavu water for soaking is badly needed. At present, the nuts, husks etc., are exported to Alleppey from Kayanculam $4\frac{1}{2}$ miles away.

Weaving.—There are two weaving institutions in the taluk and a number of local weavers scattered about the various villages. These local weavers produce only the commoner types of cloth and the cheaper varieties for local wear. They fill a real want in the country requirements, and whilst larger establishments would not pay, these men earn a fair livelihood by meeting the needs of the local public. The distribution can be set out as follows.

Vallikunam.—There is a school here for weaving run by local effort. 5 looms and one warping machine were installed. The yarn consumed was about two bales per mensem. One teacher on Rs. 25 was engaged. The products of manufacture were local cloths and checks. The fly shuttle loom was used. The yarn came from Madura and Tinnevely. The number of pupils was 20, and they attended for 3 hours daily. The manager stated that sales and expenditure balanced, and he was not the loser on the school's account. Besides this institution, there were three local weavers in business on their own. They stated that they earned about Rs. 15 per mensem when yarn was plentiful, and that they had ready sale for heir goods locally.

Thamarakulam.—There are 6 families of weavers in the pakuthy, but they only do local work. Their weaving is only a subsidiary occupation to agriculture.

Bharnikavu.—There are about 8 weavers in the pakuthy and it is carried on as a cottage industry. A typical case can be quoted. The weavers all live by the side of the Main road to Kayanculam. The weaver used $1\frac{1}{2}$ bales of yarn per mensem. In prewar days this did not involve a great outlay, which was 5 to 10 rupees per mensem at most. He was able to make 80 cloths per month and sold these locally at as. 4 each. The warping, sizing etc., was all done locally. His family, consisting of a wife and two children assisted in the work and he was able to earn about 12/- rupees per month as his profit. A similar statement was made by other weavers.

Perungala.—About 10 weavers used to work here but their looms now stand idle. Scarcity of yarn and abundance of cocoanuts are the causes of decline. Agriculture and coconut cultivation were more profitable, and thus weaving was stopped. Local weavers are needed.

Kannemangalam.—There is a weaving Institution here with 20 looms. At present this is playing the double role of School and business, and receives Rs. 25/- per mensem as grant from Government. The goods made consist of towels, cloths, checks, and jamkals. The working of the Institution leaves much to be desired for efficiency, but Government have now the Institution under regular inspection. The Institution could be a source of profit and great utility.

Tazhakara.—At Mavelikara town in the Tazhakara pakuthy, there are a large number of weavers who have deteriorated in their business. Formerly, a caste industry they have steadily declined, and at present they earn a precarious living making strips of cloth for underclothing. These small and narrow strips are sold only locally. About 7 or 8 families are engaged in the work. Formerly they were weavers but owing to financial troubles and lack of business-methods they have failed. They live on credit at the local bazaars and they are in a poor condition. They have no business-ideas, and, if their business is to be revived, training in up to date fly-shuttle weaving and the principles of business and co-operation is essential. A cooperative depot is needed to guide and instruct them.

Nuranadu.—About nine weavers work here as a cottage industry to supply local needs.

Pandalam.—At Tonallur and again at Pandalam there are isolated weavers. Three looms are working. The Tonallur loom is not of the fly shuttle variety, whilst the other two are. The case of the Tonallur worker can be taken as typical. He purchased one bale of yarn from Quilon each month on the average; but if extra busy $1\frac{1}{2}$ bales were used. These varied in cost with the market prices. He made about 5 towels a day and sold them locally. His monthly income was Rs. 10/- clear of all expenses. His wife and five children assisted, and they had a small compound with 5 coconut trees and a tapioca plantation.

Chennithala.—There are about 7 families of weavers here who make rough towels. The yarn is obtained from Alleppey.

Tirupuruntura.—About 8 families of weavers are found here. Many have discontinued work and taken up Agriculture. Others have joined Government Service after attending school. The few looms remaining are worked very irregularly, and only as a subsidiary occupation to agriculture.

Mat-weaving.—In this taluk the screw-pine flourishes and is utilised for mat-weaving. The leaves give a soft, pliable and almost waterproof mat. It is exceedingly suitable for packing. The leaves are cut and sun-dried. They are then split to the required size and woven. The weaving in Mavelikara taluk is a cottage industry done mainly by the women. In the case of double mats the edging is done by men. In this way as much as Rs. 3/- per mensem is added to each woman to the household income. Practically this weaving is done by all the low caste women and forms a staple part of their income. The mats are cheap and find a ready sale in local markets. Large quantities of mats are offered at Kayankulam, and are exported to Alleppey and other places. The difficulty in this industry is, as in other cottage industries, that there is no organisation for the proper collection of goods. Raw materials are without cost and well distributed, but there is no regular price for finished articles, nor do the workers understand a fair price for their labour. This question will be solved by a co-operative depot but the people are not sufficiently advanced to understand these principles. If regular firms can be encouraged with definite orders and markets for their goods this will be the best way out of the difficulty. Peoples, at present, make three sorts of screw pine mats.

1. Large mats used for drying grain and paddy, measuring 30 ft. by 15 ft. and known locally as *chikku-payai*. The price of these mats will be anything up to Rs. 3.

2. Coarse mats measuring 3 ft. by 7 ft. is used as bedding and known in Malayalam as *Tazhapayai*. This variety is sub-divided into two kinds.

(a) The leaves are boiled before weaving and give a beautiful soft feeling and white appearance to the strand. A finished mat cost from annas four to annas 12 or even Re. 1/- according to quality.

(b) Unboiled leaves. The mat is cheap and cost from one to 3 As. only. This variety is excellent for packing purposes, being waterproof and durable.

3. Fine mats in two layers measuring 7 ft. X 3 ft. called in Malayalam "*Metha payai*". The price is from As. 10 to As. 12, as a rule, although very superior ones will cost as much as Rs. 4 or Rs. 5. These are used for bedding and are very beautiful.

These cottage industries are old and well-established and with proper guidance and organisation can be made a great boon to the poor people of the villages of this Taluk. The majority of the poorer people do this work. They carry it on as a cottage occupation subsidiary to coolie work and agriculture.

Lacquer workers.—At Pandalam there is a small settlement of lacquer workers numbering 15 families and about 120 persons altogether. They are hereditary lacquer workers. The earnings of a skilled workman are up to Rs. 30 per mensem. Bulletin No. 2 of this Department deals with this Industry at length.

Pottery.—Although there is plenty of clay for pottery in the taluk and tiles and pots are all imported, there are very few potters. Several reasons have been given for this. The reluctance of landowners to allow the clay to be taken, the lack of capital, the lack of skilled workmen and advice, and the fact that it is very menial labour without machinery. The first reason has some foundation, the second is not correct as two offers have been made at Pandalam and Tirupuruntura by rich men to finance such a business. The third can easily be remedied and the fourth is quite true. If tile works and potteries are established it is obvious from local

conditions as enumerated above that they must be up to date. There are many local potters starving in other places. The distribution of potters throughout the taluk is roughly, Pandalam...4 or 5 persons, Tonallur... 7 families. Chunnakara 1 family (9 persons), Vallikunnam... 30 persons. These people are not organised nor do they improve their methods of work in any way. They are declining and the industry is dying out. The reasons are not that there is no demand or that there is no clay, but that they seek a social uplift through education and other sources, and seek less arduous employment. In the absence of any organisation to show them an uplifting influence in their own craft, they are letting it die out. These people need expert direction and financial backing to regain their former proficiency and prosperity.

Minor Industries.—Throughout the taluk we find isolated craftsmen. At Mavelikara there is a bell-metal and bronze-working establishment. The man employs 4 bronze-makers, a carpenter and a blacksmith. The bronze-worker gets 12 As. per day. His living expenses came to As. 8 per diem. His children were sent to school so that he had little balance left if any. Culinary utensils etc. were made for local requirements.

Masons, Carpenters, Wood-carvers, Toddy-drawers, and Basket-makers, and goldsmiths are found in different places, and are invariably supplying local needs only. (See later).

Toddy-drawers are found in most of the pakuthies. About 2400 trees are tapped annually. For the right of tapping a Government tax is imposed. The tapping is practically all for the production of liquor and not for jaggery.

Basket-weavers from bamboo are found very rarely. They live in Nuranadu and number about 20 families all told. They earn on the average As. 6 per day and sell their products at Tazhakara market. There is also a ready sale at Tamerakulam. The raw materials are available in large quantities and are brought from Tonallur, Pandalam and Chenganoor. The basket weavers fetch the raw materials themselves and they pay for them at the rate of 10 chuckrams per 100 sticks. The weaver cuts and carries the sticks himself. Each family takes up agricultural work as well, and only a few members of each take up this work as a subsidiary industry. It can be greatly developed and is in need of

a wider market. This is not difficult to find as the demand is great.

Tailors are scattered throughout the Taluk, though not in such numbers as to meet the demand. In Nuranadu there are three tailors, and in Mavelikara there are about 7 or 8.

Printing.—There are two printing presses in Mavelikara namely the Keralabhimani Press and the George Coronation Press. The former publishes a newspaper whilst the latter does general work. Some 30 people are thus engaged.

Possible Industries.

INDUSTRIES REQUIRING LARGER CAPITAL.

Cocoanut Industries.—There is scope in the South western portions of the Taluk for Brush-making, Coir-weaving, Oil-pressing, and other cocoanut industries on a large scale. Factories should be established near or at Kayangulam for this purpose. The present produce is all taken to Alleppey, and, if the factory were nearer, the transport would be cheaper for the finished product. The introduction of fibre-extractors would facilitate the brush industry by producing bristle fibre. The details of the industry, at present, are already recorded and what is now required is a factory on a large scale to deal with the local produce.

Pottery and tiles.—It has already been discussed under this heading in a previous paragraph. Capital and clay are forthcoming, and the local demand is assured. It is hoped that in the near future these industries will be permanently established in a modern and up-to-date manner. Pandalam and Tirupuruntura are the best sites in the Taluk, and capital is ready in both places.

Tapioca.—Probably a factory on a large scale for the extraction of Tapioca flour would best be established at Tiruvella. The north eastern portions of the Taluk and the central portions are near, and the area of Tapioca land could be greatly increased. The details have already been dealt with in this report and the practical suggestions in Bulletin No. 8.

Soap and candle making.—This could be done successfully in this Taluk on a fairly large scale. The oil is plentiful and the transport easy. The difficulties at present, owing to the war prevent immediate starting of this industry.

Pencil making.—As already suggested in Bulletin No. 2 pencil manufacture could be started at Pandalam. Graphite is near and skilled lacquer workers are in the vicinity.

Varnish.—Bulletin No. 4 of the Department deals fully with the varnish industry in Central Travancore. The Travancore Payin exists in abundance, and systematic and scientific extraction is necessary.

COTTAGE INDUSTRIES.

Weaving.—This has been dealt with at length. What is required here is local weavers throughout the Taluk to meet purely local needs. The more expensive cloths need not be woven, but what is required is that the manufacture of Towels and cheaper cloths be undertaken. This local weaving can well be taught at the weaving schools and the local weavers assisted in the purchase of yarn by a Central depot for cottage industries. They can also be instructed in new methods and improvements from time to time by the same Institution.

Lace Industry.—The chief difficulty in the establishment of the lace industry here is that the market would be difficult to obtain. In S. Travancore the Industry is under European supervision and this is essential as it is a European industry with a definite history and historical patterns. Bulletin No. 3 deals fully with this question. Unless cheap and efficient supervision is obtained as in South Travancore by the ladies of the Missionary Societies the industry would be difficult to maintain.

Sericulture.—This is an industry that would be successful in the Eastern parts of the Taluk. The reeling of the silk would be a good cottage occupation and it is to be commended to all.

Cadjan making.—This is already a thriving cottage industry. It could be greatly enhanced.

Hosiery and knitting.—For the women in the homes a possible industry is the knitting of vests, socks etc. by machines and by hand. The large number of Japanese goods which are on the market testify to the demand. A Central depot for teaching, supply of wool and yarn, and collection of finished products is necessary for this, as for weaving and other industries.

Mat-making and Basket-Weaving.—New designs should be introduced and new ideas taught. Baskets for the wider markets and export could be made and small trinkets and

other articles produced. Toy making might also be taught. The Industry has already been fully discussed in this report. A central teaching and control depot is highly necessary.

Foodstuffs used and available locally.—Rice Tapioca, Jack, Mango, Yams, Plantains and Vegetables. Fish is available from the rivers and backwaters.

Economic Statistics.

In all occupations, excluding large landowners and professional gentlemen, there are about 25660 skilled Agricultural workers, Masons, carpenters, oil-pressers, Weavers, etc. in the Taluk. A rough division is as below :—

Name of craft.	Number of workmen.	Daily wages.
Carpenters.	700	8 to 12 As per diem according to skill and district.
Masons.	120	8 to 10 As. per day.
Blacksmiths.	70	12 As. to Rupee 1 per day. according to skill.
Goldsmiths.	50	Contract work. Up to Rs. 20 per month.
Sawyers.	70 families,	8 Annas to Rupee 1 according to diligence.
		Generally only 10 days work each month.
Weavers.	About 60.	Rs. 12 to Rs. 15 per mensem.
Potters.	About 60.	From 6 to 9 rupees per mensem.
Coir-makers.	About 500, skilled workers.	Wages vary and living uncertain. About 8 chs.
Lacquer workers.	About 15 families and 120 persons.	Rupee 1 per day.
Mat-weavers.	Many hundreds.	The mats are woven as time permits and sold locally.
Tailors.	10	As. 8 to Rupee 1 per day according to skill.
Coolies.	some thousands.	About 7 chuckrams per day

COST OF LIVING.—(NORMAL TIMES.)

Cultivator's family. 15 to 25 rupees per mensem according to family.

Coolies' family.—6 rupees per month and compound produce. Average wages just meet expenditure if normal.

Single person.—7 rupees per month for cultivator.

Number in family. *Cultivator.*—5 to 7 persons on the average.

Coolies.—4 to 6 persons.

Number of people qualified as voters, *i. e.* paying over Rs. 50 land tax.—221.

Number of professional people. (Vakils, School-Masters etc.)—About 400.

Existing Co-operative Societies.

Name of Society.	Working Capital.	Profit in 1092	Number of members.
Puthiakavoo Co-operative Credit Society (Agricultural).	Rs. 2,006.	Rs. 27/8.	46.
The Nadakavoo Co-operative Credit Society. (Agricultural).	Rs. 3,567.	Rs. 55.	48.
The Vattakattu Devivilasom Co-operative Credit Society (Agricultural).	Rs. 1,826.	Rs. 49/12.	59.
The Mangalodayam Co-operative Credit Society (Agricultural).	Rs. 742.	Loss Rs. 6/12.	21.
The Onattukara Co-operative Credit Society, (General).	Rs. 62.	Rs. 5/12 profit.	11.
The Mavelikara Co-operative Distributive Society, Ltd., (General).	Work not started in 1092.		
Total Co-operative Capital in the Taluk.	Rs. 8,203	Total profits Rs. 131/4.	Total No. of members. 185

Capital.

The Capital raised by Co-operative effort up to the end of 1992 was very small. True co-operation has not yet found root in the Taluk. For the cottage industries co-operative depots must be started and the industries thus financed by the people themselves. The Government depots proposed should ultimately become co-operative institutions.

The Capital available for larger concerns is about Rs. 1,000. per Pakuthy. At Pandalam and Tirupuruntura about 5,000 to 7,000 Rupees are available at each place. These would be invested in tile works. The Taluk has not much ready capital and all the money is invested in land. Unless some method of freeing this capital is devised there is not much available for Agricultural or industrial development. There is also a reticence and timidity on the part of people to invest in Industrial concerns owing to failures. These were due to lack of working capital or inefficient management or inexpert control. Demonstration is the only method of convincing the people and even then the Agricultural results show that they are very cautious.

Remarks.

There is only one power-driven mill in the Taluk namely, the Rice Mill at Mavelikara. Here a 20 H. P. Hornsby Oil-Engine is installed, but only two hullers are used, and 8 H. P. at least is wasted. The Capital of this company is Rs. 4,500 and this is insufficient. The rice from outside is said to be cheaper and local people do not patronise the mill. The result is that the mill only works for 4 days or so each week. This has a bad effect on the starting of other Industrial concerns. If the mill were fully capitalised the whole of the power could be used and local paddy bought in for husking. There are excellent Blacksmiths at Kanne-mangalam who are well-skilled and famous throughout the district. They make all kinds of cutlery of a good quality. They are, however, leaving their old calling purely because of lack of business, enterprise and knowledge, and already members of the family are in Government service as music masters and peons. This is to be deeply regretted. They are not businesslike and the local people prefer to go to Quilon and elsewhere to get goods as they are reliable for time of delivery and quality. Lack of ready cash is also another failing as they have little working capital. This industry will die out if something is not done to revive it.

Pottery is a great necessity. At Nuranadu most of the cooking utensils are imported from Chenganoor, whilst good clay is at hand locally, and potters are unemployed or leaving their craft.

Gunny bags were formerly made at Nuranadu. The growing of this hemp is also discontinued. At present and for many years to come, this Industry would be one of great profit. The thousands of salt-bags that are required annually are a guarantee of a local market. Every effort should be made to revive this important industry here, for its success is certain.

KARTIGAPALLY TALUK.

Area.—74·26 Square Miles. Population.—101,440 persons.

No. of Houses.—35,240. No. of Voters.—229.

No. of Pakuthies.—18. Taluk Town.—Haripad.

Location.

Division.—Situated in the Northwest portion of the Quilon Division.

Boundaries—NORTH.—Ambalapuzha Taluk.

EAST.—Mavelikara Taluk.

SOUTH.—Karunagapally Taluk.

WEST.—Arabian Sea. (Coastal Taluk Boundary).

Railway.—Nearest Station is Quilon... 30 miles from Haripad and 31 miles from Trikunnappuzha. From Trikunnappuzha there is the regular Alleppey-Quilon Boat Service on the backwater.

Backwaters and Rivers.—The western portion of the Taluk is on the backwater, and easy transport of all classes of goods is afforded thereby. The Achenkovil and Pamba rivers pass through the Taluk. They are navigable for most of the year and also assist cultivation.

Main roads and Village roads.—Direct road from Quilon to Haripad 30 miles. Good road to Mavelikara 8 miles. Village roads are in need of improvement. About half the produce of the Taluk is headloaded.

Nearest Seaport.—Alleppey is the nearest seaport and is reached by backwater.—26 miles.

Cultivation.

Wet Land Area.—24,436 acres. Dry Land area.—17,848 acres.
 Area under cocoanut cultivation—14,054 acres. Unregistered land area. 7,259 acres.

Pakuthies.

Name of Pakuthy.	Area.	Popu- lation.	Wet land.	Dry land.	Cocoa- nut land.
	Sq. miles.	per- sons.	acres.	acres.	acres.
Haripad.	1.47	7470	473	2407	330
Cherutana.	5.42	4100	2607	528	133
Cheppadu.	1.94	11760	726	473	473
Valiakuzhi.	2.97	3590	1249	564	564
Karthigapally.	3.37	5440	914	935	950
Singoli.	2.81	5310	1080	607	592
Kizhakekara.	2.21	2460	1126	248	248
Viyapuram.	5.38	4530	2600	373	378
Kirikadu.	3.39	1230	1112	983	1086
Kandaloor.	3.77	1430	1521	848	848
Kumarapuram.	5.60	6800	1652	1614	1613
Karivattar.	5.58	5560	2300	1100	1010
Mudukulam.	4.49	8540	1790	1010	1010
Arattupuzha.	8.79	5020	400	1080	200
Pattiyoor.	5.83	11600	1660	1880	1880
Pallipadu.	4.75	6850	2170	740	310
Nangyarkulangara.	1.79	1890	790	305	345
Trikunnapuzha.	4.70	7430	267	2165	2200

Education.**GOVERNMENT BOYS' VERNACULAR SCHOOLS.**

No. of H. G. Schools, 7. 2708 boys. 287 girls.
 No. of L. G. Schools, 13. 1821 „ 420 „

AIDED SCHOOLS.

No. of L. G. Schools, 20. 1553 boys. 601 girls.

UNAIDED SCHOOLS.

No. of Schools, 28. No. of pupils, 1192.

GOVERNMENT GIRLS' VERNACULAR SCHOOLS.

No. of H. G. Schools, 3. 1016 girls.
 No. of L. G. Schools, 5. 812 „

AIDED SCHOOLS.

No. of L. G. School, 1. 108 girls.

GOVERNMENT BOYS' ENGLISH SCHOOLS.

Haripad M. P. D. L. G.-3 forms. 221 boys. 36 girls.
 School.
 Cheppad (unrecognised) L. G.-Prep. 34 boys. 8 girls.
 M. P. D. School Puthia- L. G.-1 form. 56 boys. 13 girls.
 vila (unrecognised).

GOVERNMENT GIRLS' ENGLISH SCHOOLS.

No English School for Girls has been opened. Nearest schools are at Alleppey & Tiruvella.

INDUSTRIAL SCHOOLS.

At present no Industrial School is established in this Taluk. A movement has been inaugurated to open one at Haripad, for grass-mat-weaving, coir industries, etc.

Natural Products and their present utilisation.

Paddy and rice.—The product is entirely used for local consumption. There are 24,436 acres of wet land.

Cocoanut products.—This is the second industry of the Taluk, and over 14,000 acres are under cocoanut cultivation. The husk is soaked in the backwaters and coir is extracted from it by beating. The poorer people follow this occupation. The copra and coir are exported chiefly to Alleppey by backwater. The western portion of the Taluk is sandy. Local oil-mills driven by bullocks are plentiful, and the oil produced is consumed locally. There is great scope for improvement and development of the coir industry here. Mat-making and the allied industries should be developed and taught in an industrial school if it is established.

Plantains.—Chiefly used as foodstuff. The cultivation is scattered about the Taluk but no big plantations are found.

Tapioca, Mango, Gingelly, Pineapple, Gram, Jack.—Purely minor products are cultivated for local consumption.

Sugar cane.—The cane grows on the river banks but is not extensively cultivated. It is locally crushed and made into jaggery.

Trees and timber.—Travancore pine grows in the avenues along the main roads and is plentiful. Maravotti, Pinnai, Perumaram, and Anjeli grow in plenty. The two former yields much oil, used locally. Tamarind trees are scattered here and there.

Other products.—Grasses and screw-pine for mat-making grow in abundance. The latter is used at present for mat-making as a cottage industry, but the former is badly in need of development. On account of the large number of cadjans here, the match industry, using the centre stalks as match sticks, could be developed.

Minerals.

This Taluk has not yet revealed any mineral wealth. Good clay for pottery and tiles is found in many places.

Existing Industries.

Agriculture.—The majority of the people of this Taluk are connected with agriculture in some way or other, and we find that no fewer than 6000 can be classified as farmers and small or large land-owners. That is, they own their farms, and cultivate the land as a source of income, employing workmen to do the actual cultivation whilst they supervise and do the business. Skilled agricultural labourers number about 14,000 and they receive about 7 or 8 Chuckrams per diem as pay. This is often paid in paddy and food. The houses occupied by these labourers are generally on their employer's estates where they take the part of watchers in return for the privilege of living there. In normal times, the cost of living for such a labourer is about 6 chs. per diem, and this leaves a bare margin over his earnings. Should ill-fortune come in any form then the man has recourse to starve or borrow. These men have more or less regular work. The coolies who have only casual manual labour, are in great number and receive five to seven chuckrams daily. They live always on the verge of starvation. Five or six chuckrams per diem is the cost of living in normal times. The cooly, however, does not get constant work, and the average shows that from 15 to 20 days per mensem are the maximum days of labour. On the remainder, he starves or ekes out with small produce of his compound. There are over 24,400 acres of paddy land in this Taluk and this is a little over half the area of the Taluk. There is need for improvement in agricultural methods, but what is also required is the provision of skilled masons, carpenters and blacksmiths for the making of agricultural accessories and appliances.

Weaving—Weavers are found in three places in the Taluk.—Trikunnapuzha, Haripad and Keericaud. They deal exclusively with commoner cloths, and are weaving only

for local requirements and markets. The yarn used is brought from Alleppey. The average earnings of a weaver varies from Rs. 10 to Rs. 12 per mensem in most cases, but where the other members of the family assist, the earnings are increased to Rs. 15. The weaver has his small compound to assist with its produce. The sizing of yarn is done in the old-fashioned way. Altogether about 5 or 6 families in this Taluk are weavers, two of which are at Haripad. They are not of a weaving caste, but have learnt the industry from various sources.

Coir and copra.—This has already been {discussed under natural products. It is the industry next in importance to agriculture. Over one quarter of the Taluk is under coconut cultivation. The coir industry should be further developed and a school for instruction in coir mat-making etc., might be established with profit. The scientific working-out of the industry is essential for the future security of the wealth of the Taluk in this commodity.

Mat-weaving.—This is done by low caste people as a cottage industry, and the material used is Screw-pine, which is plentiful in the district. The mats are woven and taken to the local markets where they fetch varying prices up to 8 As. according to quality. Finer mats cost even more (see note in Mavelikara Taluk). The poorer people are mostly skilled in this industry which is purely an additional source of income to the earnings of the cottagers. Women make the mats in odd moments during the day.

Pottery.—Krishnan Namburi has set up a pottery for the manufacture of glazed pottery of all kinds near Haripad. He has equipped his workshop so as to turn out 500 pots per month. As frequently pointed out in other reports, the manufacture of glazed pottery has a great future; this industry could be developed greatly. Orders have now been given for pots suitable for the packing of preserved fruits and if successful it will greatly assist this industry. At present lead glaze is used in the pottery & special ovens used for baking the pots. The work of this man will be watched with interest & helped as much as possible.

Other Industries.—Fish-curing is done to a limited extent at Arattupuzha, and a few families are so employed. Masons, carpenters, and goldsmiths are scattered throughout the Taluk and meet local needs. Wood-sawyers are found in this taluk as members of the Kamala caste. About 40

families are found. A typical case or two can be taken to show how these people live. One sawyer living at Haripad earned 7 Chs. per diem and his noon meal. He usually worked from 12 to 15 days per month. His family consisted of 9 persons. Two brothers also earned 7 Chs. per day, and thus the total income was 21 chs. per day. Their daily requirements were one para of paddy and 4 chs. worth of other articles. No rental had to be paid as they possessed their own compound of value Rs. 150. This they offered as security for loans when they were starving and had no work. The monthly income of the family was about Rs. 10 As. 8 for nine persons. In pre-war days this was insufficient for their full sustenance and they made up the deficit by compound produce, mat-making, etc. The usual procedure was to spend their daily earnings and to take no thought of the morrow. Brass-workers are found in isolated places but only two families work on this.

Printing.—There is one printing press in Haripad, namely the Tharaka Press which publishes a newspaper and undertakes general work.

Defunct Industries.—There were formerly salt-pans in this Taluk but these have been closed. The question as to whether a better method of salt manufacture could not be taken up here is suggested for consideration. This probably might be done with profit.

Possible Industries.

Cocoanut Industries.—An oil-mill to which might be attached a soap-factory could be established here with a sure supply of raw material. Gingelly-oil, maravotti, and pinnay oil are available, besides cocoanut-oil in plenty. The area would not support a large factory, but a capital of rupees 10,000 to 20,000 should be available before this project is started.

The coir industry as has been pointed out above can be improved and developed. Machines for extracting coir could be introduced and the production increased.

Rice Mill.—Rice Mills have not yet been established in this Taluk. The nearest is at Mavelikara and it would probably have been more profitable at Haripad. The Mavelikara Mill does not work full time. This is due to lack of working capital and also insufficient paddy in the district. Together with this Taluk it should be kept fully at work. This is an instance where a little forethought in the choice of a site would have benefited a large area.

Cottage Industries.—Grass-mat-making would be highly successful in this Taluk. Preliminary work should be done in finding out the best grasses that grow or will grow here for this purpose. Many of the local grasses are suitable. A school to instruct in this industry would be necessary. This could be part of the depot, that might be established.

Mat-weaving and basket-making from screw-pine could be greatly improved and developed as cottage occupations.

The large number of cadjans available annually has led to the suggestion that a match-factory could be established. It is doubtful if this would be the best site, but the centre stalks are in plenty and might easily be utilised in this particular.

Foodstuffs used and available locally.—Rice, Tapioca, Yams, Peas, Plantains, Jack and Vegetables. Fish and meat are also consumed largely.

Economic Statistics.

In all occupations, apart from landlords and professional people, it can be said that about 20,000 skilled agricultural labourers, masons, weavers, carpenters and other artisans can be found in the Taluk. The following can be set forth as a rough division :—

Name of craft.	Number of workmen.	Daily wages.
Carpenters ...	280	Varying from 9 to 12 as according to skill.
Masons ...	35	Average 10 to 12 as.
Goldsmiths ...	10	Work done by contract price
		Monthly earnings Rs. 20—but vary according to demand.
Blacksmiths ...	Very few.	There are good smiths near in Mavelikara Taluk who do the work necessary. Much of the work could be done locally if men were available and reliable.
Sawyers ...	40 families.	7 chs. per day and noon food.
Weavers ...	5 families.	Varying upto Rs. 8 or 12 per mensem.
Coolies ..	Some thousands.	About 4 as. per day.

Cost of living.—Cultivator's family.—from 22 to 52 rupees per mensem.

Cooly's family.—up to Rs. 10 per mensem.

Single individual.—Rs. 6 per mensem.

Number in family.—Cultivator.—6 to 9 persons on the average.

Cooly.—3 to 5 persons on the average.

Number of people qualified as voters, 229.

Number of professional people (Vakils, etc.,) about 70.

Existing Co-operative Societies.

Name of Society.	Working Capital.	Profit in 1992.	Number of members
The Mar Thoma Co-operative Credit Society (Agril.) ...	Rs. 1948	Rs. 79/8	52
Yuvarajavilasom Co-operative credit Society (Agril.) ...	Rs. 3730	Rs. 104/12	66
The Plappizha Co-operative Credit Society (Agril.) ...	Rs. 1321	Rs. 24/8	40
The Lekshmiyijayam Co-operative Credit Society (Agril.) ...	Rs. 5227	Rs. 127	71
The Chingoli Sanmarga Sandhayan Co-operative Credit Society (Agril.) ...	Rs. 2666	Rs. 90/8	88
The Muttom SadhujanaParipalana Co-operative Credit Society (Agril.) ...	Rs. 1067	Loss Rs. 10/8	32
Total Co-operative Capital in the Taluk ...	(Rs. 15959)	Total number of members.	299

Capital.

The capital raised by co-operative effort is seen to be Rs. 15,959. This capital was raised purely for Agricultural purposes. The number of co-operators is small compared with the population. For cottage industries much more co-operative capital must be raised and more effort put forward in this direction. There are no Joint Stock Companies registered in the Taluk. The capital available for various larger industrial projects is difficult to estimate as there is a reticence on the part of the investors. However, from figures actually given, in all Pakuthies but two, at least Rs. 2,000 would be available. In some places much larger sums could be obtained if a confidence was inspired in the industrial concerns. Few people are willing to risk their money except in land purchase and others are unable to obtain a ready cash to do so owing to its being locked up in land. It is here that a Land Bank would be useful in order to free capital for industrial and agricultural development

and improvement. With difficulty Rs. 40,000 could be raised in the taluk for industrial and agricultural work.

Remarks.

The taluk statistics show that the whole district needs development and that it has not risen to its full industrial capacity. For cottage industries a co-operative depot, on the lines indicated in the general report, should be started at Hari-pad, and this should include the industrial school. Mat-weaving, basket-making, coir mat-making, and grass mat-manufacture should be taught. The industries should be in close touch with the Central Government Museum, and Bureau. Most of the produce of this taluk is conveyed by head-load to the boats and main roads. This is a most expensive method. Local effort should be put forth to metal some of the village roads, and make them cartable all the year round. Several of the smaller canals could be banked up and rendered more efficient for traffic. If the means of communication is not improved, the produce of the taluk cannot be fully utilised. The local ryots could well help themselves in this matter by uniting together to make the roads efficient.

AGASTEESWARAM TALUK.

Area.—94.00 square miles.	Population.—1,04,900.
No. of houses.—24,600.	No. of Voters 56.
No. of Pakuthies—15.	Taluk Town—Edalakudi.

Location.

Division.—This taluk is the southern-most taluk of the State, and is situated at the extreme south of the Southern Division. It is one of the taluks of the Padmanabhapuram Division.

Boundaries.—NORTH—Tovala Taluk. Most of the boundary passes through the hilly country.
 SOUTH—Arabian Sea. Coastal boundary.
 EAST—Eraniel Taluk.
 WEST—The sea, and Tinnevely District, British India.

Railway.—Although Tinnevely is $49\frac{1}{2}$ miles from Nagercoil and Trivandrum is only 42 miles yet most of the rail traffic is sent by Tinnevely. The reason is that the distance from Trivandrum to Tinnevely by rail is nearly 150 miles and additional freight on goods has to be paid for this distance. It is, therefore, much cheaper to send the produce of this taluk *via* Tinnevely as the additional cart hire is comparatively nothing when considered alongside the other charges for rail freight. Most of the goods intended for rail traffic are sent out by bandy along the main road *via* Aramboly. A motor-bus service runs daily for passenger traffic from Nagercoil to Trivandrum and also from Nagercoil to Tinnevely.

Backwaters and rivers.—The backwaters do not reach this taluk at all and communication is by road only. There are two rivers flowing through the taluk, *i.e.*, the Pazhayar and the Puthenar; but neither of these is navigable. The cultivation is greatly assisted by the channels from the Kothayar Irrigation Works, but these cannot be used for traffic. Communication by sea is carried on to a large extent from Colachel in the Eraniel Taluk.

Main Roads and Village Roads.—The main roads in this taluk run from Nagercoil to Tinnevely and from Nagercoil to Cape Comorin. The main central road runs from Nagercoil to Trivandrum in a northerly direction. Another road which is good as far as Parakai runs to Tengampudur, whilst another runs from Capé Comorin to Kovilam. A good road runs to Dharmapuram. The road to Tengampudur crosses the sandy bed of a river at the latter place and this renders traffic difficult at times. In the Thamarakulam Pakuthy, the bridge over the Palayar river is sometimes under water during monsoon time, and traffic is rendered difficult.

Nearest Seaport.—Colachel is the nearest port from which goods can be shipped in big steamers but much of the produce is taken *via* Tinnevely to Tuticorin for shipment, on account of the larger amount of shipping available at the latter port. The distance from Colachel to Nagercoil is $13\frac{1}{2}$ miles by road. Another port named Srimulapuram or Leeapuram near Cape Comorin was once used for shipping but on account of disaster and lack of facilities this has fallen into disfavour. Nevertheless, it could be used today.

Cultivation.

Wet land area, 13,673 acres. Dry land, 6,202 acres.
 Cocoanut land, 1,800 acres. No. of cocoanut trees, 1,08,000.
 Palmyra trees, 4,82,500. No. of Pinnai trees, 1,01,000.

Pakuthies.

Name of Pakuthy.	Area.	Population.	Wet land.	Dry land.
Agasteeswaram	8.14 sq. miles.	7300 persons.	923 acres.	806 acres.
Kanniyakumari	1.08 sq. miles.	5000 persons.	997 acres.	1916 acres.
Kulasekarapuram	5.43 sq. miles.	8500 persons.	593 acres.	719 acres.
Thamarakulam	6.21 sq. miles.	6830 persons.	506 acres.	144 acres.
Nagercoil	4.80 sq. miles.	3220 persons.	741 acres.	87 acres.
Vadiveeswaram	4.12 sq. miles.	8360 persons.	575 acres.	504 acres.
Erachakulam	2.91 sq. miles.	1860 persons.	994 acres.	22 acres.
Vadasserry	7.16 sq. miles.	8550 persons.	2055 acres.	201 acres.
Dharmapuram	4.50 sq. miles.	4910 persons.	7 acres.	136 acres.
Parakka	1.70 sq. miles.		894 acres.	9 acres.
Tengampudur	10.99 sq. miles.	2400 persons.	609 acres.	588 acres.
Eravipudur	3.03 sq. miles.	2810 persons.	1234 acres.	36 acres.
Suchindram	2.08 sq. miles.	1240 persons.	774 acres.	8 acres.
Martunkur	8.73 sq. miles.	3950 persons.	799 acres.	745 acres.
Terur	8.83 sq. miles.	4060 persons.	1965 acres.	790 acres.

Education.**GOVERNMENT VERNACULAR SCHOOLS.**

No. of H. G. Schools, 2. No. of boys, 1332.
 No. of girls, 25.
 No. of L. G. Schools, 16. No. of boys, 1585.
 No. of girls, 272.

AIDED VERNACULAR SCHOOLS.

No. of H. G. Schools, 5. { No. of boys, 1241.
 { No. of girls, 141.
 No. of L. G. Schools, 49. { No. of boys, 2540.
 { No. of girls, 94.

PARTIALLY RECOGNISED SCHOOLS.

No. of schools, 5. No. of pupils, 146.

GOVERNMENT GIRLS' VERNACULAR SCHOOLS.

No. of L. G. Schools, 6. No. of girls, 691.

AIDED.

No. of H. G. Schools, 2. No. of girls, 625.

No. of L. G. Schools, 7. No. of girls, 543.

ENGLISH SCHOOLS.

Government H. G. English School, Kottar, VI Forms,
955 boys, 5 girls.

Scott Christian English School, Nagercoil, VI Forms,
616 boys. ...

S. A. L. English School, Krishnancoil, II Forms,
78 boys, 4 girls.

The Scott Christian College is a Second Grade College
affiliated to the Madras University,

Nagercoil H. G. English School for Girls, IV Forms,
122 girls.

INDUSTRIAL SCHOOLS.

Name of school.	Place.	No. of pupils.	Staff.	Subjects taught
S. M. R. V. Technical School (Govt.)	Nagercoil	26	3 teachers 1 clerk.	Weaving and allied subjects.
Puthalum Industrial School	Puthalum	16	3 teachers.	Weaving and allied subjects.
Krishnavilasom Weaving School	Vadasserry	15	4 teachers.	Weaving and allied subjects.
Narayanavilasom Weaving School	Vadasserry	8	2 teachers.	Weaving.

Natural products and their present utilisation.

Paddy and rice.—Formerly this taluk was not a great paddy growing area, but the facilities afforded by the irrigation scheme from the Kothayar lake have turned many acres of dry land into paddy bearing country. In many places paddy cultivation has replaced cotton, and in others large numbers of palmyra trees have been removed to make way for paddy cultivation. It can be said that there are

roughly 13,670 acres of paddy land in the taluk, and this represents about 23 per cent. or nearly a quarter of the total area of the taluk. Most of this is double-cropped and is harvested twice per annum. The paddy grown is not only consumed locally, but is also exported largely to other places and even to British India. The irrigation canals had a wonderful effect on the country and opened out the land and enriched the owners by conversion from dry to wet areas.

Cocoanut products.—The cocoanut area is practically confined to a narrow strip of land along the coast, and it cannot be said that it is in any sense a great industry in this taluk. The total cultivation only represents 3 per cent. of the area of the taluk and the produce is used locally for home needs. Very little coir making or copra manufacture is done, but a fair number of bullock-driven oil-presses are found in the taluk.

Palmyra Industries.—There are nearly 5,00,000 of palmyra trees in the taluk and this can be regarded as one of the most important products of the district. It employs large numbers of men in many ways. The details of this industry and its future have already been described in Bulletin No. 16 of this Department but a few special notes can be given. The Palmyra tree grows in practically all parts of the taluk and the extraction of fibre, mat-making, tapping for toddy, jaggery-making, are all fully carried on. Our bulletin has shown that only some 20 per cent. of the trees are tapped annually for their various products and local effort should be put forth to remedy this. A consideration of the various products in detail will be of service.

Jaggery.—There is a depot at Nagercoil belonging to Messrs. Parry and Co., where the jaggery of the whole district is collected and allowed to strain. The system of production is simply that the shannar community furnish the climbers for tapping toddy. The daily earnings of climbers varied from place to place. A climber gets from 4 to 8 chs. a day according to skill. In some places he had his salary in kind of claiming the products of the tapping on alternate days. In any case, the tapper is supposed to tap 25 trees daily and since each tree has to be climbed twice per *diem*—morning and evening—he climbs up and down 50 times a day. Taking the average height of the tree as 50 feet it may be observed that the nature of his calling is very difficult, and the remuneration for his work very meagre. With

the help, in Travancore, of a sort of moveable girdle to keep his ankles a certain desired distance apart, he clasps the tree with the palm of his hand and the sole of his feet, leaning the weight of his body on the latter, and ascends and descends by a series of springs in which the hands, then the legs or *vice versa* act simultaneously. In this connection it may also be mentioned that the educated portion of the shannar community induces their brethren, following the profession of climbing the palmyra trees, to take to other more profitable and less arduous walk of life. It is only such of the members of the community as would otherwise be destitute that follow the profession of drawing the sweet juice. In these days the general tendency on the part of the communities supplying professional drawers of toddy is to leave the profession so as to elevate themselves in the social scale. A social elevation is what they desire; and they find their calling is hard when other opportunities are offered to them by education which will replace them on a higher social scale. They readily seize chances of education in order to gain this end, and the educated section finds other means of livelihood of an easier nature than climbing trees. To remove some of these difficulties it is suggested that portable folding ladders could be made which will make climbing less difficult and dangerous. It should be adjustable and capable of any height up to 60 ft. with perfect safety and easily moved on two wheels. Packed up its height should be only 15 to 20 ft. It must be of narrow width capable of free movement between trees and have adjustable feet for levelling, and also handles for support, if wheels are impossible. The ladder should be locally made. If successful it could be let out to cultivators who are unable to purchase.

The sweet juice obtained from the tree is taken by the cottage people and boiled down to make jaggery. Large quantities of these are produced and used for local consumption, but the major portion of it is exported to be made into sugar. The collection of jaggery from the ryots is a simple matter as it is bought up largely by agents. One point that should be mentioned here is that the boiling of the sweet toddy is most done by the women, but now they are taking to cleaner walks of life such as lace-making. This is another cause of the decline of the industry. At present, the boiling is done in earthenware chatties and is a very tiresome process owing to the length of time the person has to maintain a good fire and to the dirt and smoke involved. The

introduction of lace-making has afforded the women an easier alternative employment in their cottages which is lucrative and cleaner. The export of jaggery in 1091 was 1,35,842 cwts. and in 1092 1,51,592 cwts. at the values of Rs. 23,787 and Rs. 26,531 respectively.

The above figures relate to the whole of South Travancore, but since the majority of the jaggery is collected at Nagercoil at the depot it is mentioned here. The work of the depot consists in allowing the jaggery and molasses to separate and the liquors are allowed to run off into a pit which is made in the centre of the floor. The remainder, after the straining is complete, is refined and made into sugar. It has been suggested that a most economical method would be for the sugar to be distilled from the jaggery first and the waste products utilised in the Nagercoil distillery for production of alcohol. This process is not difficult and consists chiefly in the use of a vacuum pan. This idea is one worthy of consideration and is quite possible in practical working. The cost of such a factory would be Rs. 30,000 to 40,000. With the working capital necessary it would require a total capital of Rs. 50,000, for a company to work successfully and compete on the present market. The two essentials, however, are a sure supply of raw materials and increased production.

Arrack distillation from Jaggery.—Jaggery finds another use in commerce, and that is the production of alcohol. The different sugars contained in it undergo fermentation under suitable conditions, and alcohol is produced. As jaggery contains a very large proportion of these sugars much alcohol can be produced from it. Alcohol is a valuable substance, and is consumed in large quantities in every country.

Government has now erected a well-equipped distillery at Nagercoil. The fermentation system is capable of turning out 4,000 gallons of arrack per day from the 40 vats installed. The continuous still installed can turn out 400 gallons of spirit a day and is capable of rendering it 60 % above proof. There are also two pot stills installed. In the old factory the work is done entirely by two pot stills and it is said that the flavour of the rum from the pot stills is good. This being so, the pot stills could still be used for rum, and the other still can profitably be employed in the manufacture of alcohol when not required otherwise.

The possibility of distilling a cheap motor spirit from jaggery has been suggested and it is worth experimenting

upon. Its practical working is amply demonstrated by the experiments conducted in Hyderabad with alcohol distilled from Mahua Flowers. Their experiments showed that all kinds of Motor Vehicles could be run on this spirit and the cost would be only half that of petrol in pre-war times. There are certain minor objections but a little experimental research would remove these. For this purpose it would be necessary to distil alcohol in the continuous still two or three times and then render it undrinkable by the addition of something, which would in no way detract from its value as a motive power. A cheaper motor spirit would mean everything to our Travancore Industries and its development would solve some of our greatest problems, that is of power and fuel.

In Hyderabad a special distillery is being erected for the purpose of alcohol distillation to be used as a fuel for motive power. We in Travancore might adapt our still for this purpose. Government has already passed orders that the alcohol from the Nagercoil distillery should be experimented upon by this Department with a view to finding out its properties as a motor fuel.

Fermented toddy.—In this taluk there are over 3850 trees tapped annually for fermented toddy, and this has been practically a steady figure in the last few years.

Palmyra fibre.—Large quantities of fibre are extracted annually from the leaf fronds of the palmyra trees. In 1092, 1336 cwts. of fibre were exported from South Travancore, in the raw condition, and 15,424 cwts. of manufactured fibre were also exported. The total value was Rs. 226,708. The fibre is exported mainly for the manufacture of brushes, and the question of starting the industry, here, has been taken up. It could easily be developed as a cottage industry and schools of instruction and depots should be established to instruct and organise it. Whisk brooms, scrubbing brushes, pan brushes, cloths brushes and ordinary brooms can be made and sold both locally and abroad. The depots should be the intermediary agency with the markets. It will be necessary to employ local carpenters to make the wooden backs, and then the rest can be done in the homes of the people. A large number of people can thus be helped. The tools required are few and inexpensive, and it would be a good thing if each pupil of the school be given a set of his own. They can all be made locally. In this way people will be

enabled and encouraged to take up the industry. A set of tools and Rs. 20 would be ample to start this as a home industry. While under training, scholarships might be given to the poorest classes for their maintenance. Above all, the schools and depots should be worked in close contact with the business-world, and should therefore be carefully guided by the Industries Department in matters affecting the prices and markets. The co-operation of the South Travancore fibre-business-firms is assured for the enterprise. It should be noted, however, that the annual production of fibre is not sufficient to supply the present demands in normal times, and consequently steps must be taken now to establish a sure and constant supply of the raw-material. A large manufacturing and fibre exporting firm informed me that there was a big shortage in the production of fibre in Travancore and that, if this went on, they would have to bring fibre to Colachel in native craft from Tuticorin in order to keep their factory working. At present there are over 1500 people in the factories in Colachel alone, not to mention the numerous climbers and others engaged in the industry.

Mat-weaving and basket-making.—Side by side with the fibre industry is worked the industry of mat-weaving and basket-making. The palmyra leaf is used to a large extent for this purpose. The mats made out of it are stronger than those made out of screwpine leaves, and are harder in texture. At present, Japan supplies India with baskets made out of palmyra leaf. Skilled basket-makers already exist in the State in the Northern taluks. These people could be used as instructors in South Travancore. This industry of basket-making should be properly taught and might be successfully introduced as a cottage industry, and with our low price and superior workmanship we can gain the market without any trouble. Recently nearly 10,00,000 square feet of these mats have been exported from South Travancore for war purposes. The mats are usually made in size 4 ft. by 4 ft. and 6 or 7 ft. by 3 or 3½ ft. The industry at present is not properly organised and has great opportunities before it. In this taluk the cottage workers are numerous. The industry is carried on by the poorest people and Rs. 4 to Rs. 5 can be earned by a woman who is a good worker. New designs, small cases, baskets, etc., would find a ready sale in outside markets, but there is no opportunity given for instruction in these patterns, or for collection of goods for the market at present. A depot will

be a great boon and should be for instruction in new patterns as well as for collection of finished products and subsequent disposal of goods. The demand exists in India today and we have already had enquiries for large orders. More can be done if the cottage workers are organised.

From the foregoing it can be seen that there is ample scope for improvement and development in the industries connected with palmyra. Since the raw material is cheap and abundant locally it will be comparatively an easy matter to work up the points mentioned. A recent discovery has also given a further use for the leaf of the palmyra. It can be easily made into match boxes, and is peculiarly suitable for this purpose. It is thin and smooth, easily cut to shape and strong, and thus any planing machine is unnecessary for its preparation, previous to the manufacture of the boxes. It is hoped that before long a firm will open out in South Travancore for this purpose. Little more can be said about the palmyra industry in this taluk, but the above remarks can also be applied to the other taluks of the Southern Division.

Cotton.—The most southerly pakuthies, *i. e.* those of Agasteeswaram, Parakkai, Kanniyakumari, and Tengampudur, were formerly large cotton-growing areas, and the decline in the cultivation is entirely due to the conversion of the cotton land into paddy fields, since the water was brought down under the Kothayar Irrigation Scheme. Nevertheless there is an interesting survival of the cotton industry and many acres are still under cultivation near the Cape. The cotton is cleaned, ginned and finally spun into yarn in the cottages of the people. A brief description of the methods employed will be of interest. The first part of the process consists in passing the seed pods between two wooden rollers 9" long and about 2" in diameter. These are arranged with two screws so that on turning a handle the rollers rotate in opposite directions. The diameter of the rollers varies from $1\frac{1}{4}$ to $1\frac{1}{2}$ inches. The seeds are first expelled to the rear as they are too big to pass between the rollers and the cotton is taken out on the other side. The second part of the process consists in teasing out the cotton and this is done with a bow arrangement consisting of a thin bamboo with gut string tightly stretched between the ends. A kind of dumb-bell arrangement 2" long and with the diner ends 1" in diameter is used as a plectrum to pluck the string. When it is plucked vibration commences, and if the cotton

is dry the vibrations serve to work it up into a soft and fluffy mass. The third part of the process is to take this shaken-out-cotton and roll it loosely by hand round a thick cane. The next thing that is done is that it is spun into yarn on an ordinary spinning machine worked by hand. Finally this is wound into bobbins, and is taken to the local markets for sale or is used locally for net-making. Particularly in Kanniyakumari amongst the fisherfolk there is a large industry which is declining, namely, net-making. The method is very interesting and the work is done on a board which has a vertical plane about 9 inches high. The needle used for netting is of iron and is about 5 inches long. The two ends are both loops and the cotton is passed through the mesh in both directions alternately. The netting cost about 4 Chs. for each yard in cotton alone, and when they are finished they are exported to other parts of the coast. The nets are of small mesh and also entirely of cotton. For fishing purposes they are attached to the larger coir nets and are used for catching the small white bait fish which abounds at certain seasons. These net-makers carry on the industry entirely on a cottage basis, and the small fish caught in the nets are also dried by the same people. With a little tuition these people could easily be taught to make badminton and tennis nets and also to carry on their net-making on a better scale. At the present time the greater portion of the profit is taken by the middle man who exports the goods and if a depot for cottage industries took this matter in hand it could be successful. One of the greatest troubles, however, is the fact that the supply of local cotton is only very limited and there is little opportunity in the immediate vicinity for enhancing it. However, it might be possible to import yarn of the required thickness and also to cultivate cotton near the Tovala hills. The cotton industry is mainly carried on by women as cottage industry and lace-making and embroidery are fast replacing it. It seems a pity that it should be so, for the net-makers are skilled workmen in their particular craft, and if it could be reorganised and raw materials plentifully supplied, it would be a good thing.

Indigo.—Formerly indigo cultivation was carried on largely around Nagercoil and Kottar, and in common with many other places this has now died out. Last year an experiment was made both at Vadaserry and near the Cape to revive indigo cultivation and Government made a small

grant for this purpose. The indigo grew well and the leaves found a ready sale even without the extraction of the dye. The local methods of extraction were very crude and unscientific. The dried leaves were taken and were soaked for 24 hours. The resulting liquor was then decanted into a large earthenware chattie and churned by stirring with twigs attached to a long pole. A little lime was also added to precipitate the dye. It was then allowed to stand for 12 hours, and, next day, was strained through a cloth and sun dried. The resulting mass was pressed into cakes and sold for dyeing. As can only be expected, this product was very impure and absolutely useless on the open market. Owing to the shortage for dye it was bought and used. It has now been demonstrated that natural indigo, if separated by a highly scientific process and the exercise of due care and cleanliness, can be as good as the synthetic product, and that, if indigo cultivation is to succeed in South Travancore, the extraction must be done properly. At present, it is beyond the means of the local dyers and unless a large area can be cultivated, plenty of capital collected, and highly scientific men employed, it would be better to leave it alone since the competition with synthetic dyes will be a keen one. Vadaserry, Kanniyakumari, Kottar, and Suchindrum are all pakuthies where indigo will grow well. At present the extent of the cultivation is less than 50 acres.

Fruits and fruit-preserving.—South Travancore is a good fruit-growing country and plantains and mango trees are found in abundance. Besides this, grapes are also grown. It would be a good thing here to take up the question of fruit farming and preservation on a large scale as a proper business. It will be useless to do it otherwise, for, unless a good supply, and a surer one, of the raw material is obtained, the factory could not depend on outside supplies. If a sugar-refinery was set up to extract the sugar from jaggery it would be an easy matter to obtain cheap supplies for fruit-preservation. This industry is one which could be peculiarly successful in this district.

Other products.—Pine-apples, tamarind, jack, gram, peas and vegetables are grown for local consumption.

Trees and timber.—Mango, Laurel, Portia, Margosa, and Karivelam. The laurel leaves are largely used to provide leaf manure and Karivelam is used for splitting up into small sticks. It could probably be used for matches.

Minerals.

Alkaline deposit.—At Tengampudur there is an alkaline deposit which extends also to Suchindrum and is comparatively near the surface. It is not worked at all. Bulletin No. 5 of this Department gives the fullest details.

Plumbago.—There is a deposit of plumbago of excellent quality near Arumanallur and this is to be prospected in the near future.

Other deposits of this mineral are found in various places in the taluk, in some cases at great depth.

Alkali.—There is a deposit of Alkaline earth at Vellamadam three miles from Nagercoil on the Tinnevely road.

Monazite.—All along the coast there are deposits of monazite in small quantities. It is said that 20 tons per month were once extracted from the shore near Cape Comorin. Better deposits are found further up the coast.

Garnet sand.—At Cape Comorin, there are large quantities of Garnet sand found on the shore. This, formerly, had a commercial value and quantities were exported to Tinnevely. It can be made into grinding wheels, etc. There is still a market for the mineral, but the war temporarily closed the export trade.

Limestone.—There are good deposits of limestone near Cape Comorin and also lime shells in abundance. Lime burning is done largely in the Agasteeswarm pakuthy. Sea shells are used mainly for this purpose. Limestone occurs at Paracherivilay.

Iron ore.—The hills near the Cape and all round Suchindrum also on the way to Bhuthapandy at various places Iron ore is found in quantity. It is mainly Haematite and in any cases is cleverly marked. Reports from local people stated that Galena had been found, but this proved to be Haematite. There is a large quantity of the ore in the hills. At Marunkur, formerly, the iron from the district was smelted and the local blacksmiths used nothing else for their work. Evidences of this are still to be found. There is no doubt that plenty exists in the hills, but it has not been prospected. The local extraction of iron from the ore is now defunct.

Existing Industries.

Agriculture.—This is one of the main Industries in the taluk and the Majority of people are connected with it. There has been a great change in the produce of the district, consequent on the opening of the irrigation channels. Formerly palmyra and cotton were the main crops, but now both of these have been replaced by paddy. Tapioca is not cultivated to any great extent. Cholan cultivation is declining. There are about 13,670 acres of paddy land, and the greater part of this is double cropped. It can be said that over 30,000 people are dependent on agriculture for a calling, and are skilled agricultural workers. Many of these are landowners also. The average income of the cultivator varies greatly in the different pakuthies, and it was stated that 300 rupees to 500 rupees were the two limits for the ordinary person. This represents the annual income of the small man. Coolie wages are not high. Recruiting for estates is largely carried on in the district, and this renders coolie labour scarcer. However there are plenty of agricultural labourers. An ordinary coolie gets 2 fanams or 8 chuckrams per day. In some cases 10 chs. are earned. A woman labourer gets 5 chuckrams per day, and in this way many of them add to the family income. A small boy works also and gets from 3 chuckrams per day. They can usually get work for 24 days per month. A minimum of 5 chuckrams per day has to be spent for food, and the general run is that the labourer has to spend all his daily earnings to get necessities of life. Rental is not charged in the country areas, but services are rendered instead to the owner. A cultivator who is single has to spend about 12 rupees per mensem or between 60 and 70 rupees every six months for his living expenses and a family costs about 30 to 40 rupees. The debts of the small landlords and cultivators are largely met by chitties. This is quite a frequent procedure amongst the people of this district. As regards implements, the local workmen are skilled and able to do most of the work, but the majority of the better goods are imported from Tinnevely.

Weaving.—This taluk contains the largest weaving communities in the State. They can be roughly divided into classes according to their homes. Vadaseri and Kottar are the two main places. At Vadaseri the Chaliyas are the weaving community, whilst at Kottar the Mohomedans are also in great numbers. A few notes on each are appended.

Vadaseri.—In Vadaseri alone there are over 700 looms, and these are practically all used by the Chaliya community. The original Chalyars lived in Devagiri town in the Maharashtra country. In the course of time some of them migrated to Conjivaram, Kuranadu, Courtallum and Sami-Malai and from thence they went to Puthnapuram, Tinnevely and neighbourhood. Those that went to the former place went on to Bhuthapandi and neighbourhood and thence to Vadasaimapuram which is the Vadasery of today. The present weavers are the descendants of these people. The original people settled down there nearly 300 years ago. It is not known definitely when they started weaving but it is stated in their puranas that the weaving industry was begun by the original ancestor of their race the Chaliah Rishi. The number of skilled weavers in the Vadaseri community is about 700 and the hours of working vary from 10 to 11 hours per day when business is brisk. The daily wages of a workman vary from As. 4 to As. 8 according to skill. Lace-cloths, Mundus and the finer kinds of cloth are all woven. Silk yarn is imported from Madura and Kumbakonam for working purposes and the gold and silver lace thread from Madras. Formerly, the latter was locally made, but this has died out. The annual production of this community was valued at Rs. 70,000 in former times, but now, it is much reduced. There is no record to show that any service, Inam tenure or other tenures, were conferred by His Highness the Maha Raja on the Chalyas. Their ancestors used to supply "Kodippadam", Kodikayara, and other articles of worship to the temples at Buthapandy and Suchindram, and certain articles to His Highness. The Shuttle loom is the only improvement thus far introduced in the method of weaving. Horns and dealwood were used on the old looms, but wood is used for the flyshuttles used on the new ones. The average monthly wages of a weaver vary from Rs. 8 to Rs. 15 according to skill and diligence, but the higher figure is only obtained by continuous work and Rs. 11 is a fair figure to quote as the average. Most of the weavers work it as a cottage industry, and, as such, they own their looms and work independently. They usually have other interests such as land, and they invest most of their money in landed property. The consequence is that their weaving has become of secondary importance in many cases, and there has been a deterioration in the class of workmen and the industry suffered generally. Agriculture is also the great concern of the wealthier members of the community. The

locking up in land of the money earned has been a great factor in the decline of the industry, for it has left no capital free for the development of the calling. There are large cloth merchants in Vadaseri who collect the finished cloths and finance the industry. They are also yarn merchants and bankers. It is a pity that these men do not finance improvements, but good rates of interest are secured for loans and their landed property is considered a safer investment than a weaving factory. The best brains of the community are now in other professions of a less arduous and more profitable nature. The causes of decline are dealt with later.

Weaving.—Kottar.—There is a large community of weavers in Kottar. About 50 families of weavers are in active work in the pakuthy. Their conditions are practically the same as at Vadaseri and their wages, etc., identical. They weave all kinds of cloth including the finer lace cloths. The yarn is bought locally from merchants who import it from various places. The Mohamedan branch of the community was formerly weavers of silk cloths, and for this purpose silk was cultivated in former times, but is now defunct. The present supplies are all imported. The Kottar people formerly made lace-cloths from local materials and Bulletin No. 13 of this Department shows the full extent of this industry in former times. Apparently it was first introduced into Travancore by certain Mahomedan emigrants who came three generations ago from the State of Baroda. Several families settled in Madura and still carry their business, whilst those who came to Kottar and Nanjinad carried on the Industry for a short time and then failed through lack of capital. Their poverty was the immediate cause of their having been unable to buy machines to make the thread in an improved and quicker fashion so as to compete with the European thread that was flooding the Indian market. The result is that today the descendants of the original families are paupers and live in penury. They are skilled workmen in this craft and they live by the occasional work which they get. The district around Kottar was at one time a centre of silk production and this is an essential for the success of the lace thread industry. The silk reeling industry flourished in the cottages, and utilised the local silk. In this way the body of inner thread for silver and gold thread weaving was cheap and available at home. Owing, however, to foreign competition and lack of capital the people began to reel silk and make the yarn from raw materials purchased elsewhere.

Thus Sericulture and Mulberry-growing died out. The few families now remaining still carry on their work, but have turned their attention more to making of silver and gold lace from the thread. Thus the industry is almost extinct. The first part of the process is that of dyeing the silk yarn and this they accomplish in various colours by indigenous dyestuffs in the absence of aniline dyes formerly used. An excellent yellow colour was obtained with materials imported from Kumbakonam, costing Rs. 2 to Rs. 2/8 per inviz. The silver and gold tinsel is drawn out by hand through the ordinary draw plate and the workers are expert in this work. The method is laborious and a machine is required for this process. The local thread is of good quality, and has distinct features. Foreign made thread is thinner and the gold is often adulterated with copper, which was actually detected by the Nitric acid test. Travancore thread is thicker and stronger and the gold used is pure. As a consequence of the above circumstances the Travancore thread is 50 per cent higher in price. Local weavers stated that it was of superior quality and that in consequence of its increased thickness, a shorter length was used to weave a border of three or four inches wide than when foreign thread was used. The cost in both cases was almost the same, but one fault of the local thread was the shrinkage when washed. The French supplies will be reduced for some time owing to the effects of the war and if close attention was paid the local supply could be firmly established in the meantime. The people can raise little capital amongst themselves even by co-operation and a small initial grant is necessary for the start on a proper basis. The total capital required would be Rs. 1500 to include purchase of machinery, working capital, etc. The market is assured and if suitable organisation is founded and capable management exercised it would succeed again. Proper machines, capital and control are the essentials. The weavers here are known as Mudubar's and came from Cape Comorin comparatively recently.

Nagercoil.—In Nagercoil there are several weaving institutions one of which is under Government control. A few notes on these are appended.

Government Weaving School.—The building in which this school is situated is a rented one, and is hardly suitable for the purpose. The back premises are temporary and leak in wet weather. It has been suggested that the disused Gaol premises would be better. The staff consists of 3 teachers.

including the head instructor and one clerk, and is under the supervision of the Assistant Inspector of Vernacular Schools. The work of the institution is far from efficient, taking as standpoint the effect and influence on local weaving. The staff are not head and shoulders above the local skilled weavers in skill or knowledge of the craft and hence are not regarded as a powerful influence for development of new ideas and methods. The pupils taught number 26 and are simply instructed in the ordinary methods of weaving which they could learn as efficiently at home on the local looms. The income from sales does not prove efficiency, and it is the influence on local weaving that really matters. The idea of the Institution should be to establish itself as an advisory centre for weaving and also an advance post in the weaving progress of the locality. It could well be reorganised as a Government Depot for instruction, etc., as outlined in the general report. (Vide general report).

This would prove the most efficient way of making the place supply a long felt want. It needs a broader outlook than at present. New patterns and markets for them, adaptations of existing looms to new requirements, etc., could all be worked out here and it could be a centre of Co-operative weaving enterprise for the sale of yarn and cloth.

A description of a typical weaving institute in Nagercoil will prove instructive as showing the causes of failure of the industry.

The works consisted of a roomy building in good repair and kept clean and tidy. 6 pit looms had been installed. The proprietor was a skilled weaver and had invested Rs. 5000 in the concern. Linen cloth, Lace cloth, etc., had all been woven and were exhibited. Every appliance was in order and it seemed extraordinary that the venture failed. The causes were investigated and found to be.

(1) No books were kept. The manager had no idea of the quantity of yarn used or of the expenditure on the same per month. The yarn was purchased as required from bazaar merchants and he paid a high price for the same. The market for his goods was not assured and he only knew that he took the finished articles to the bazaar and realised what he could. If he had a little money in hand he sold at higher prices but when in want of funds he had been often compelled to sell below cost price.

(2) The workmen were improperly paid. He had trouble with his labour. It was found that he had underpaid his men at the beginning with the idea of selling cheap articles to secure the market. The natural sequence was that the good workmen refused to work for him, inferior labour was engaged and inferior goods resulted. Thus his initial idea was his ruin. He had no notion of working to time or the value of time. This is a typical case of a man with capital who started in good style but had no idea of business. It is therefore essential for the revival of the industry that business-method, Book-keeping, records of income, expenditure, etc., must be taught to these people as well as the instruction in the newer methods of the craft.

Weaving.—Another example can be given as illustrating other causes for the decline of the industry. At Vadaseri five pit looms were working in a crowded building with little light and air. The sizing of the yarn was done in the Alley way outside. At Vadaseri the weavers live in streets and the long stretch outside the houses is used for stretching the yarn for sizing, etc. The weavers above mentioned had a stock of yarn worth thousands of rupces, but they entertained little hope of selling it. This stock was the product of years of labour and of excellent workmanship, but was out of date in pattern. The stock was examined and a selection of some of the cloths made to test their market value. One cloth marked Rs. 75 was sold for Rs. 15 only, and for goods worth Rs. 153 only Rs. 65 was realised. The conclusions to be arrived at were that the people did not know the value of their goods on the market and charged exorbitantly or that they were weaving goods for which the demand had ceased to exist. The whole of their stock was similarly out of date, and yet they were weaving more of the same variety. They took no intelligent interest in the changes of fashion or of popular demands. They were requested to try weaving other things that the market requires, and they replied requesting tuition and direction as to how to weave and where to get yarn. This is a case where an up-to-date local institute with a properly qualified staff and equipment could step in and help materially. Their market was entirely local and they had no idea of weaving for other places, even in Travancore. What they required was that if they did any work for export the goods would be bought and paid for at their door and taken away by some other person. Business enterprise was entirely lacking and they trusted

nobody. The past profits of the business had been invested in a land purchase with the result that the weavers were almost independent of their craft and had lost the idea of making it pay. As long as a steady income was being derived from their landed property they could work when they pleased, sell when they pleased, and they were unreliable in consequence. Another family near was also typical. One son was a motor driver, one was in Government service as a clerk, another was a teacher and others were at school. Education had opened out new careers to these men and the fruits of the labours in weaving of the parents and predecessors had provided them with funds to socially improve themselves and leave their old calling. Not one of them had the least idea to follow weaving as an improved and scientific career and the different callings they had taken up seemed to afford a greater security in life. These were highly intelligent men and they could have been influenced to make weaving a high art and paying concern if the educational training they received had assisted them to do so. The causes of decline of the weaving industry can now be summarised.

(1) *Foreign Competition*—The influx of cheap Manchester and Japanese articles, these goods were made by power looms on a large scale, and, in consequence, they were able to undersell the hand-made article. Then too, the yarn is spun in Manchester and district and the imported yarn for the weavers was of the same origin in most cases. The finished cloth was less freight than the yarn, and in consequence the foreign goods were much cheaper. They were more plentiful also.

(2) *The change in the demand*.—There has been a great change in weaving with the introduction of the fly-shuttle, but the weavers are not up to date in their methods yet. The style of Indian dress has changed greatly in recent years. Twills for shirts and hollands for coats, etc., are required rather than the older forms of attire. The old weavers were catering for a different market and it is useless to turn out the quantities of the old style cloths now. So long as the local weavers remain in ignorance of the methods of manufacture of the market demands and also of the demands themselves it cannot be wondered that foreign goods come in to catch the market.

(3) *Lack of Business capacity*.—The majority of the working weavers are unbusinesslike and poor. They are in

the hands of the middlemen and merchants from whom they take advances against labour at high rates of interest and also they are in ignorance of anything better. A co-operative society would help, but, initially they do not understand co-operation, and they cannot free themselves off their obligation to the money lenders, and so, unless they are educated up to it, the society would not be very useful. Careful supervision is necessary at first and also an initial grant. A class for elementary book-keeping and business method would be of advantage, to be taught along with the vocational instruction.

(4) When the weavers first settled in this district there was plenty of local cotton grown and plenty of local yarn available. The transformation of the cotton area into paddy land cut off this source of supply and the weavers became dependent on outside. The yarn has to be imported and this means additional cost. This is also a cause of the decline.

(5) The above are all partial explanations but the root of the whole matter lies in the cheaper method and greater efficiency of the power loom. For the ordinary articles of attire, mull, twill, etc., which are in universal demand in large quantity the power loom can turn out the goods at a quicker and cheaper rate. The quantity produced cheapens the cost of production. The local fashions can well be catered for by the looms worked by hand, and, since distinct peculiarities of dress are found in different local areas, it is for these that the weaver can make goods; for it is not worth while to work a power loom for a small local demand. The local weaver has a good future in catering for a local market, but the power loom is better for the goods that are universally worn and for which the demand is great everywhere. Nariethus of particular types, etc., Rough cloths for local wear, can all be sold in plenty. It is to these demands that the weavers' attention should be turned, and he must be instructed to turn out what the people want and in the location of the market for his goods.

In conclusion, the weavers have still a future before them if they are properly guided and taught. Handkerchiefs, Nariethus, Towels, etc., can all be woven with advantage and it is only the precise patterns that are wanted to make the goods marketable.

There are also individual weavers scattered throughout the taluk in other places besides in the two main communities.

At Agasteeswaram there are 10 families of weavers, and others are found making cloths to meet local demands throughout the taluk. It must be recognised that the industry can be divided under two heads, namely, Factory and cottage weaving. The power loom is the best for the factory and turns out large quantities of cloth of universal demand, whilst the hand loom is for the other and turns out the goods of local demand. There is ample room and scope for both if the latter is organised as well as the former. The census of yarn taken on 1st Kanni 1094 showed that there were 22 merchants in the Agasteeswaram taluk and the total value of their stocks exceeded Rs. 1 Lakh. This will give some idea of the importance of weaving in the Taluk when even in time of shortage such stocks are held. Besides the above it should be mentioned that another factor in the decline of weaving has been the decline of hand spinning of cotton yarn. This naturally ceased when cotton cultivation declined and died out. The only power spinning mill in Travancore is closed and is some distance from the cotton districts and weaving centres.

Dyeing.—In both Vadaserry and Kottar dyers who dye the yarn for coloured cloths formerly existed in large numbers. The yarn is now imported already dyed, and further the methods of the dyers are very primitive. The result is that they produce colours of inferior brightness and inequality of shades. The dyeing is done as a cottage industry and for the most part in local earthen-ware pots. The methods employed are unscientific and also lack cleanliness and precision. The decline of the industry is due to the fact that whilst dyestuffs have changed and synthetic dyes have replaced indigenous ones, yet methods have not been altered to suit the new materials in use. The question of the re-organisation of the dyeing industry is an important one and what is first required is instruction in the modern art of dyeing. Government have recognised the importance of this by sending Mr. Padmanabha Pillai to England to study the subject and it is hoped that when he returns he will be able to introduce the new methods and develop the indigenous dyestuffs which abound in this State. With regard to the latter our bulletin No. 1 indicates the extent to which this research is necessary and can be promoted. The economic value of these dyestuffs is practically unknown, but indigo and sappan are found in the district in plenty. Government, last year, conducted an experiment in indigo cultivation and

this was successful from many points of view. It proved the possibility of growing good indigo in the south of the State and also that a good price could be obtained for it. The local methods of extraction, however, was very crude and in consequence it was found better to sell the leaves than to extract the dye from them. The method of extraction used locally consisted in soaking the dry leaves over night in water. The next morning the leaves are strained off and the liquor was mixed with lime-water. The resulting mixture was churned by twigs and the froth was removed. It was then allowed to stand over night and indigo was precipitated to the bottom. Next morning the sticky mass was shaped into cakes and sun dried. The indigo cakes thus produced found a sale because of the scarcity on the market of synthetic dyes but they were very impure and contained much dirt. This method of extraction has only one virtue, and that is its cheapness. However, taking into account the pure synthetic dyes on the market, it is essential that the natural variety should be produced on an equally scientific scale and with equal guarantee of purity, otherwise it will be useless to attempt competition. The weavers are badly in need of funds to purchase new utensils for their work but above all they need proper instruction and supervision in modern dyeing.

Lace-making.—Lace and Embroidery are carried on as cottage industries throughout the taluk under the supervision of the various Missionary Organisations who are working there. The London Missionary Society established the first lace school in Nagercoil in 1823, 96 years ago, and to-day, there are many other organisations working in the same way. A brief survey of the various pakuthies will be best to show the extent of the industry.

Nagercoil.—The London Missionary Society has over 1,200 workers on its books, though only a few of these devote their whole time to their work. A notable feature is that every woman worker to this agency is able to read. Social elevation plays a most prominent part in the work. The market for the goods is not sought for by advertisement but simply amongst the friends of the mission and people who have personal recommendation from others. The wages earned by women vary considerably from Re. 1 to Rs. 5 or Rs. 7—per mensem. The industry is perpetuated by means of a lace school which is composed of children who, as a rule, board in the girls' home attached to the society's church.

They receive, in addition when proficient, tuition in the lace industry, and leave with a definite calling in their hands to be used as a means of subsistence or to add to the family income by home industry. The girls are drawn from Nagercoil and district around it and number some 31. Two women teachers are employed on Rs. 8 per mensem. They hold the Elementary School Leaving Certificate and have a knowledge of pillow lace making. The school is under the able supervision of Miss. B. J. Duthie and it is to her organisation and ability the success of the project is due. Half the day is spent in general education and the other half in instruction in lace making. Government gives a grant of Rs. 12 per mensem for this school and this is about 50 % of the tuition fees. If however, the boarding of the pupils is considered, the grant is one-tenth of the total expenditure. No fees could be charged as the pupils are all orphans and very poor. The training is for about 2 years and begins only after class I is passed. The girls then find employment through the industrial work of the society.

ST. JOSEPH'S SCHOOL, NAGERCOIL.

This school is under the supervision of The Rev. Mother. of St. Joseph's convent. The pupils are local children from Kottar, Nagercoil etc. 85 pupils and three teachers make up the strength of the institution, and sewing and embroidery are the main subjects taught. The staff has been technically trained in Belgium for this work. Government gives a grant in aid which equals about $\frac{1}{4}$ of the expenditure for the upkeep of the institution. The course extends from 3 to 5 years according to the ability and standard of the pupil. No fees are charged as the people are too poor. The pupils are all of the general educational standard of the 3rd class in a Vernacular school and the poverty of the girls makes them anxious to earn money, and further education is difficult. In Nagercoil alone there are now 60 women, all ex-pupils working at home on this industry.

SALVATION ARMY SCHOOL.

At Vadaseri the Salvation Army have a lace and sewing school with about 500 women in employment. They also are encouraging knitting by machine as a cottage industry. The lace, etc., is sold in India by travelling agents of the mission.

PRIVATE ENTERPRISE.

Mrs. Allen, late of the L. M. S. has an industrial concern for lace and embroidery which is organised by her apart from the machine. Many women are kept in employment.

Agasteeswaram.—The lace industry is thriving throughout the pakuthy and the women, in almost every home, are working. Over 350 women are so employed. The business is well & properly organised here under Miss Cox. She has a proper depot and catalogues of patterns, etc., and the business part is well managed. The average woman gets Rs. 3 per mensem for spare time employment.

Lace and Embroidery.—*Kaniakumari.*—The Mary Immaculate School, Cape Comorin.

This school is an offshoot of the Mulugumudu Orphanage and is under the direction of the Roman Catholic Sisters. At present the pupils number over 180 and the staff consists of 6 teachers. The girls are drawn from the families of the fisher folk of Kaniakumari and Kovelam villages. The upper classes have teachers with special Belgian Technical Training. Government aid the institution to the extent of $\frac{1}{3}$ of the total expenses. The course takes from 3 to 5 years, and the tuition is free as the pupils are too poor. The standard of general education is that of the 3rd class. The first venture here met with real prejudice amongst the people, but now the pupils are coming in large numbers. In the first few years at least 8 families have adopted this as a cottage industry for their women folk.

Tengampudur and Parakka.—Above 1000 Christian women in these pakuthies are making lace. This is a thriving industry in the cottages of the people. The average income derived is Rs. 3 per mensem for leisure time employment. They are attached to the L. M. S. Nagercoil and to Mrs. Allen.

Tamarakulam.—About 500 women are engaged in this work in this pakuthy. They are attached to the Nagercoil L. M. S.

Terur.—The L. M. S. have about 100 women working in Terur pakuthy.

It is thus seen that as a cottage industry lacemaking and embroidery are of great importance in this Taluk. Bulletin No. 3 of this Department has dealt fully with the future of the industry and offered suggestions as to how it can be developed.

Salt Manufacture.—Thamarakulam and district is the most important salt producing area in the State and one from which Government derive revenue. The manufacture of salt is under the guidance and supervision of the Excise Department and gives some idea of its extent. One should perhaps quote a few facts from the various department reports of 1092. "Manufacture of salt was carried on in Thamarakulam, Rajakkamangalam, and Colachel and in Mr. Sankaramurthi Pillai's factories. There are 9 salt factories. License was granted for the manufacture of salt in 704 pans in Mr. Karayalar's factory. The total extent of land fit for manufacture in all the salt factories was 327.02 acres in 1092, and 324.06 acres in 1091. The total quantity of salt manufactured during the year in all the salt factories was 4,83,843 maunds in 1092, and 4,31,091 maunds in 1091. Of this quantity 15,448-maunds were at Colachel. Including excesses credited from heaps sold out, the total out-turn during the year was 5,93,543 maunds. The average yield per acre was 1974.98 maunds in 1092. The out-turn per acre was largest in Avathanial's Factory *e. g.* 3715.66 maunds.

In view to afford protection to the completed factories and as a precaution against the danger of a large and sudden reduction of the water-holding-capacity of the Manakudy lake, Government have adopted the policy of making grants of land for salt culture in such manner that one grant might be worked out into a factory before another plot was assigned for a similar purpose. The area available for conversion into factories being small, the above precaution was necessary. The work of reclaiming lands for salt manufacture could not therefore be pushed on vigorously. Mr. Karayalar's factory is expected to yield an additional lakh of maunds. The quantity expended in 1092 is 5,50,833 maunds.

In 1092, 704 pans were rendered ready for manufacture in Mr. Karayalar's factory and a license was issued for manufacturing salt in these pans. Another 5000 pans have also been completed and are expected to be ready for manufacture.

In 1092 a total quantity of 2,95,881 maunds 10 seers of salt was imported into the depots at Munambom, Alleppey, Quilon and Trivandrum from Bombay.

The total quantity of salt produced in the Tinnevely district and consumed in the State in 1092 amounted to 1,09,570 Mds. & 16 Srs."

From the foregoing report it can be seen that Travancore has not yet reached a state of independence in the matter of this industry although attempts are being made to enlarge the production greatly. In America a method has been employed of allowing the brine to trickle down high towers exposed to wind and sun and closely packed with twigs. This method does not involve large areas of salt pans. Besides the enhancing of the output of salt, there are many other valuable products that can be obtained from the brine, the Castner Kellner process of Electrolyzing the brine to produce caustic soda and bleach. The former is essential for the soap industry and also for many other processes, and having in view the possibilities of soap manufacture in Travancore it would be of great advantage if we could produce soda locally. The great necessity in this direction is power and in common with other industries the question of power supply is a most serious question in Travancore. Recent work on the production of salt and recent criticisms show that the method of manufacture in use are more or less traditional and are handed down unchanged from year to year. They have largely remained uninfluenced by the developments of modern science and also no real scientific investigation into salt making methods has been attempted in Travancore. Purity of the salt and the size of crystals could all be improved and presence of valuable by products eliminated. Magnesium chloride is one of the chief of these and together with the potassium salts and combinations with bromine and chlorine very valuable chemicals could be extracted from the tons of waste liquor after the salt crystals have separated out. Quantities of magnesium sulphate could also be obtained. When one considers the importance of potash manures and also of chlorine and bromine in agriculture and chemical industry it is obvious that these valuable products should not be wasted. It is said that 5 per cent of bromine is found in the concentrated liquor and it is highly probable this is the case. Some recent investigations on the subject of bromine production have been carried out by this Department in the last year. From Colachel to Cape Comorin a kind of sea-weed is found growing on the rocks and after burning, the ash was examined and found on analysis to contain 21.4 per cent of bromine. This is quite a high

percentage and the rocks are covered with the weed, so that a fair quantity could be obtained. In relation to the original weed the tests show that about 0.75 per cent of the original weight is bromine. From the foregoing it is seen that there is ample scope for scientific research and development of the salt industry and such work would undoubtedly be profitable.

Fishery.—From Cape Comorin right away up to Dharmapuram fishermen are found in large numbers. A brief survey of the various pakuthies will be of interest :

Kanniyakumari.—Practically 70% of the population both at Cape Comorin and Kovilam are engaged in the fishing industry. The fish are only caught in quantity at certain seasons, and at the proper time fish worth thousands of rupees are caught in a single day. The fisherfolks are extremely poor and they live close to the shore in private huts. Their surroundings are most insanitary and the drying of fish immediately outside their house creates an atmosphere which cannot be described in words. The chief fish caught are the small white bait which are dried for export and also the larger fishes such as sear, in the proper seasons. These are exported to the neighbouring markets but a large quantity is dried in the sun and sent to places in British India. The local Roman Catholic Church takes one day's catch per week. The method of drying fish is very primitive and consists in simply putting it out in the sun on palmyra mats. The fish caught in monsoon time is buried in pits so that after decaying they are used as fish manure. The opening of a fish manure pit is an event which is best left to the imagination as the smell therefrom is very bad. Considerable export to Ceylon and other places of this manure is done in normal times.

Tengampudur and Parakkai.—There are about 2000 fishermen living on the coast in these pakuthies. Their economic condition is very unsatisfactory and whilst at certain seasons they have plenty, at other times they starve. It is said that on occasions over Rs. 1000 worth of fish is caught in a single day.

Dharmapuram.—There are large numbers of fishermen here and their economic condition also is very poor. It can be said their monthly earnings are between Rs. 3 and Rs. 4 and if one includes the cost of the fish consumed by them then it comes to between Rs. 4 and Rs. 5. The average

family contains 4 or five persons, many of these work as well as the fishermen on net making, coolie work, etc., and thus add to the family income. Certain of the women take up lace making as already mentioned.

Tiles and pottery.—There is one good pottery in the taluk and a few other smaller ones scattered about. The chief difficulty is the lack of skilled labour. At Tengampudur, pottery work has ceased although at one time good pottery was made. The other pottery work is still in full work, and provides the cooking utensils of the taluk. The average earning of the workmen is about 8 As. a day, and at Suchindrum Pakuthy 15 families follow this calling.

Copper and Brass Work—In Kottar, there are large numbers of copper and brass workers who work to supply purely local needs. The brass used by them is obtained locally from old utensils and they make articles for local use and of local design.

Printing.—There are two presses of a character able to turn out good work i. e., 'The Travancore Times' Press which publishes a weekly newspaper and the London Mission Press for general printing which does excellent work. There are three other presses catering for local requirements but it can be said that the L. M. S. and the Travancore Times have a wider scope and are noted for good work. About 30 people are employed in the various presses and the proprietors expressed their anxiety to obtain better work and to raise the standard of printing if encouragement could be given.

Oil-Pressing.—There are very large numbers of oil-bearing trees in the taluk and we find 191,000 pinnai trees alone. Oil-pressing is done in Vadaserry, Tamarakulam, Agasteswaram and Tengampudur. It is also carried on to a lesser extent in other pakuthies also. Laurel oil is extracted in all these places and in Thamarakulam Margosa seeds are also used. The laurel oil is exported to other parts of Travancore but the cocoanut oil produced is only used for local consumption.

Possible Industries.

It is difficult to suggest anything further than has already been dealt with in the above report but one or two other industries might be suggested.

Sericulture and Silk Reeling.—It is stated that this industry flourished in South Travancore in former times and it would seem a highly suitable place for its reintroduction as a cottage industry. If it is possible to produce the silk, there is plenty of demand for it locally for weaving purposes and it will be possible to build up a big industry on this foundation.

Button-Making.—Along the coast, shells of all kinds are found which are suitable for button-making. Shank shells for bangle-making are also found in quantity, and if this was organised as a cottage industry as in Bergal it would undoubtedly be a paying concern. The raw material is available locally and costs little. Instruction and organisation for collection of finished products is necessary and could be done from a cottage Industry depot.

Leafmanure, Fish Manure and Sea weed manure.—This taluk is full of possibilities regarding manure production. There is plenty of manure from laurel leaves and in the proper season there is plenty of big fish suitable for making fish manure. In Kanniyakumari, Tengampudur and Terur there is plenty of sea-weed which is rich in potash and bromine. The Excise Commissioner states that quantities of this weed have been exported from Travancore for manure and other purposes through the Aramboly Chowkey, but little use is made of it locally and nothing is known of what happens to it outside the State. The weed was burnt and on analysis showed that it contained 11.1% of alkaline carbonate and 21.4% of bromine. Orchela weed is also found in the pakuthy and this yields good orchil dye. The above percentages are relative to the weight of the ash.

Tannery.—In Nagercoil alone an average of 12 to 14 hides are available daily and are sold to dealers for export. The rate is cheap and the hides are in good condition. Recently a small company has been formed to take up the question of a tannery and if scientifically run it should succeed here.

Possible Industries.

Fruit Preserving and Fruit Farming.—These have already been mentioned and discussed.

Palmyra Industries.—Under this heading, jaggery and sugar production, fibre, basket-making, alcohol-production have all been fully discussed. Mat-weaving, basket-making,

match-box-making, etc., are all possible and could be developed. Indigo culture, cotton, mosquito-net making, weaving, dyeing can all be extended, and the many other points of the report such as by products of salt manufacture can be carried out. Cadjan-making for roofing purposes is carried out throughout the taluk and in Agasteeswaram Pakuthy alone there are 50 professional cadjan makers.

Foodstuffs available and used locally.—Rice, grams, salt, cocoanut, mango, tapioca, jaggery, fruits and vegetables, fish, plantains, peas, etc.

Economic Statistics.

There are a large number of skilled artisans of all crafts in the taluk and it can be said that fully 6,000 people are engaged in skilled work other than agriculture. Over 40,000 agricultural labourers are found but it is difficult to draw any strict line of demarcation between agriculture and other crafts as most people are interested in cultivation in some form or other. A rough division of the craftsmen is as follows :—

Name of craft.	No. of Workmen.	Daily wages.
Carpenters	470	4½ fanams per day.
Masons	350	10 to 12 As. per day.
Blacksmiths	70	Contract work. Generally about Re. 1 per day.
Weavers	1500 or more	Rs. 8 to 10 per mensem.
Fishermen	Some thousands	Rs. 4 to 5 per month.
Potters	50 or 40	As. 8 per diem.
Toddy climbers	about 1000 or even more.	Alternate days production.
Coolies	Some thousands	Man 8 Chuckrams, woman 5 chs. boy 3 chs.
Goldsmiths, Printers, traders	Large numbers	

Cost of living.—Cultivator's family. Between Rs. 30 and Rs. 40 per month.

Cooly's family. Between 6 Rs. and 7 Rs. per month.

Single person. (Middle class.) About Rs. 12 per month.

Number in family.—Cultivator. About 6 or 7 on the average.

Cooly. 4 or 5 persons.

Number of people qualified as voters. 50.

Number of professional people.—(Vakils, Officials etc.)—Some hundreds. This is the legal centre of the district and there are large numbers of Vakils, etc., in attendance at the courts. There is also a 2nd Grade College, and many schools, with their teachers, are situated in the taluk. It is also the centre of missionary effort and large numbers of people are attached to the administration of the various societies.

Co-operation.

Name of Society.	Working Capital.	Profit in 1992	Number of Members.
The Rudrapathivayagar Co-op. Cr. Society. (Agr.)...	Rs. 53	loss Rs. 4/15.	27
Thirunabbiyothu Co-op. Cr. Society	Rs. 1078.	loss Rs. 12/5.	40
Sri Moolam Muslim Do. Do.	...	Work not started.	...
Sri Chitra Thirunal Do. Do.	Rs. 1049	loss Rs. 5.	24
Nagercoil L. M. Employees Do. Do.	Rs. 735/10	Profit Rs. 41/6.	183

Joint Stock Companies.

Name of the Company.	Registered Office.	Capital
		Rs.
The Cape Comorin Transport Trading Co., Ltd.	Nagercoil	19,600
Nanjanaud Permanent Fund, Ltd.	Nagercoil	98,195
Travancore Jenopakara Vivaka Dhravya Sakaya Co., Ltd.	Oluganaserry	10,000
Travancore Thirukudumba Sakaya Kallyana Benefit Fund, Ltd.	Kottar	10,000
Krishni Abhivardhana Elachittu Co., Ltd.	Kalangadi	10,000
Indian Marriage Fund, Ltd.	Vadaserry	10,000
M. S. Nayagi Dhravia Sakaya Provident Fund, Ltd.	Kottar	15,000
Cape Comorin General Traffic Co., Ltd.	Kottar	5,00,000
Nanji Kerala Provident Fund, Ltd.	Nagercoil	15,000
Travancore Tirunabhi Jodhi Nithi Co., Ltd.	Kottar	5,000
Travancore Karunagara Kalyana Dhana Sakaya Co., Ltd.	Vadaserry	10,000
Travancore Tamilian Sangam	Nagercoil	50,000
Nagercoil Lekshmi Vilasom Motor Co. Ltd.	Nagercoil	50,000
Travancore Muhammadan Motor Co. Ltd.	Kottar	20,000
New Indian Motor & Rice Mill Co., Ltd.	Nagercoil	50,000
Auto Transport, Ltd.	Nagercoil	50,000
Cape Comorin Coast Trading Co., Ltd.	Kottar	20,000
Alagappapuram Thevaseervatha Dravya Sakaya Provident Fund, Ltd.	Alagappapuram	10,000
Arch Anthoniyar Dravya Sakaya Provident Fund, Ltd.	Alagappapuram	10,000
Pathukavalakaia Arch Anthoniyar Dravya Sakaya Kallyana Benefit Fund, Ltd.	Alagappapuram	15,000
Nanjanaud Mariyanayagi Dravya Sakaya Marana Provident Fund, Ltd.	Ramanpudur	15,000

Total fixed Capital, B. Rs. 8,66,568 Rupees.

11 companies, Members limited by Guarantee
10,500 members. Rs. 1,25,000.

Capital and Remarks.—The Co-operative Capital of the Taluk amounts to Rs. 2,115 and the Joint Stock Capital is as above. There seems to be a far greater inclination to invest money in Industrial enterprise than in other places. The people are quite willing to invest money in a concern in which they have confidence, and demonstration is all that is

necessary here to make many of the Industries a success. Careful teaching and organisation are essential, but the spirit of Industrial enterprise is more evident here than in many other places. A depot for the Weaving Industry should be organised and there should be thorough care to keep the weavers up to date and acquainted with the demands of the market. They should also be able to get yarn freely and to build up co-operation amongst themselves. The headquarters of the Trivandrum to Nagercoil and the Trivandrum to Tinnevely Motor services are located here and in consequence there are a large number of motor mechanics and drivers, fitters, etc., in the Taluk. The tea and rubber from the estates of the south all find their way through the Taluk on route for shipment, etc. There are numerous estates in the vicinity. The Taluk is one of great possibilities and capital would be forthcoming if properly encouraged.

KUNNATHUR TALUK.

Area.—171.49 sq. miles. Population —91,390. No. of houses.—17,828.

No. of Pakuthies— 9. Taluk Town.— Adur.

Location.

Division.—Kunnathur is situated in the centre of Quilon Division and is an inland taluk.

Boundaries.—NORTH.—Mavelikara Taluk and Chengannur Taluk. The Achencoil river divides Kunnathur from Chengannur Taluk.

SOUTH.—The Kallada river forms the southern boundary of the taluk and divides it from Kottarakara and Quilon. Pattanapuram also forms a portion of the southern taluk.

EAST.—Chengannur Taluk.

WEST.—Karunagapally Taluk.

Railway.—No railway runs through the taluk. The nearest railway station is at Kottarakara and is $13\frac{1}{2}$ miles from Adur. Most of the traffic goes through Kottarakara.

Backwaters and Rivers.—It is an inland taluk and no backwaters touch it. The Ashtamudi lake comes very near to the taluk in the south-west and communication by water

is possible through the Kallada River. The Sasthankotta lake is in the western Kallada Pakuthy and is the largest fresh-water lake in Travancore.

The Kallada river forms the southern boundary of the taluk and is the main water-way. The Pallikal Aur runs near Adur and waters the northern pakuthies of the taluk

Main Roads and Village Roads.—The main central road runs north to south through Adur and divides the taluk into two equal portions. One road runs from Adur to Kayamkulam, another to Pattanapuram. All these roads are in good condition for traffic. Another good road runs north from near Sasthankotta to Pallikal passing through Poruvazhi and Churanad pakuthies. The village roads are not cartable in the majority of cases. A daily motor service runs between Chengannur and Kottarakara and passes through this taluk.

Nearest Seaport.—Quilon is the nearest seaport and is 30 miles distant from Adur. Western Kallada is 14 miles away from Quilon.

Cultivation.

Wet land area.—16,840 acres. *Dry land area.*—53,515 acres. *Unregistered land.*—16,950 acres. *Cocoanut area.*—16,593 acres.

Pakuthies.

Name of Pakuthy	Area. sq miles.	Population.	Wet land. Acres.	Dry land. Acres.	Cocoanut land. Acres
Churanadu.	15.41	Total population 91,390 persons.	2598	6562	946
Poruvazhi.	16.94		1504	6585	2500
Kunnathur.	17.44		1568	7714	1606
Pallikkal.	17.52		1560	6288	5219
Adur.	14.88		1534	6430	427
Enadimangalam.	49.09		2267	8359	...
Koduman	13.99		2233	3060	220
Vallikadu.	21.03		1484	6986	4850
Western Kallada.	5.19		1594	1234	1204

Education.**GOVERNMENT BOYS' VERNACULAR SCHOOLS.**

No. of H. G. Schools.	8.	2282 boys,	406 girls.
No. of L. G. Schools.	15.	1779 „	442 girls.

AIDED SCHOOLS.

No. of L. G. Schools, 13.	No. of boys, 580.
	No. of Girls, 332.

UNAIDED.

No. of schools,	11.	Total strength, 444 pupils.

GOVERNMENT GIRLS' VERNACULAR SCHOOLS.

No. of H. G. S. School, 1.	No. of girls	214.
No. of L. G. Schools, 3.	...	310.

ENGLISH SCHOOLS.

L. G. E. School, Adur, 3 Forms.	135 boys.	15 Girls.

INDUSTRIAL SCHOOLS.

<i>Name of School.</i>	<i>No. of pupils.</i>
Mannadi Weaving School. (Private)	27.
Kunnathur Pallikal School	42.
<i>No. of teachers.</i>	<i>Subjects taught.</i>
2.	Hand-loom weaving.

Natural products and their present Utilisation.

Paddy.—Paddy is grown over an area of 16,340 acres. One-third of the area is double cropped and the rest single cropped. The paddy grown is not only sufficient for local purposes but is also exported. The locally consumed rice is husked by the people themselves in mortars. No rice mill is working in the taluk.

Cocoanut.—The area under cocoanut cultivation is 16,593 acres. The largest area under cocoanut is in Pallikal pakuthy and is 5,249 acres. In Vallikode pakuthy 4,850 acres are under cocoanut. It is exported to Alleppey and Quilon as copra. The husks are also exported to Kallada and other places near the Ashtamudi lake for soaking purposes. Very little of it is used in the locality.

Tapioca.—The dry land is well suited for cultivating tapioca and the industry is carried on to a large extent in all parts of the taluk. Large quantities of it are consumed in the locality as it is a cheap foodstuff. The poorer classes of the people are mainly dependent on this material for their food. Export trade is also carried on to Alleppey and Quilon. Tapioca is exported only in the dry state. Increased cultivation is possible in the taluk as there are many acres of land lying waste, which could be converted into tapioca land. When more cultivation is attempted, a flour mill could be supported near the taluk. The ryots are poor, but their income could be greatly increased if more tapioca was grown.

Pepper.—This vine is cultivated to a fairly large extent in Shuranad, Enathimangalam, Koduman, and Vallikode. A major portion of pepper is exported to Alleppey and Cochin. It grows well in this taluk and a larger area could be brought under it.

Arrow root.—It grows wild in the taluk but little use is made out of it. This could be cultivated and if a mill is introduced for tapioca, this also could be turned into flour in it.

Fruits.—Plantains and bananas are grown to a large extent in the taluk. The fruits are now consumed locally. Very little export is done in this material. The fibre is not utilised in any way at the present time.

Pine-apple.—Small plantations of pine-apples are found throughout the taluk. The fruits are only produced for local consumption.

Jacks.—A large number of jack-trees is found in the taluk. The jack-fruit is consumed locally.

Mangoes.—Mango-trees are found in large numbers in the taluk and most of the fruits are sold in the local bazaars.

Trees and Timber.—Pinnai, Maravottie, and Pine are the important oil-bearing-trees. The oil-seeds are collected, dried and pressed for oil by the local people. The oil is produced only for local consumption.

Pine resin is collected from the forests and sold. It is exported to Alleppey and Quilon.

Anjili, jack, and forest trees are found in the taluk to a fair extent.

The products of the taluk, yams, tapioca, fruits, etc., are all collected on the market days at Sasthancottah and at Parakodi. The retail merchants export them to Alleppey and Quilon.

Minerals.

Iron-ore and mica are found in certain localities near Pallikal pakuthy, but the exact quantity has not yet been fully investigated.

Existing Industries.

Agriculture.—Agriculture is the main industry of the taluk. Paddy cultivation is carried on over 16,000 acres and engages about 20,000 labourers. The agricultural implements are old-fashioned, and are bought mostly from Quilon. The repairs are made by local carpenters and smiths. The average wages of an agricultural labourer are 7 Chs. a day. Under normal conditions a cooly lives on this amount. Some thousands of people are engaged in cocoanut, tapioca, and plantain cultivation. In the majority of cases this is done during the time when they have no work in the paddy fields.

Cocoanut Industries.—Although about 3 lakhs of cocoanut trees are found in the taluk, cocoanut industries cannot be said to be in a flourishing condition. Copra-making is carried on vigorously in the taluk and many oil-presses, driven by bullocks, are working. The major portion of copra is exported. The oil produced is only sufficient for local needs. The coir industry is small in this taluk, and many of the husks are not utilised at all, except for fuel. The main difficulty in the taluk is want of soaking facilities, and husk is exported for this purpose to the neighbouring taluks. The Sasthancotta lake is a freshwater lake and is not suited for soaking purposes. The introduction of fibre extracting machines would develop this industry a great deal.

Weaving.—Weavers are found in large numbers in the taluk, and the main centres of this industry are Mannady and Pallikal. Two weaving schools are established by private agencies in the taluk.

The Mannady weaving school was started in 1082 by private persons and has been working successfully for the last 12 years. Twenty-seven pupils receive instruction at present in hand loom weaving. Two teachers are employed and the expenditure on account of the establishment is met by the income obtained by the sale of the products &c.

Kunnathur Pallikal School was started in 1092 by the people of Pallikal pakuthy. The present strength of the institute is 42, and the staff consists of two weaving teachers. The total income for 1918 exceeds the expenditure by Rs. 21. The institution is thus run at a profit.

The average earning of a weaver is Rs. 9 a month. The cloths manufactured are sold locally.

Mat-Making and Basket Making.—Some hundreds of low caste Hindus are engaged in this industry. They are also agricultural workmen and basket-making is resorted to as a leisure time work, when they have no work in the paddy fields. Aeta and reeds are brought from the forests by these men and baskets and mats are made and sold in the two important markets of Sasthancotta and Parakode. There is no organisation in this industry.

Possible Industries.

Tapioca and Arrow-root flour making.—These have been already discussed and could be developed into a flourishing industry.

Coir-Making and Weaving.—Weaving industry can be improved by making the two institutions already existing as the centres of two co-operative depots and worked in the manner proposed in the general report. For coir industry the introduction of fibre extracting machines would be of much benefit. Such machines without power would cost only Rs. 500.

Plantain fibre Industry.—The possibility of this industry has been discussed in the general report. The introduction of fibre machines would be very profitable and the two weaving institutions could be made depots for the collection and sale of the raw materials and finished articles. The local weavers could be given instruction in weaving this fibre into towel, cloth, etc.

Rattan work.—A few rattan workers are found in the taluk but their work is now limited as they do not get an outside market for their articles. The raw materials are brought from the forests by the workmen themselves. There is no depot for the collection of raw material and for the collection and sale of the finished articles. If a depot on the lines suggested in the general report is established, this industry would thrive.

Mat and Basket making.—This has already been discussed. For the improvement of this industry the depot suggested for rattan work could be made to open out a branch in it for this industry also.

Foodstuffs available and used locally.—Rice, tapioca, yams, cocoanut, vegetables and fish,

Economic Statistics.

Besides agricultural workers, some thousands of people are engaged in other crafts. The details are worked out below :—

Carpenters	694	8 As. to 10 As. a day.
Masons	255	6 As. to 8 As. a day.
Sawyers	about 100	Generally contract work. Gets 10 As. per day on an average.
Blacksmiths	about 40	Contract work. Gets 12 As. to Re. 1 a day.
Basket-makers	Some thousands	Rs. 3 to Rs. 4 a month for leisure time work.
Weavers	about 100	Rs. 9 to Rs. 10 a month on an average.
Coolies	Some thousands	7 Chs. a day on an average.

Cost of Living.—

Cultivator's family	Re. 1 a day on an average.
Cooly's family	5 Chs. to 7 Chs. a day.
Single person (Middle class)	Rs. 8 per mensem.

Number in family.—

Cultivator's family	5 persons.
Cooly's family	3 persons on an average.
No. of Voters	105.
No. of Professional Men <i>i. e.</i> Vakils, Vaidyans, Govern- ment servants etc.,	540.

Co-operation.

There are no co-operative societies in existence in the taluk.

Joint Stock Companies.

No Joint-Stock Companies have been registered in this taluk.

Capital and Remarks.

There are few capitalists in the taluk, and even these people have little of ready cash to invest since they are chiefly land-owners. Co-operation for the smaller industries is the only means of development and a depot is necessary for cottage industries. Some means of freeing the tied-up capital is wanted for facilitating investments for agricultural and industrial development. Plantain Fibre and coir

extraction by machinery are the two striking suggestions for this Taluk and attention should be paid to both these industries here on an up-to-date scale.

TRIVANDRUM TALUK.

Area.	97.26 sq. miles.	Population	1,37,820.
No. of Houses	30,431	No. of Voters	138.
No. of Pakuthies	20.	Taluk town	Trivandrum.

Location.

Division.—The taluk forms the middle portion of Trivandrum Division.

Boundaries. NORTH. Chirayinkil taluk, Kadinamkulam Kayal is the limit of the northern boundary.

SOUTH. Neyattinkara taluk. The Karamanai River divides Trivandrum taluk from Neyattinkara.

EAST. Nedumangad taluk.

WEST. The Arabian Sea.

Railway.—Trivandrum is the terminus of the South Indian Railway. Three stations on the Trivandrum-Quilon Railway are found in the taluk namely Trivandrum, Kazhakkuttom and Murukkumpuzha. The taluk is thus traversed by railway on the west coast from north to south.

Backwaters and rivers.—This taluk is situated on the seaside, but the backwaters are few. The Kadinamkulam lake is on the north of the taluk and is connected with Trivandrum by a canal. The Veli-kayal lies a little to the north of Trivandrum town. The main water-way is the canal running from Trivandrum to Quilon. The Karamanai river and the Killiyar are the only two rivers in the taluk but both of them are unsuitable for traffic. Before the introduction of railway all traffic to Quilon was carried on through Trivandrum-Quilon canal.

Main roads and village roads.—The main central road from Cape Camorin passes through Trivandrum and is in good condition for traffic. Another trunk road runs from Trivandrum to Tenmalai *via* Nedumangad and is good. Among the village roads, the roads to Thiruvallam, Vizhinjam etc. are fit for cart traffic. Most of the village roads in the taluk are cartable and are in good condition; in fact, the taluk roads are all in good order for traffic.

Nearest Seaport.—Trivandrum is a seaport. There is a good pier and port office. Recently very few steamers have

called owing to the war. The Madura Co., and various other shipping firms have offices here. The port is highly suitable in hot weather and the railway is almost adjoining.

Cultivation.

Wet land area,—9601 acres. Dry land—35,436 acres.
 Unregistered land,—6479 acres. Uncultivated area—7310 acres.

Cocoanut land.—19,318 acres.

Pakuthies.

Name of Pakuthy.	Area.	Popu- lation.	Wet land.	Dry land.	Cocoa- nut land.
	Sq. miles.	per- sons.	acres.	acres.	acres.
Attapura.	6.20	5890	483	1283	1000
Cheruvikkal.	3.85	3090	479	1163	1163
Menamkulam.	3.10	4000	134	1655	655
Irupara.	4.78	2590	444	1924	112
Kazhakuttam.	3.37	8000	422	1395	1000
Iranimuttom.	2.88	4730	536	1210	1210
Muttattara.	3.48	7090	466	934	972
Chittivilagom.	3.27	7300	467	1108	90
Madattuivilagom.	3.72	5490	628	1739	1039
Kadinamkulam.	4.33	4220	219	1467	967
Pallipuram.	3.58	4380	631	1029	784
Andurkonam.	3.53	2000	471	1499	500
Kadakampalli.	4.56	5890	647	1741	1800
Palkulangara.	2.49	10350	271	712	515
Kilattonnakkal.	3.69	2190	356	1285	680
Melatonnakkal.	4.74	3090	481	1007	300
Veillur.	5.06	4060	337	2364	700
Pangappara.	3.42	2500	492	885	885
Vulliyalattura.	5.75	3700	663	1393	820
Oollur.	3.15	3370	394	1422	800
Chengalacheri.	2.13	10000	283	648	450
Vanchiyur.	2.28	11370	176	1004	1004
Anjamada.	5.40	7000	629	2545	1500
Aramada.	3.67	5210	348	1894	125
Randamada.	4.73	5560	439	2126	1010

Education.**GOVERNMENT VERNACULAR SCHOOLS.**

No. of H. G. Schools,	8.		
No. of L. G. Schools,	20.	No. of boys	3322.
		No. of Girls	998.

AIDED.

No. of H. G. Schools,	1.	No. of boys	142.
		No. of Girls	45.
No. of L. G. Schools,	67.	No. of boys	4637.
		No. of Girls	2092.

UNAIDED.

No. of Schools,	4.	Strength,	154 pupils.

GIRLS' VERNACULAR SCHOOLS.

No. of H. G. Schools,	3.	No. of Girls	1413.
No. of L. G. Schools,	9.	...	1143.

COLLEGES.

The Maha Rajah's College for			
boys,		First Grade.	Strength 627.
Do.	Do. Girls.	Second Grade	...
Training College			... 76
Sanskrit College			 259.
The Law College.			

ENGLISH SCHOOLS.

No. of H. G. Schools, (Government)	2.
No. of L. G. Schools, (Do.)	1.

AIDED.

No. of H. G. Schools,	2.	1458 pupils.
No. of L. G. Schools,	3.	156 pupils.

GIRLS' SCHOOLS.

No. of H. G. Schools, (Government)	1.	Attached to the
		College.
No. of H. G. Schools, (Aided)	1.	362 pupils.
No. of L. G. School, (....)	1.	93 pupils.

SPECIAL SCHOOLS.

The Ayurvedic Medical School, and the Survey School.

INDUSTRIAL SCHOOLS.

School of Arts (Government.)

Subjects taught.

Ivory carving, Drawing,
Painting, Pottery &c.

Kulathur Sri Rama Vilasom Weaving School,	2 teachers.
	34 pupils, Weaving.
R. V. Drawing and Painting School,	3 teachers.
	21 pupils Drawing etc.,
Kadinamkulam Coir Industrial School,	2 teachers.
	87 pupils Coir industry.

Name of School.	Staff.	Pupils.	Subjects taught.
Arthington Industrial School ...	7 teachers.	58	Cabinet making, Blacksmithery, Drawing, Painting, Carpentry &c.
Sreekanteswaram Ivory Carving Institute ...	9 „	35	Carving, Kuftgari work, etc.,
Kaladi Technical School for Girls ...	2 „	17	Weaving, etc.,
St. Michael's Technical School, Trivandrum ...	4 „	39	Lace making, embroidery, etc.

In addition to the above there are some commercial schools in existence in the town where Type-writing, short-hand, and other subjects are taught. The students are prepared for the Madras Government Technical Examinations.

Natural Products and their present Utilisation.

Paddy.—Paddy is grown over 9600 acres in the taluk, of which one sixth is double cropped. The paddy grown is insufficient for local consumption. More extensive cultivation is not possible at present. A large quantity of paddy and rice is imported into the taluk from the neighbouring taluks, from Tinnevely, and from Burma by sea.

Cocoanut.—The total area under cocoanut cultivation is 19,318 acres, but the produce per tree is not so much as in the northern taluks. Most of the cocoanut produced is made into copra and pressed for oil by local oil-mongers. The oil is mostly consumed in the locality and a small quantity exported to the neighbouring districts. There is a power driven mill in Trivandrum which takes a large amount of the copra produced. It is driven by a steam engine. The husks are exported to the neighbouring taluks for soaking. In the north-western portion of the taluk, near the Kadinamkulam lake, the soaking facilities are good and fibre is extracted,

This fibre is generally collected at Anjengo and Quilon for transmission to Alleppey, Cochin, and Paravoor for the manufacture of matting. There are few local mat-makers and these are only in a small way of business.

Tapioca.—Tapioca is grown to a large extent in the eastern portion of the taluk and some of it is exported to the neighbouring taluks. It is the chief foodstuff of the poor people. The preparation of the flour is carried on as a cottage industry by many people. Tapioca from Nedumangad and the other taluks is also imported to Trivandrum. There is great scope for increasing the cultivation of tapioca in the taluk and also for the establishment of a factory for flour extraction on a large scale.

Arecanut.—Arecanuts are found in few quantity in the taluk, but the produce is only sufficient for local consumption. The use made of arecanut at the present time is for chewing purposes. Very little export of dried nuts goes on.

Pepper.—The pepper vine is cultivated to a fairly large extent in the taluk. The pepper is collected by merchants, dried and exported. The local consumption in this commodity is only little. The proper drying and production of pepper powder could be undertaken.

Arrow-root.—Arrow-root grows wild in all parts of the taluk and is not utilised to any great extent. This could be properly collected and flour extracted. Along with tapioca flour-making, this industry would be a success. The pakuthies where this grows well are Iranimuttom, Aramada and Rendamada.

Fruits.—Plantains grow well in the taluk, and large quantities of the fruit are consumed locally. The produce is barely sufficient for local consumption and so it is often imported from the neighbouring districts.

Jacks.—Jack trees are found in the taluk and the fruit of most of them is consumed locally. The price of jack-fruits during the season is nominal.

Mangoes.—Mango trees are obtained fairly largely in the taluk, but much fruit of this variety is brought on from the southern taluks to Trivandrum.

Pine-apples.—Pine-apples are cultivated in some parts of the taluk but many are imported into the taluk from other parts of South Travancore.

Tamarind.—A large number of tamarind trees is found in the taluk. The ripe fruits are collected, dried and sold. Some of it is exported to Quilon and other places.

Besides the above mentioned, different yams, grams and vegetables are also grown.

TREES AND TIMBER.

Pinnay.—This tree is grown to a large extent in the taluk and is used for fire-wood and timber. The fruits are collected, dried, and pressed for oil. Pinnay oil is greatly in demand as a cheap lighting oil. It is extracted locally in bullock-driven presses.

Maravottie.—A fair number of trees is found in all the pakuthies. The seeds are now collected for the sake of oil, and the wood is used as fuel. The oil-pressers are paid, here as elsewhere, by punnack and a quota of oil.

Cashew-nut.—Cashew-nut trees are grown in fairly large quantity in the taluk, but at the present time only the nuts are utilised. The use of the bark as a tanning material has been discussed elsewhere in other reports.

Other trees.—Murukku, Uthi, Pala, Cherupunna, etc.

Minerals.

Monazite.—Monazite is found near Kovilam and the deposit extends over a mile at the mouth of the river.

Mica.—Phlogopite Mica is found in a vein in lateritised rocks near Vattiyurkavoo. It is now working. The deposit is fairly extensive but foully weathered.

Kaolin.—A surface deposit is found near Pallipuram, 10 miles away from Trivandrum. It is fully extensive and near the main road. The deposit goes to a depth of 30 feet. The analysis of the mineral shows about 50 % to be kaolin, in some places and an average of 40 % for the deposit.

Clay.—Ordinary clay is found to a large extent in the taluk, and is utilised for bricks and pottery work. The local potters are numerous and the clay good.

Graphite.—Graphite is also found in small quantities near the mica deposit.

Existing Industries.

Agriculture.—Paddy cultivation, cocoanut plantation, growing of tapioca and other yams are the important occupations of the people. There are over 9600 acres under paddy

cultivation. More than 40% of the people are engaged in agricultural pursuits. Larger numbers of capitalists and landlords are found here than elsewhere. The large professional population as a rule are well off, and have money to invest in a good concern. The average income of a landlord in the taluk is Rs. 200 per mensem. Their cost of living can be roughly estimated at Rs. 80 per mensem. The agricultural labourer earns six annas a day, his expenses come to 12 chs. a day.

There were two rice hulling factories in the taluk but both of them have ceased work. The rice is husked by the people in their local hullers and sold to the merchants. Some thousands of people are given employment by this industry.

COCOANUT INDUSTRIES.

Copra.—Some hundreds of persons are engaged in making copra in Pettah, Kadakavur, and other pakuthies on the coast. The copra is sold locally in Trivandrum to the Oil-Mill and various oil-mongers. But since the work of the mill is stopped, the supply from the northern pakuthies goes to Quilon. The average earning of a copra merchant is Rs. 50 a month at the least. Owing to the war this industry has declined to a considerable extent, but is now reviving again rapidly.

Coir.—Some thousands of low caste Hindus are engaged in this industry in Pallipuram, Kadinamkulam and Velloor pakuthies. Coir is produced for export to Quilon, besides the local sale, for want of soaking facilities, the husks from many parts of the taluk are exported to Chirayinkil and Quilon.

There is an industrial school in Kadinamkulam where coir industries, such as, coir-making, coir-matting, etc., are taught. Two teachers are engaged in the school for teaching coir industries on Rs. 20 and Rs. 15 respectively. The course extends over two years. The minimum qualification for admission into the school is a certificate of having passed the 3rd class of the Vernacular School. No fees are charged. Government gives a grant of Rs. 28 per mensem to this institution.

Oil-pressing.—Oil-mongers existed in large number some time ago, in Thycaud and Karamanai, but most of them have shifted from Thycaud on account of the compensation settlement laid by Government in that locality for the use of Women and Children's Hospital building, whereby the oil-mongers left. At present about 100 families

only can be found in the taluk. Each family has a bullock-driven-press. The copra is mainly obtained from Pettah. One candy of copra costs Rs. 90 at the present time. Each press consumes one fifth of a candy of copra every day, and the yield is 25 Edangalies of oil, costing about 5 to 6 fanams an Edanagali, and about 40 lbs. of punnack are produced from it. The cost of Punnack is $1\frac{1}{4}$ Chs. per lb. Their daily expenses for pressing come to 11 fanams on an average. Two persons are engaged and two bullocks. At this rate a monger gains 9 fanams a day on an average. They supply only local demands. Local merchants buy from them largely.

There were two oil-mills in Trivandrum, one in Thycaud and another near Vallakadavu. The latter has ceased to exist and the former is not working at the present time but the mill will do so soon. It is known as the C. V. E. A. S. Oil-Mill, Thycaud.

The mill was established 10 years ago by two merchants in Trivandrum with a capital of Rs. 70,000 all of which was utilised for machinery and building equipments. About two lakhs of rupees were afterwards subscribed for working capital.

Machinery.—The different parts of the mill are driven by a 35 H. P. Steam-Engine bought new from Messrs. Daniel Adamson and Co., Dunkinfield, N. Manchester. The power is utilised for driving 15 presses, one disintegrator, one turning lathe, two drilling machines and two pumps. One of the pumps is fixed in a big well higher up the factory and the other pump is used for pumping the oil from the tank to the reservoirs.

Building.—The building is extensive and the store room, drying yards are all kept neat and clean.

The work of the Mill.—The usual working hours are from 6 A. M. till 6 P. M., but when much work is in hand the work used to be continued for 6 hours in the night also. Twenty-five permanent workmen are engaged in the mill, in addition to the 3 smiths engaged in the fitting department. A boy worker is paid 3 annas a day and an adult gets 6 As. to 12 As. for the same period. The workmen are given work by turns, if the work of the mill exceeds 12 hours.

In the fitting department the expert turner is paid Re. 1 a day and his assistant from 6 As. to 8 As. In the engine department the engine driver and his two assistants are given Rs. 50, Rs. 30 and Rs. 25 respectively.

Raw Products.—Copra is imported from Balaramapuram, Pettah, Kadakavur and Vakkom. Fifteen candies of copra are pressed in the mill in 12 hours. The copra from these localities yields 60% of the oil.

Market.—All the oil is exported to Cochin but the war has stopped the outside market and the work of the mill had to be stopped. For the first two years the mill owners were working at a loss but afterwards, it began to pay them at the rate of 15% on the capital invested. They had to stop work when war broke out as there was no sale for their output. The oil used to be exported to Tinnevely and the eastern districts.

The machinery is well kept now. The owners said that work would be begun when shipping has recommenced and possibly a soap-factory could be added to this mill, and it would pay well.

Weaving.— More than a hundred families of weavers are found in the taluk. In Trivandrum alone 10 families are now engaged in the industry. Twenty families are found in Manakad, and more than 300 in Kulathur. Formerly more workers followed this calling in the taluk but most of them have discontinued owing to the high prices of yarn. Thorthus, Nariyathus, under-wear are manufactured by them and they find a good local sale. The weavers of Kulathur are specially engaged in weaving Nariyathus. In Pettah about 50 families of weavers are found. They weave inferior thorthus and under-clothing. All these articles find a ready sale in Trivandrum. Many of these weavers are under obligation to the cloth merchants who supply them with yarn and buy the articles manufactured. The daily wages or profit they get are from 8 Chs. to Re. 1-14 Chs. This is just sufficient for their maintenance and little or nothing is kept by. If the industry is worked upon co-operative system, it will be a success. There is a weaving school at Kulathur. It was established in 1901, and has at present a strength of 34 pupils. Hand-loom weaving is taught by two teachers. The Headmaster has passed the

Intermediate Grade in weaving in the Madras Government Technical Examination, and is paid Rs. 20 per mensem. The course of instruction extends over a period of five years. One hour daily is set apart for general instruction in the Vernacular and Arithmetic. Government gives a grant of Rs. 28 per mensem to this institution.

Lace and Embroidery.—The Embroidery Industry in Trivandrum District is exceedingly well organised by Mrs. Parker who has about 450 women attached to her organisation. The women are all London Mission Christians, the majority of whom are married and do the work in their spare time. This leisure hour occupation is the means of supplementing the household income by Rs. 5 per mensem in very many cases. There is no regular school for teaching the industry but there are a number of centres frequently visited by Mrs. Parker each of which is in charge of a matron who is a skilled worker. These matrons insist that their pupils have their minimum educational qualifications of being able to read. The scholars are taught sewing for the first two years, and then if proficient, they are instructed in embroidery. The market for the goods is found, by personal recommendation. The sales are affected by collecting the goods in Trivandrum where the central office receives orders and executes the same. The workers are paid for piecework only. A large number of orders is always on hand.

Recently lace-making has been introduced in St. Michael's Technical Institute for girls at Trivandrum. The school was started in 1089, and is thriving under the management of trained teachers from Italy. Thirty-nine students receive instruction in lace-making and embroidery in all. The course of instruction extends over 3 or 4 years according to skill, 17 pupils learn lace-making, 11 pupils are taught fancy work and 11 embroidery. The staff consists of a head-mistress and three assistants. No fees are charged from poor pupils. Three pupils pay a fee of Re. 1 per month. Government gives a grant of Rs. 30 per mensem. The minimum qualification for admission into the industrial school is the fourth class of any Vernacular school. General subjects are also taught in the school. Generally most of the pupils who go out of the institution are given work by the institute and payments are made for the work done. The raw materials are supplied from the institute on loan.

Bricks and tiles.—Building bricks and flooring tiles are manufactured very largely in various parts of the taluk. Small factories where building bricks alone are made could be estimated at fifteen approximately. The capital usually invested in such small factories is about Rs. 200. This industry is mostly carried on by the Ezhavas in Mekkey Pattom, where alone more than 10 factories are found. Three factories are working in Oolloor. Each of the latter has invested Rs. 400. The total output of these factories can be roughly estimated at about 15 to 20 lakhs of bricks a year. They are all used locally. The cost of these bricks is between Rs. 7 and Rs. 8. The small factory owner realises Rs. 15 to Rs. 20 a month on an average, but in the dry season, additional hands are engaged to meet with increase demands. The daily wages of a cooly are from 8 Chs. to 12 Chs. according to skill.

In Ayranimuttom a factory is working on a moderately large scale. The owner has invested Rs. 10,000 on the factory. Clay is ground in the ordinary grinding mill driven by bullocks. In this factory flooring tiles and roofing tiles alone are made. It engages 15 coolies daily both men and women. The wages of a woman are 4 As. and those of a man 7 As. a day. The average out-turn of the factory is 10,000 tiles a month, both flooring and roofing tiles together. The current price of the flooring tiles is Rs. 17 per thousand and that of the roofing tiles Rs. 32 for superior quality and Rs. 28 for the second. The sale is local. The owner says that he makes a net income of Rs. 30 a month on an average. This factory has a standing of 20 years.

Pottery works.—To the School of Arts is attached a Pottery and tile works. It is worked by a 10 H. P. steam engine and has a dozen moulding wheels. There are three grinding mills where clay is well ground. There is a fourth grinding mill of a smaller size for grinding felspar. There is also a disintegrator where granite is cut into small pieces before grinding. Eight potters and three moulders are employed. Their pay ranges from Rs. 12 to Rs. 35 a month according to skill.

Jars, flower-vases, filters, gogglets, are all made, besides fancy work, dolls and other figures. The sale is at present confined to the locality. Flooring tiles with fancy work, are

made for orders. Glazed pottery is also done here but is not developed to any extent.

Potters are found scattered about the taluk. About 10 families are found near Cannanmoolay. The average earning of a potter is Rs. 7 a month. His expenses come to the same amount and nothing is left for him to save.

Cabinet making.—There are about 20 workshops in Trivandrum, where cabinet making is carried on a large scale. Three are found in Cantonment, five in Chalai, two in Pettah, and one in Kannanmoolay. Other smaller establishments are found in other parts of Travancore. The least number of skilled artisans in each workshop is five. Almirahs, tables, chairs, and cots are made in these workshops usually. In Trivandrum alone there are more than 400 carpenters, out of whom more than a third are skilled in cabinet making. The others are engaged in house-building. Some however have no regular work. They find employment for 15 to 20 days a month. The earning of a carpenter can be estimated at 12 As. to Re. 1/8 a day according to skill. The average cost of living is 12 As. a day for a carpenter. The minimum capital required for starting a cabinet mart is Rs. 500 in addition to building and equipments. The monthly income from such an establishment is estimated at Rs. 35 to Rs. 70. Difficulty is now experienced in finding markets for outputs. No proper advertisements and catalogues are made for supplying the outside markets. If some co-operation exists among the various cabinet makers, better profit would be realised.

The P. W. D. Workshops.—The Government workshop is mainly intended for the supply of articles for Government works. It does not usually make articles for the public, especially in cabinet making. The workshop consists of a sawing department, a fitting department, a foundry and carpentry department. A gas-engine 45 H. P. supplies the required power for working the departments.

Saw-Mill.—Sawing is done by power. There are three frame saws, two circular saws, one hand saw, a planing machine, and a saw sharpening machine. One skilled artisan and two assistants are employed for each of these machines. The wages of the skilled work-man are from 18 Chs. to

21 Chs. according to skill and the assistant gets from 8 to 11 Chs. per day. The total output of the saw-mills can be estimated at about 16,000 cubic feet per month.

The Fitting Department.—This is equipped with one slotting machine, four turning lathes, one planing machine, four screw-cutting lathes, one radial drilling machine and one plate-cutting machine. All of them are run by power from the gas engine. There are six expert fitters and 25 assistants. The pay of the experts ranges from Re. 1 to Re. 1/8 and the assistant gets 14 Chs. to 21 Chs. There are about 10 turners and their pay varies from 14 Chs. to Re. 1/10 Chs. Screws and nuts and building equipments are made in this department in addition to repairs to machinery being undertaken.

Foundry.—There are two foundries, one big and one small. The smaller alone is worked at present, and one casting is done every week on the average. Two tons of iron are melted every week for casting. Railings and gates are moulded in this department and orders from outside the department are also executed. There are 16 workmen permanently employed on this work, 8 moulders, 8 coolies, in addition to the maistry. The maistry is paid Rs. 40 a month and the moulders get from 14 Chs. to 21 Chs. a day according to skill. On the casting day six additional hands are employed. This department is self-supporting when work to the extent of two tons a week is turned out.

Smiths' department.—There are 25 smiths working permanently in this department. Their work is to make hinges and other articles for building purposes. Their wages vary from 18 Chs. to 21 Chs. a day.

Carpentry department.—An expert maistry is employed permanently. The work in this department is done mostly by contract. The contractor brings his men and makes them work here. Chairs, almirahs, tables, etc., are made here. The maistry is paid at the rate of Rs. 1/8 per day, and carpenter's pay ranges from 18 Chs. to Re. 1/7 Chs. a day according to skill. On an average 15 carpenters find employment daily here.

The gas-engine installed in the workshop consumes 16 parabs of charcoal a day working for ten days.

Printing.—Of the 22 presses in Trivandrum, three are run by Government and others by private individuals. In almost all of them, English and Malayalam type alone are used. In three or four presses Tamil and Sanskrit are also printed. The chief work in these presses is printing newspapers and magazines, composing judgments, printing books, and other job-works. In Trivandrum there are more than 600 skilled compositors of whom 350 find employment in the Government Presses. Among the others 200 are employed in private institutions, while the remainder does not get full work. The average compositor composes three pages daily of foolscap size, and receives from 12 As. to Re. 1 a day. The cost of living for a skilled workman is 8 As. a day. The capital invested in a printing works varies largely. The smallest press in Trivandrum has invested Rs. 3000 and the largest private press Rs. 12,000. It is estimated that an average income of Rs. 50 per month is realised in printing presses for every thousand rupees invested. There is a scarcity of work in many of the concerns.

The largest printing establishment in Trivandrum is the Government Press. In the composing department about 250 men are employed. The pay of an average compositor is Rs. 10. In the machine department and foundry 29 men are employed. The machines are worked by a steam engine. Lately casting has been introduced. The caster is paid Rs. 9 a month. The pay of the workmen varies in this department from Rs. 8 to Rs. 40 a month according to skill.

Book-binding is one of the departments in the works. About 100 men employed are paid by piece-work. A binder earns from 4 As. to 12 As. a day on an average according to skill.

Book-Binding.—This is done in printing works, in separate shops and also in houses. Though many skilled workmen are found in Trivandrum, very few take this up as their profession. In Trivandrum there are thirty workshops where binding alone is done. In these concerns about one hundred men are employed. Each man can earn from eight annas to twelve annas a day according to skill.

The capital invested in the smallest works is Rs. 70.

The following list shows the private presses in Trivandrum and briefly indicates the work done by each firm.

Name of Press.	Station.	Nature of work done.
Western Star Press.	Cantonment.	Newspaper printing and job work.
Sundra Press.	Tycaud.	News paper printing etc.
Sreedhara Printing house.	Puthenchantai.	Book and job work.
Saraswathivilasom.	"	"
Mahadevavilasom Press.	"	"
Rama Varma Royal Printing Press.	Cantonment.	Newspaper and printing job works and judgment printing.
Subodhini Press.	"	Book work and job work and judgment printing.
Bhasha Bhushanam Press.	Pettah.	Copy books printing.
Raja Raja Varma Press.	Puthenchantai.	Job and book work.
Keralodayam Press.	Cantonment.	Do.
Bhaskara Press.	Puthenchantai.	Job and book work and judgment printing.
Anantha Press.	Cantonment.	Printing general and judgment printing.
S. M. R. V. Press	Perumthanni.	Book work and job work.
Kamalalayam Printing Press.	Puthenchantai.	Do.
Travancore Printing and publishing Co., Ltd.	Do.	Job works.
Sri Natesa Vilasom Press.	Chalai.	Do

Gold and silver works—There are about 250 to 300 families of goldsmiths in Trivandrum and 30 to 50 of silversmiths in the town. Each family has on an average two or three persons skilled in the work. They make gold and silver ornaments of various kinds. Besides supplying the local demands, they make jewels for order to individuals of the locality for the use of their friends and relations elsewhere.

Trivandrum is well noted for its work in gold and silver. The materials used are old uncurrent coins of gold and silver, also gold and silver are imported in bulk for the purpose.

One beating machine exists in the town, the size of its roller being 6" $\times$ 2 $\frac{2}{3}$ inches and this could keep working 15 to 30 persons at the same time.

The silver wares made are mainly articles used for ordinary household use, such as, cup and saucers, tumblers, dishes, buttons, watch chains, etc., besides those used occasionally in houses, as sprinklers for scents.

Only 50 to 60 goldsmiths have regular and full work for the month. They get Rs. 70 to Rs. 150 a month. The others have a hand to mouth existence and their honesty and promptness have to be taken at a discount. The working cost of articles is from 8 As. to Rs. 1/8 per sovereign weight of gold, and 3 As. to 10 As. for one rupee weight of silver. A skilled workman earns Rs. 2 a day when in full work.

No organisation of any kind exists among them, co-operation would help them to a large extent in their trade. A central depot can be opened where the skilled workmen are brought together and given work.

Kuftgari work.—Less than a dozen kuftgari-smiths are found in Trivandrum. This work is taught in the School of Arts and it is also done in the workshop near the Fort. Their work is good but they are not steady. No organisation exists among them and no capital is found. An average workman earns Rs. 30 a month at the least if he works regularly. Only local demands are supplied as they have no business method and capital. The process by which this work is done is of interest. An iron plate is taken and is roughened at the surface by filing in two directions at right angles. A fine silver wire is then taken and beaten into the plate to a design by iron hammers. The designs done are

more or less fixed and few in number comprising local scenes, etc. Boxes for cigarettes cost Rs. 12, trays from Rs. 1/8. This work should be greatly encouraged as the market for the goods is readily found. Proper organisation is necessary and to prevent the old calling becoming defunct, serious consideration should be given to teaching this industry to the younger generation.

Brass work.—There are few brass workers in the town, except the one who has recently come from Tinnevely. The brass wares are largely imported from Tinnevely, Kottar, and Vadiveeswaram.

Bronze & Copper Work.—Some hundred persons are found in the locality, who supply the local needs in culinary articles of various kinds. These are largely made here and sent to other places as well. The raw materials are imported from Bombay ; but old and broken vessels are also collected from the locality. Contract work is also undertaken, the charge being 1 Ch. to 3 Chs. per palaṁ weight of the articles produced. A clever workman can earn Rs. 25 to Rs. 30 a month. Many of these people are employed by local Chalai merchants, who pay them low wages. These skilled workmen are as a class very poor.

Iron & Steel work.—Many blacksmiths are found here. Almost all the iron and steel work of bullock bandies and judkas are made by them. A class of people known among them as "Malayam Kollan" makes good knives, scissors, etc., as well as mammatties, axes. These people are good at their work but they require proper instruction and organisation. One Ezhava blacksmith at Chakkay, melts cast iron in his crude foundry and casts moulds. Iron vessels are made by him for local uses. He has no capital to invest and the work done is very small. The daily wages of a blacksmith come to 6 fanams or Re. 1 a day.

Ivory Carving.—A large number of ivory carvers is found in Trivandrum. Fourteen carvers are employed permanently in the School of Arts. Their pay varies from 12 Rs. a month to Rs. 35 a month. In the school, more than one dozen boys are taught carving. Those who get out of the school, do private work for merchants who find markets for their articles. There is a carving institute under the name of Mr. P. S. Iyer. Here articles are made to order and for sale in Mysore, North India and Madras. The workshop and the institute contain at present 50 hands, 14 of whom are

workmen under regular pay and the rest are either apprentices or volunteers. These last, are boys, recently admitted and taught on probation for a period of 6 months after which if they like the work, they are enrolled as apprentices on a scholarship of Rs. 5 a month to start with, rising up to Rs. 10. The apprenticeship lasts for 3 years. The volunteers pay a fee of Rs. 2 a month. Those who are unable to pay the fees are taught for six months, and the fee of Rs. 12 is deducted from their stipends afterwards. The number of working days in each month is 25. The apprentices and volunteers under training are grouped into two classes. The carving is done on cocoanut shells and ivory. The images of the Hindu gods are carved. The pupils are also taught to work on models given.

Large orders are executed from Madras, Mysore, etc. The institute is self-supporting at the present time along with the business part.

Kyvan Fibre.—In Karamanai there is a community of people who make canvas out of Kyvan fibre. Kyvan sticks are brought from the forests of Nedumangad, Neyyattinkara and other places. They are soaked in the river for 2 weeks and are then beaten out and the fibre extracted. It is spun into yarn and it is woven into a canvas as substitute in an old-fashioned way. The breadth of the canvas is only 1 foot 3 in. and the price is 4 As. 6 p. per yard. The sale of the articles is confined to the locality. The weavers have no idea about the cost of production and the price of the article varies according to demand. About 300 persons are connected with this work. The cost of the raw material is little, being merely the cost of the collection plus two annas per bandy load due to the Forest Department. This industry needs organisation and careful development. The full economic value of the fibre is not yet known. For ropes, canvas, belting, etc., it is quite a good material. If new methods of extraction and weaving are introduced a wider market could then be found for the article.

Motor and Cycle Repairs.—Repairs to motor cars and cycles are done in Trivandrum at various places. The Malabar Commercial Corporation Bus Office, has a workshop attached to it, which is able to undertake repairs for motor cars, etc. There are more than a dozen skilled workmen

engaged in the workshop. The pay varies from 8 As. to Re. 1 according to skill. The number of cycle repairing shops is estimated at about a dozen. In each of these workshops one skilled workman is employed. The average daily wages of a skilled workman are from 8 As. to Re. 1/8.

Soap-Making.—There is a small soap factory under the management of Messrs. N. L. V. & Co., working in Trivandrum. Washing soaps and scented soaps are made in the factory. The capital invested is about Rs. 3000. There is no proper equipment or building for the factory. The soaps are sold locally and small markets are also found outside. The soaps are of fair quality and with scientific care could be greatly improved.

The Travancore Soap Works, Trivandrum is a firm which has recently been started. They have plenty of capital and are under the business management of a well known merchant Mr. S. Ganapathy Pillai. The scientific work is under the guidance of Mr. E. Masillamoney, B. Sc. (Lond) and their manufacturing methods are well controlled. It is the intention of the firm to install a 12 H. P. Engine and boiler and up-to-date machinery as soon as it can be procured. The quality of the plain, Borax Soap made at present is very good. Fancy varieties are not attempted. A good local market is already secured and a wider scope is certain if the present quality is maintained.

Sericulture.—Experiments in Sericulture have been made in Trivandrum and a farm for mulberry cultivation and silkworm rearing has been established in Trivandrum. The Salvation Army were the pioneers of this industry in Travancore and besides a Sericulture School aided by Government, they have also a silk weaving institution. Mulberry cultivation and silk worm-rearing are also carried on in other parts of the State both by the Agricultural Department and the Salvation Army. The cocoons are brought by the people, who rear them, to the depots and are bought up for reeling. This year the School at Trivandrum has 18 pupils. The boys who left last year went back to their homes and are now engaged in mulberry cultivation and silkworm rearing as a cottage industry. Government have sanctioned an initial grant of Rs. 30 and a monthly grant of Rs. 5 for each pupil for one year. The Trivandrum

silk works is at present housed in a temporary cadjan shed. The equipment consists of eight silk reeling machines, one re-reeling machine, one twisting machine, and seven looms for weaving. Only two of these looms are used for silk weaving, the others being used for the manufacture of cotton cloths. When a pupil has become proficient in cotton weaving, silk weaving is then given to him as an advanced course. The breadth of the silk now woven is 54 inches and the price varies from Rs. 3 to Rs. 4 per yard. Shirt-ing cloth and handkerchiefs are woven from cotton at the present time. The market for the goods is almost entirely a local one, but there are also other markets which are just being tapped. At present two men are employed entirely in silk weaving, one of whom was trained at the S. A. Tata Silk Institute Bangalore, whilst the other has been trained locally. A skilled weaver can weave 20 yards of silk per month and receives Rs. 1/1 per yard for his work. His monthly pay is thus 21/4. The total quantity of silk thread used per mensem is 8 lbs. of which 7 lbs. are imported from Mysore and one lb is obtained locally. In Trivandrum 150 lbs. of cocoons are produced annually and from these about 10 lbs. of silk thread are obtained. From the district around Trivandrum at present about 65 lbs. of cocoons are obtained annually and other cocoons are imported from Kashmir at Rs. 80 per maund. The cost of imported Silk thread is Rs. 15 per lb and the price of local thread is much less than this. Mulberry cultivation extends at present over $3\frac{1}{2}$ acres in Trivandrum and about 10 acres at Nedumangad. The total number of mulberry shrubs now planted is more than 6000.

Toy-making.—In Chalai Bazaar and also in Petta there are skilled toymakers, but not in great numbers. The former people spend their time in wooden models as Elephants on wheels, Jutkas, horses, bullocks etc., and minor mechanical toys. The people in Pettah came from near Anjengo and are very skillful. They make models in wood and clay which are painted and which represent local scenes. Sawyers, Wallams, Bullock carts are skillfully turned out and fetch a good price on the outside market. There is a considerable demand for this class of goods and with proper organisation and encouragement the industry could be developed. The price realised for a model varies up to Rs. 6. Bulletin No. 12 of this Department has set out the possibilities of this industry and pointed out the need for a central organising agency.

Fishery.—There are over one lakh of fishermen in Travancore and about 95% of these are sea fishers. The remainder work on the backwaters. It is estimated that about 35,000 coast fishermen work on the Travancore coast and their total income is approximately 25 lakhs of rupees. This works out at roughly Rs. 6 per mensem per head. They use catamarans, boats, and nets for the pursuit of their calling. In Trivandrum Taluk it is estimated that about 10,000 people are dependent on the fisheries for a living. Of these many are women and children who have to be supported by the earnings of the fishermen. A fisherman's family consisting of a husband, wife, and two or three children has to spend Rs. 12 per month for their keep. The husband earns about Rs. 6, the wife Rs. 3 by cooly work and fish trade. The income is insufficient and is supplemented by compound produce such as Tapioca, eating fish, and in many cases by Starvation. The poverty of the worker makes him resort to borrowing and the middlemen advance money at high rates of interest and take the fish from the men in lieu when they return from their labours. Thus they are constantly in debt. Further they are almost all Roman Catholics and one day's catch per week is set apart for the Church. Thus they only get the earnings of 5 days' work per week for they do not go out to sea on Sunday. The majority of the fishermen do not own their own boats and have to depend upon others for their implements. Generally the middlemen supply them with the necessary implements and realise much profit. With education they will become more thrifty and careful of their money. A co-operative credit society has already been formed among the fishermen at Trivandrum.

To find out work for the fishermen during the seasons when they do not go out fishing, it is proposed that button-making be introduced as a cottage industry among them. Mr. L. A. Netto of Valiathoray has already ordered for a set of button making machinery run by power and has bought a lathe for teaching a few hands in button-making and work is begun, so that there would be enough of trained hands, when the machinery arrives. Shank shells could also be utilised for the purpose, besides bones, nuts, etc.

Chank Fisheries.—Mr. L. A. Netto has been given the lease of the right of collection and exporting shank shells. Collection was begun at Yanayam and 17000 chank shells

were collected from that place alone. At Kollencode about 8 miles to the north of Yanayam, 2700 chank shells were collected. Last year Vizhingam, a rich chank bed, yielded only 300 shells. The total number of chank shells collected and exported was 20,000, and Government realised therefrom a royalty of Rs. 2000.

Rattan work.—Very few rattan workers are found in the taluk, most of these people being permanent settlers in Warkalay. Some of them however, come to Trivandrum for selling their goods and do work on contract locally. Rattanning chairs, sofas and cots are generally done by them in the locality. An institute would be useful in Warkalay for all kinds of rattan work and these stray workers could be organised and foreign markets supplied. Orders for the goods are easily obtained when organised work is done. At the present time the skilled workers could not supply large orders for the want of capital. No regular price is fixed and that hinders people from buying their goods. The industry would thrive well under proper instruction and guidance. The raw materials are found in large quantity in the forests and can be collected without much cost.

Leather work, Boots and Shoes making.—There are about 100 men engaged in this industry in Trivandrum. Four shops are found where this is carried on a large scale, the one under the management of L. D'Netto being the largest. The leather for the articles is imported from Madras, Cocanada and other places. From 12 to 20 workmen are employed in this workshop. At the present time not only local needs are supplied largely, but orders from the planters and other persons, even out of India, are also executed. The average workman earns Re. 1 a day in this work. Saddles and other leather goods are also done locally. The workmanship is good and comparatively cheap. This industry can be developed and foreign orders could be obtained. The question depends largely on leather supply and a Travancore Tannery would be of great value. Bulletin No. 11 of this department has dealt fully with this subject.

Foodstuffs used and available locally.—Rice, tapioca, jack, mango, yams, plantains, vegetables, fish and meat.

Economic Statistics.

In addition to the agricultural workers who are estimated at about 30,000, more than 15,000 persons are engaged in other crafts and walks of life.

Name of craft	No. of persons.	Daily wages.
Carpenters	700	8 As. to Re. 1.
Masons	700	8 As. to Re. 1.
Blacksmiths	200	Contract work. Gets 12 As. to Re 1.
Goldsmiths	300	Do. Do. average 12 As. to Rs. 2.
Weavers	500	Piece work 4 As. to 8 As. average.
Lace and Embroidery workers	500	Gets Rs. 3 to Rs. 4 a month.
Rattan workers	Nearly 50	8 As. to Rs. 2.
Shoe-makers	About 100	Re. 1 a day.
Ivory carvers	About 80	8 As. to Rs. 2.
Oil-pressers	Some hundreds	8 As. to Re. 1.
Coir makers	Some hundreds	3 As. to 6 As.
Compositors	500	8 As. to 12 As.
Fishermen	Some thousands	4 As. a day on an average.
Coolies	Some thousands	4 As. to 8 As.

Professional men. Some thousands.

They include Vakils, Government and other Officials, Vaidyans, etc.

Cost of living.—CULTIVATOR'S FAMILY, Rs. 30 a month.

COOLY'S FAMILY.—Rs. 8 to Rs. 10 a month.

SINGLE PERSON (MIDDLE CLASS).—Rs. 10 a month.

No. in family.—CULTIVATOR'S FAMILY. 6 persons on an average.

COOLY'S FAMILY.—Three to four persons,

No. of Voters.—138.

Co-operation.

Name of company.	No. of members.	Capital.		
		Rs.	as.	p.
The Trivandrum Central Co-operative Bank Ltd.,	69	62,887	3	2
The Cheriathurai Samudratheeram Co-operative Credit Society, Trivandrum.	35	58	0	0
The Cheriathoppil St. Mary's Co-operative Credit Society.	47	1,081	0	0
St. Joseph's co-operative Credit Society.	20	1,057	0	0
The Trivandrum Co-operative Distributive Society.	233	5,180	0	0

Joint Stock Companies.

Name of company.	Object.	Capital.	Paid up.
		Rs.	Rs.
Trivandrum Permanent Fund Ltd.,	Banking.	67,128	56,540
The Malabar Commercial Corporation Ltd.	Motor Service and other commercial business.	74,725	74,055
Travancore Printing and Publishing Co., Ltd.,	Printing.	6,611	3,282
The Bharatha Kesari Printing and Publishing Co., Ltd.,	Printing.	20,000	authorised capital.
The Travancore Cardamom Estates Co., Ltd.,	Cultivation of pepper, Cardamom and Rubber, etc.	22,900	authorised capital.

Capital and Remarks.

The total joint-stock capital subscribed is Rs. 1,48,464 and the paid up capital Rs. 1,33,877. The authorised capital for the registered companies is Rs. 5,46,000. The total co-operative capital invested is Rs. 70,263. Trivandrum, being the capital of the State is also the financial centre. Capital for industrial purposes is available and if good reliable demonstrations are carried out then there will be no lack of funds for the furtherance of any particular industry. With regard to co-operation probably more actual co-operation is found here than elsewhere, and there is still larger scope for the work. From the point of view of the capital Trivandrum is particularly favourable. Trivandrum is the Head-quarters of Government and there are many Officers who are ready to invest in reliable concerns. The chief point here is to convince the investor of the success of a project by demonstration or otherwise.

NEDUMANGAD TALUK.

Area—365.97 sq. miles.	Population.— 88,150
No. of Houses—17,522.	No. of pakuthies.— 12
Taluk Town—Nedumangad.	

Location.

Division.—This Taluk is situated in the centre and east of Trivandrum Division.

Boundaries.—**NORTH.**—Kottarakara and Pathanapuram taluks.

SOUTH.—Neyyattinkara Taluk. The Neyyar forms a portion of the southern boundary dividing this taluk from Neyyattinkara.

EAST.—Tinnevely district and Neyyattinkara taluk.

WEST.—Trivandrum and Chirayinkil taluks.

Railway.—Trivandrum is the nearest railway station from the taluk town and is 15 miles distant. From Nelnad pakuthy the nearest railway station is Murukumpuzha. Good cartable roads connect the railway stations with these places.

Backwaters and Rivers.—Nedumangad taluk lies inland and is not washed by backwaters. Water communication is not possible in this taluk. The Karamanai river, the Killiyar

river and the Kallar have all their sources in the forests of this taluk but none of these is navigable in the taluk. They are not useful therefore for the purposes of transport.

Main Roads and Village Roads.—The Trivandrum-Tenmalai road traverses the taluk right across the centre. It is a good cartable road. A good road runs from Trivandrum to Kilimanur cutting through the western portion of the taluk, leaving it at Vamanapuram. From Anad on the Trivandrum-Tenmalai road, one road goes to Kallar and branches off to the different estates on the Hills. From Palode on the Trivandrum-Tenmalai road, one road goes to Ponmudi Sanitarium and another to Vamanapuram. There are many other village roads which are cartable. In general, communication by land is good. Most of the produce of the taluk is transported to Trivandrum by carts.

Nearest Seaport.—Trivandrum is the nearest seaport and is 15 miles distant from Nedumangad.

Cultivation.

Wet land area,	13,555 acres.
Dry land area,	50,497 acres.
Unregistered land,	61,025 acres.
Uncultivated land,	42,263 acres.
Cocoanut land area,	9,533 acres.

Pakuthies.

Name of Pakuthy.	Area sq. miles.	Wet land acres.	Dry land acres.	Cocoanut land acres.
Arinadu	14.32	1007	2223	823
Mannurkara	6.75	536	1823	175
Karakulam	12.09	843	3358	1000
Kulathummel	8.65	849	4479	200
Anadu	42.37	1070	3238	100
Nedumangad	12.74	1114	4856	117
Perumkulam	15.20	493	3849	948
Nallanadu	20.82	1090	4966	565
Vamanapuram	29.65	1216	3089	500
Manikal	12.88	1036	4755	2000
Vembayam	11.76	654	2499	1000
Uzhamalakkal	29.27	1071	2302	975
Vellanadu		1008	4372	1000
Pallode		893	1711	25

Education.

GOVERNMENT BOYS' VERNACULAR SCHOOLS.

No. of H. G. Schools. 3. No. of boys, 1173. No. of girls, 130.
 No. of L. G. Schools. 17. „ 2271. „ 485.

AIDED SCHOOLS.

No. of L. G. Schools. 22. 1009 boys.
 353 girls.

UN-AIDED SCHOOLS.

No. of Schools. 19. Total strength, 689 pupils.

GIRLS' VERNACULAR SCHOOLS.

<i>Name of School.</i>	<i>Grade.</i>	<i>No. of Classes.</i>	<i>No. of Girls.</i>
Nedumangad	H. G.	5	168
Uzhamalakal	L. G.	3	47
Karakulam	L. G.	3	71
Vembayam	L. G.	3	85

ENGLISH SCHOOLS.

There are no English Schools in the Taluk.

INDUSTRIAL SCHOOLS.

No industrial schools are in existence in this taluk but it is now proposed that one be started by a Mission Organisation.

Natural products and their present utilisation.

Paddy.—This is the chief product of land cultivation and grows well in the taluk. The paddy lands are generally found in the valleys between the hills and hillocks and are very productive. The total area under paddy cultivation is estimated at 13,555 acres and is wholly double cropped. Paddy is produced not only for local consumption but is grown for export. The export is mostly to Trivandrum. Very little artificial manuring is needed in this taluk as manure from the hill and forest parts is washed down by the rain into the paddy fields. Lands suitable for paddy cultivation are found uncultivated in many places and probably if water supply is assured these could be utilised.

Tapioca.—Tapioca is grown in large quantities in the taluk. It is the main stay of the low class of people. Many cartloads are exported raw to Trivandrum. Certain people slice and dry the root and export it to Trivandrum. Many thousands of acres are found in the taluk where tapioca could be cultivated. Tapioca is one of the most important crops of the taluk. It is a crop highly suitable for the land here. The establishment of a flour-mill in the neighbourhood is a practical possibility and it is certain lands now lying waste could be utilised. Further the local supply is sufficient to maintain a factory and good water is available. Tapioca flour could be easily worked up here.

Cocoanut.—Cocoanut trees are planted in the valleys of the hills and hillocks but the produce of the tree is not so great as that of trees near the sea-side. There are 9,533 acres under cocoanut cultivation and among the cocoanut trees are found arecanut trees also. Copra making is carried on a small scale and copra is mostly utilised in the locality for oil. The husks are exported to Trivandrum by cartload, for soaking purposes. The introduction of coir extractors will be of much benefit to the people of this taluk.

Arecanuts.—Nearly two lakhs of arecanut trees are found in the taluk. Most of them are planted along with the cocoanut trees. The nuts are prepared and exported to Trivandrum and Quilon. The ripened nuts are consumed locally and are exported to Trivandrum.

Tea.—In Ponmudi there are seven important tea estates which cover a total area of 2360 acres. All of the estates are working well under efficient management. Most of the produce is exported *via* Trivandrum to the various ports.

Coffee.—Coffee plantations were in existence formerly but owing to pests, all of them are now defunct.

Rubber.—Over 500 acres are now cultivated for rubber. They are in the hands of Indian and European owners. There is other land in plenty here which could be utilised for rubber cultivation and an extension of the industry is possible.

Pepper.—The pepper vine is extensively cultivated in the taluk and grows well. Pepper is taken by contract by merchants, dried and exported. Small merchants buy green pepper on market days and dry and sell it to big merchants in Trivandrum. Very little of the pepper is consumed

locally and the trade is almost wholly for export. The total quantity of pepper exported is roughly estimated at about 1000 candies a year and the value realised is more than 2½ lakhs of rupees.

Plantains.—A large number of plantains is found in the taluk. The fruit is sold in the local markets and also sent to Trivandrum. The fibre is neglected at present but the introduction of extractors should make it profitable.

Lemon Grass.—Lemon grass grows wild in the forest and on the hills of the taluk. Formerly stills were working at Kallar and other places but all have ceased to work. The oil was found to have low citrol content, but if redistillation was properly done, as indicated in our bulletin, then the raw material could be utilised fully and a profitable industry started. The Plantations near Kallar Bridge and some of the higher valleys are specially prolific.

Other products.—Pine-apple, sweet-potatoes, yams, oranges, jack and mangoes are all grown well in the taluk.

Trees and Timber.—The major portion of the taluk is forest land and all the forest trees are found in abundance; Teak, Vengai, Pinnay, Pala, Maruthu, etc., are among the important forest trees.

Aeta and Bamboo.—Aeta and bamboo are found in large quantity and are now utilised for making baskets, mats, etc. The workers now cut and collect their own bamboo from the forests.

Minerals.

Graphite is found in Ariyanad pakuthy and was once worked on a large scale. There are still deposits of considerable size and value available. The quality of the graphite is good. Garnet is found in the rocks on the hilly portions and also traces of monazite. Gold prospecting, was unsuccessfully pursued here. Good clay for pottery is found in Neduman-gad District.

Existing Industries.

Agriculture.—Agriculture is the main industry in the taluk. Paddy cultivation, rubber and tea plantation, tapioca plantations, and yams, are engaging the attention of the workers. There are about 50 persons who earn about Rs. 400 a year from agricultural pursuits. Their cost of living may be estimated at Rs. 25 a month. The agricultural cooly gets

four annas a day as wages. Many of them are engaged in the various tea and rubber estates and only a few men are available for local purposes.

Cocunut Industries.—Copra making and oil pressing are among the important cocunut industries in the taluk. These are carried on only for supplying the local needs. The oil expressing is solely done in bullock driven mills, of which nearly 50 are found scattered about. The conditions of labour are as elsewhere, and the workman gets the "Punnack" or a small pot of oil for his wages.

Coir making is not carried on for want of soaking facilities. The husks are exported by cart-loads to Trivandrum and other places for fibre extraction. Fibre extractors are badly needed here.

Basket and Mat making.—Aeta and bamboo are utilised by low caste people for making baskets and mats. They are sold locally. This is only a small industry, and, owing to the comparatively small local supply of raw material, it cannot be greatly enhanced.

Tapioca.—Tapioca is sliced, dried and exported in quantity to Trivandrum and other places. As already pointed out, this industry is a most important one in the taluk, and over 1000 acres are under cultivation. The establishment of a flour factory is quite justified here. The root at present costs Rs. 11 per candy delivered in Trivandrum, and locally it is only 9 or 10 rupees at most.

Possible Industries.

Basket and Mat making.—Basket and mat making could be carried on in an organised way. New patterns and models could be introduced. Bamboo furniture could be made with advantage in the taluk. Co-operation and organisation are needed in all these matters.

Tapioca.—As already mentioned tapioca, arrow-root and banana-flour-manufacture can be introduced as a profitable industry in the taluk, and a mill can be established. The water supply is good and water power is also available at Arivikarai.

Fibre.—(a) *Coir Fibre.*—At present the husks are taken to Trivandrum in carts for soaking, and very little extraction is done locally owing to the lack of soaking facilities. If an extractor was introduced and the husks made to produce

whisk much of the waste could be avoided, and brush making could be introduced as a cottage industry.

(b) *Plantain Fibre*.—The introduction of small hand machines for extraction of plantain fibre, on a cottage scale would yield a large quantity of the fibre. It would then be available for weaving and also for export, the value of such fibre realises as much as £24 per ton. The industry needs the establishment of collecting depots and extraction demonstration.

(c) *Kitul Fibre*.—The sago palm is found growing in quantity in the taluk, and the extraction of kitul fibre should certainly be introduced. The best methods of extraction are yet unknown, and, at present, they simply consist in drawing the fibre out from the sheath of the leaf petiole. The whole subject needs investigation as the fibre is of distinct economic and commercial value. (See general reports.)

(d) *Kyvan Fibre*.—At present about 100 families are engaged in extracting the fibre from the tender bark of the tree. The raw supplies are cut by the people themselves and brought from the forest. The fleshy matter is separated by abrasion and then a blunt knife is used to extract the fibre by scraping. It is made into ropes and sold locally at 1 chuckram for 4 yards. It is not woven in canvas substitute, here, as is done at Karamanai.

(e) *Roselle Fibre*.—This is extracted on a very small scale from the plants grown in gardens and small compounds. Much more could be done in this direction and the matter is worthy of attention.

(f) *Cotton*.—Cotton is grown locally in a few compounds. The possibility of extension of the cultivation is small as the ground can be made to cultivate more valuable crops.

Apiculture.—One of the minor products mentioned in Mr. Chadwick's report is Bees-wax. Mr. Chadwick states that there is considerable demand for it in Europe, and quotes it as one of the things possible for export. Large quantities are also used in Travancore for polishing, etc., but at present the local supply is small. The Conservator of Forests, at my request furnished me with figures regarding the present production of this State.

It was seen from the statement that a quantity of 894 lbs. or about 50 thulams of wax may be taken as the annual output of the produce from all the Forest Divisions. Beeswax is ordinarily collected and refined by the hill-men in their old-fashioned methods by melting and straining the crude wax after squeezing out the honey from the bee-hives, and they are paid at the rate of 10 chuckrams per pound or S. Rs. 6--12 Chs. per thulam of 18 lbs. in the shape of kolevila.

The produce is usually disposed of in auction sales from the Departmental Depots, and the price realised varies from annas twelve to rupee one per pound. Sometimes the right of collection and removal of the produce is also leased out for a term of years in some Divisions. Since this commodity is easy to obtain, and no real organised attempt has been made at its production, we arranged for Mr. P. T. John of Nagercoil to be trained in bee-keeping and the various products of the culture. Mr. John has been under training and has completed a full course, both practical and theoretical, under an expert at Trichinopoly in British India. Mr. John bore his own expenses of maintenance, but his training was free. Enquiries have been received from several large export firms for the commodity, and a good market is assured. This will not be a big industry, but with proper organisation it can be made a paying business to the small ryot as an additional source of income. Organised collection and purification of the wax should be done, and the industry put on a firm basis of supply for the various markets. With a view to the encouragement and proper organisation of the industry Government have appointed Mr. John for one year to demonstrate the industry. Nedumangad has been selected as the most suitable place for the experiment. Already beelogs have been placed in the forest on the trees, and hives are in readiness. The Apiary is already established. It is the intention of the Industries Department to introduce this as a cottage industry. A honey and wax depot is also being inaugurated. Already sufficient orders have been received for this commodity, and offers to take the entire out-put of honey has been given by various people. Large orders are booked for wax for local and for foreign uses. It is hoped, before long we shall be able to demonstrate the industry fully, and instruct the local people from the depot now established in Nedumangad, so that a profitable cottage industry can be established.

Lemon Grass Oil.—At the foot of the hills and in the forest clearings, particularly near some of the old coffee estates and the places cut for fuel, lemon grass is found in abundance. Formerly, stills were working in the valley near Kallar Bridge, but in common with other places the industry declined, and the stills ceased to work. The causes of the decline were the same here as elsewhere, *viz*, the impurity of the product. There is no reason whatever, why this industry should not now be revived, if proper methods of distillation are introduced. Raw material abounds and is of annual growth, so that, if the pure product was made, transport charges could be reduced and the ready market is assured.

Tea and Rubber.—There are large areas suitable for rubber cultivation in the valleys, and in the low ground near Kallar. The opening up of new estates here would be profitable.

The Ponmudi Tea and Rubber Co., Ltd., Kallar, Trivandrum is under the management of Mr. R. Ross, the managing director of the company. The total area under tea cultivation is 1554 acres and that under rubber is 252 acres. The estates own 1463 acres of forest land for expansion and fuel purposes. Thus the total area owned by the company is 3269 acres.

The Merchiston and Invercaud estates are owned by Mrs. Marshall and are under the management of Mr. R. J. A. Moore. The two estates have 610 acres under tea cultivation and own about 663 acres of forest land.

The Augustiar estate is owned by Mr. Peter Cruikshank and extends over 100 acres of tea plantations. There are 492 acres of forest land attached to the estates.

Mr. R. Mel of Trivandrum, has 106 acres of tea plantations, 86 acres of rubber and 28 acres of reserve forests.

The Gokul estate owned by Mr. R. Ananda Rao, is situated near Vithurai, grows only rubber and extends over an area of 130 acres. The reserve land for extending the cultivation is 84 acres.

These estates are all working efficiently and there is ample scope for extending the area under these crops. The Indian owned and managed estates can be particularly mentioned. Hundreds of coolies are engaged on the plantations.

Sericulture.—Nedumangad and its neighbourhood is highly suitable for sericulture. Attempts are now being made by the various Missionary Organisations to introduce this industry as also of silk-worm rearing and silk-reeling. The land necessary for the mulberry gardens is available and industry only needs instruction and organisation.

Power.—The taluk is peculiarly fortunate in having a source of water power in the falls of the Karamanai river at Arivikarai. The stream is perennial and by means of a reservoir could be made to drive turbines and furnish power for the district and also for a wider area. This source of power and good water supply is particularly important for the establishment of a tapioca flour factory, and renders the site most suitable and in the heart of the tapioca growing area. Electric power for other purposes might also be derived.

Foodstuffs used and available locally.—Rice, tapioca, cocoanut, jams, mangoes, jack and vegetables. Fresh meat is also available on market days. Fish is imported from Trivandrum by the fishermen on market days and sold in the market. Some hundreds of headloads of fish are brought to Nedumangad every market day. This is an important article of food among the people.

Economic Statistics.

The agricultural workmen form 50 % of the population. The artisans could be classified as follows.—

Name of craft.	No. of Men.	Daily wages.
Carpenters. ...	40	10 to 12 As.
Masons ...	170	8 As.
Blacksmiths ...	20 Families	12 As. a day and contract work.
Basket Makers ...	500	Rs. 4 a month.
Coolies ...	Some thousand	4 to 6 annas a day.

Cost of Living.—Cultivator's family. Rs. 25 a month.
 Cooly's family. Rs. 6 a month.
 Single person middle class. Rs. 7 a month,

No. in a family.—Cultivator's family. 6 persons.

Cooly's family. 3 to 4 persons.

No. of Voters— 69.

No. of Professional men—about 400.

(These include Teachers, Vydians, Vakils, Etc.)

Co-operation.

There are no co-operative societies in existence in the taluk.

Joint-Stock Companies.

No joint-stock companies have been registered in the taluk.

Capital and Remarks.

The capital available for any purpose in the taluk is small. The chief industry requiring large capital is a tapioca flour factory. Rubber cultivation also requires money, but it is doubtful whether local people would spend the initial money. Indian Gentlemen from other places are now taking up the matter, and Mr. Ananda Row of Trivandrum has an estate already bearing, which is a small model of Indian enterprise and business management. If others would do likewise, the result would be gratifying. The Apiculture Depot can also be augmented later by a depot for fibres and cottage industries, and these should ultimately come under co-operative management. The taluk has excellent roads, cheap power, good fuel, and water supply. The development of its resources is much easier, therefore, than that of many other places. A motor traction service for produce might be started when the produce exported is sufficient, and even now would probably be profitable. The further investigation of the economic and commercial values of the minor forest produce should be undertaken. The locally known "Ivory Nuts" for button-making exist in abundance, and many other products could be utilised if worked up.

SHERTALLAY TALUK.

Area—122·38 Sq. miles. Population—1,51,580.
 No. of Houses—37,078. No. of Pakuthies—14.
 Taluk Town—Shertallay.

Location.

Division.—Shertallay is situated on the western side of the Kottayam Division.

Boundaries.—NORTH.—Cochin Territory.
 SOUTH.—Ambalapuzha Taluk.
 EAST.—The Vembanad Lake.
 WEST.—The Arabian Sea (Coastal Boundary).

Railway.—No railway reaches this taluk. The nearest railway station is Ernakulam and is entirely reached by water. The distance from Shertallay town is 21 miles and a regular motor boat service runs daily.

Backwaters and Rivers.—The Vembanad lake forms the eastern boundary of the taluk. Communication by water is excellent. A canal is in course of construction connecting Shertallay with Alleppey. The transport of raw materials is carried on in vallams to Alleppey and Cochin. The taluk is well served by waterways. Regular boat services are run daily.

Main roads and Village roads.—Alleppey is connected with Shertallay by a road which is cartable for a small distance only. This road, if improved, would be of great use to the people of Shertallay to remove their goods to the markets for export. The village roads are sandy and unfit for cart traffic, in fact the whole taluk is of a sandy nature.

Nearest Seaport.—The nearest seaport is Cochin and is entirely reached by water. The distance from Shertallay to Cochin is 21 miles. Alleppey is 26 miles distant from Shertallay and is also reached by water. Most of the produce of this taluk is exported to Cochin owing to the fact that Cochin has more facilities for shipping at present. The question of better communication with Alleppey has been considered for many years. A light railway has been suggested as also a canal and a road. In any case the distance would be much shorter than at present and would assist the transport of produce greatly.

Cultivation.

Wet land area.—7,980 acres. Dry land.—23,696 acres.
 Coconut area—21,651 acres. No. of coconut trees.—
 15,00,000. No. of arecanut trees.—1,55,000.

Pakuthies.

Name of pakuthy.	Area.	Wet land.	Dry land.	Coconut area.
Arur	11.28 Sq. miles	1381 acres	1395 acres	1298 acres.
Turavur North	7.95 "	1261 "	572 "	439 "
Turavur South	3.37 "	539 "	373 "	255 "
Vayalaru East	5.71 "	333 "	820 "	782 "
Vayalaru West	9.37 "	560 "	1157 "	692 "
Kothamangalam	6.23 "	258 "	1091 "	961 "
Shertalaya South	6.25 "	438 "	2119 "	2003 "
Shertalaya North	5.25 "	292 "	1483 "	1308 "
Tannirmukkam South	14.25 "	509 "	3462 "	2001 "
Tannirmukkam North	9.33 "	173 "	1473 "	1389 "
Mararikulam South	7.17 "	493 "	2810 "	2724 "
Mararikulam North	6.52 "	346 "	2708 "	1981 "
Ariyadu South	9.98 "	505 "	2917 "	2887 "
Ariyadu North	14.53 "	588 "	2021 "	1901 "

Education.**GOVERNMENT VERNACULAR SCHOOLS.**

No. of H. G. Schools—6. 1628 boys. 173 girls.

No. of L. G. Schools—22. 2698 boys. 739 girls.

AIDED SCHOOLS.

No. of H. G. Schools—2. 415 boys. 119 girls.

No. of L. G. Schools—18. 1735 ... 557 ...

UNAIDED.

No. of Schools—22. Total strength—1199 pupils.

GIRLS' VERNACULAR SCHOOLS.

Name of School.	Grade.	No. of Classes.	No. of Girls.
Shertalaya ...	H. G.	7	328
Kadakarapalli ...	L. G.	3	88
Vayalar ...	L. G.	3	64
Muttam Tirukudumba- vilasom...	L. G.	3	88
Tannirmukkam	L. G.	4	102
Peruneermangalam ...	L. G.	3	67
Thuravoor ...	L. G.	3	91
Eramallur Nair Samajam ...	L. G.	5	Closed on 7-10-93.

ENGLISH SCHOOLS.

Government H. G. School (Incomplete). 5 forms. 296 boys 30 girls.

St. Francis L. G. School, Arattukul. 3 forms. 82 boys 9 girls.

S. D. V. H. G. School, Alleppey. 6 forms. 748 boys 12 girls.

GIRLS' ENGLISH SCHOOLS.

No schools for girls are found in the Taluk.

INDUSTRIAL SCHOOLS.

Thuravoor Weaving School, 2 Teachers, 15 Pupils. The pupils learn cotton Weaving.

Natural Products & their Present Utilisation.

Paddy.—Paddy is grown in all the pakuthies of the taluk but the supply is insufficient for the local needs. There are only 7,980 acres of paddy land in the taluk. All the paddy land is single cropped. Even though there is little scope for extension of paddy land the production of paddy can be increased by proper and scientific cultivation.

Cocoanut.—This taluk stands first among the cocoanut producing taluks of the State. The total area under cocoanut cultivation is 21,651 acres. Cocoanuts are the main product of cultivation in the taluk. The total number of cocoanut trees in the taluk may be roughly estimated at 15 lakhs. The cocoanut trees in the taluk, especially in Shertallay and the neighbouring pakuthies have to be watered during four months of the year. The trees are cared for by small ryots and agricultural labourers in place of rental. Permission to live on a small plot of land consisting of a cocoanut tope is given to a small family. This family is responsible for the proper manuring, watering, etc., of the cocoanut trees growing there. The produce of one tree is given to these families as remuneration for their work. No rental is charged and in the majority of cases, a small cottage is also constructed by the land-owners for the tenants. Copra and coir are exported in large quantities to Cochin and Alleppey even after supplying the existing oil-mill at Shertallay. The coir industry as well as the oil industry has declined considerably owing to the war, and the people are, at present feeling the strain. However, soaking facilities are excellent and

the coir industry is a flourishing one in normal times. This is regarded, in point of revenue, as one of the richest taluks in the State.

Arecanut.—Nearly two lakhs of trees are found in the taluk. The nut is chiefly consumed locally, but some of it is dried and exported to Cochin and Alleppey.

Tapioca.—Certain people have introduced tapioca cultivation as a garden crop, but the soil is not very suitable for it. Large quantities of dried tapioca are imported into the taluk from Vaikom, Kottayam and other taluks. This product forms one of the staple articles of food among the poorer classes.

Betel.—Betel vine is cultivated in some parts of the taluk and is used largely for local consumption. A small amount of it is exported to Alleppey.

Other products.

Plantain.—It is grown only to a small extent in the taluk. The fruits are consumed locally. No use is made of the fibre.

Pinnay.—Pinnay trees are found to a large extent in the taluk, and the fruits are dried and pressed, and oil is extracted. It is used locally for burning.

Jack.—Jack trees are found in abundance in the taluk and fruits are consumed locally. They are important articles of food among all classes of people.

Cashew-nut.—Large numbers of these trees are found in the taluk. The uses of the different parts of the tree have yet to be investigated. (See Neyyattinkara Taluk).

Yams, mangoes, peas, etc., are grown in small quantity in the taluk.

Trees and Timber.—Pinnay, Jack, Mango, Marottie, Karinjotta, are grown.

Minerals.

Traces of minerals like graphite have been noticed in Thannirmukkam pakuthy, but these have not been fully investigated.

Existing Industries.

Agriculture.—Agriculture is the main occupation of the people. More than 50 per cent. of the population are

connected in this calling in some way or other. Paddy cultivation and cocoanut plantation are the main occupation of the agricultural workers. There are more than 200 land-lords in this taluk, and their income under normal conditions, was Rs. 1,000 on an average every year. Their expenditure would be about Rs. 600 a year. In the majority of cases the land-lords are well off. The agricultural labourer gets 4 to 6 As. a day and lives on Rs. 10 a month. The additional expenses in the family are met by the earnings of the women who carry on coir-making and mat-weaving during their leisure hours. Also the system of rental already mentioned, viz., free house, compound and produce of one cocoanut tree or so greatly assists the people to live.

Copra making.—Some hundreds of people are engaged in copra-making. The scorching heat of the sun in the sandy parts of the taluk is used for the manufacture of good copra. The copra from this taluk is of high value, and the chief reason for it is perhaps the thorough drying facilities offered by the sand. This is the most important industry in the taluk. A portion of the copra is consumed locally by the oil-mill and also by oil-mongers who supply most of the local needs. The mill supplies outside demands also.

Oil-pressing.—There are two power-driven oil-mills in the taluk but only one is working now. The other has ceased for lack of working capital and some defect in the machinery. There is ample raw material locally and ample scope for its revival. In the other mill work goes on normally. There are 12 crushing mills situated in two rows of six each. The company is of local origin and capitalised locally. Such enterprise is greatly to be encouraged and commended. The average daily output of the mill is 60 candies of oil. One hundred candies of copra are crushed every day in the mill. There are many local oil-pressers in the taluk and they supply the local needs in oil. The factory-crushed-oil is exported direct by backwater in casks to Alleppey and Cochin.

Coir-making.—It is carried on as a cottage industry in the taluk. There are no coir mills. The fibre is extracted and exported to Alleppey and Cochin. Coir yarn is also made and exported. This taluk has excellent soaking facilities, and so the industry is a success, and will continue to be so when the markets are again normal. There is an institute for coir-making in Marariculam, run by Messrs. Peter & Sons. It is working well. The importance of coir manufacture to this taluk cannot be overestimated. It is the great

wealth of the taluk. The establishment of a coir factory here would be of great benefit. Research work on important methods of coir extraction would also do an immense amount of good. The two oil mills could be kept in full work. The introduction of small coir industries such as brush-making, coir-boot-soles, etc., as cottage industries would pay and would be of great service to the people. This taluk would do well to concentrate on the full development of its coconut product resources.

Toddy.—Toddy drawing is an industry among the poor classes of the people. The cocoanut tree is tapped partly for sweet toddy and partly for fermented toddy. Jaggery is made for local consumption out of the sweet-toddy by the usual methods.

Cadjan mats.—Cadjan mats are made by many people and sold locally for roofing. The cadjan industry is now a large and flourishing one. The utilisation of the centre stalks for match sticks has been suggested and proved. Locally made leaf boxes are available. This could easily be done here as a cottage industry.

Weaving.—At a place about 2 miles from Shertallay, there is found a small community of weavers. There are now 100 families working. They weave inferior cloth used by the local people. At Thuravur there is a weaving school. The number of pupils instructed in the institution is fifteen. The yarn used here is purchased from Alleppey. It cannot be said that this community is flourishing and the high price of yarn has caused many to forsake their calling. For local purposes they could be revived and assisted.

Mat-making.—Screwpine mats are made by a few people and sold in the local bazaars. This is only a small industry in the taluk but is capable of extension. The extraction of fibre from the centre stalk could also be introduced with profit.

Rattan Work.—Several persons do this work but the local demand is very poor. The workers are mainly isolated people from other places. It is reported that canes can be obtained in quantity in the taluk, and the industry could be organised on a commercial scale in a depot established for the purpose.

Fishery.—Some thousands of people are engaged in this industry. Fish is cured and exported to Cochin and

Alleppey. The average earning of a fisherman is 5 As. a day. The average family of fishermen consists of five members and the expenditure incurred is about 9 As. a day. This increase is generally met by the income obtained by the women in coir-making and cooly work. Some of the fishermen collect shells and sell them locally at the rate of 18 edangalies per chuckram, for purposes of lime burning.

Printing.—One printing press is working in this taluk, namely, "The Rama Chandra Vilasom Press". The work undertaken is of a general nature and books, etc., both in English and Malayalam are produced.

Possible Industries.

Cocanut Industries.—Copra-making, coir-making, and oil-pressing could be carried on in a more scientific manner. Artificial heating arrangements could be introduced for the preparation of copra even in rainy seasons. This taluk is one in which any industrial development should necessarily be directed, first, to coir which is the main industry and the greatest source of wealth. The improvement of the coir industry is a question of the utmost importance here.

Soap and Candle making.—Soap and candle manufacture could be introduced in this taluk on a factory scale. Besides, cocanut oil, pinnay oil, maravottie oil, etc., can be obtained in the taluk. The establishment of a soap factory would be an easy matter as raw materials are cheap and plentiful.

Fish-curing and Canning, etc.—Since a large quantity of fish is obtained in this taluk, the manufacture of fish oil might be introduced on a small scale. Fish canning and tinning could also be started but probably Alleppey would be a better place for the factory.

Rattan.—Rattan work could be introduced and new patterns for outside market could be taught to the workers. An industrial depot could do this work.

Foodstuffs available and used locally.—Rice, tapioca, chenai, cocanut, yams, plantains and fish.

Economic Statistics.

The working population in the taluk can be estimated at about 35,000. The artisans including carpenters, masons,

blacksmiths, etc., would be some thousands. They are divided as follows:—

Name of craft.	No. of men.	Daily wages.
Carpenters	300	8 As. a day.
Masons ...	200	6-8 As. a day.
Blacksmiths ...	Very few.	12 As. a day. Mostly contract.
Weavers ...	100 families.	Rs. 8 to Rs. 10 a month.
Coir-makers ...	Some thousands.	Rs. 4 to Rs. 5 a month.
Copra-makers ...	Some hundreds.	Average Rs. 20 a month.
Coolies ...	Some thousands.	7 to 8 Chs. a day.

Cost of living.—Cultivator's family. Rs. 20 per mensem.
 Cooly's family. Rs. 9 per mensem.
 Single person. Rs. 8 per mensem.

No. in a family.—Cultivator's family. 5 persons on an average.
 Cooly's family. 4 persons.
 No. of voters :—237.

Co-operation.

No co-operative societies are in existence in the taluk.

Joint-Stock Companies.

The Travancore Karapuram Vyavasayam Co., Ltd.—Rs.
 2,00,000.

Capital and Remarks.

The taluk is certainly a rich one, but its wealth is chiefly in one commodity namely the cocoanut. The Joint-Stock company now registered has a paid up capital of over Rs. 70,000 and in a good coir year much more money would be available. The introduction of a power-extractor for coir might prove successful. The two oil-mills should certainly be kept in full work, and a soap factory could be started. The communications by water are good and the taluk is prosperous in normal times. Cocoanut products of all kinds should be developed first here. The whole area is not salubrious for the health, but the taluk is rich in cocoanuts. The capital

for any project such as suggested in the report should be easy to raise if the confidence is gained in industrial enterprise. Co-operation has not yet taken any hold of the taluk and a depot for cottage industries is an essential for their success.

MINACHIL TALUK.

Area—138.46 sq. miles. Population.—75,340. No. of Houses—15,600.

No. of Voters.—95. No. of Pakuthies.—6. Taluk Town. Pala.

Location.

Division.—The taluk occupies the eastern portion of the Kottayam Division.

Boundaries.—NORTH.—Thodupuzha Taluk

SOUTH.—Kottayam Taluk.

EAST.—Peermade Taluk.

WEST.—Muvattupuzha Taluk and Ettumanur Taluk lie on the south-west of Minachil taluk.

Railway.—The nearest railway station is at Ernakulam and is 52 miles away from Minachil of which 21 miles are by water and the rest by road. There is no railway in or near the taluk.

Backwaters & Rivers.—The taluk is not reached by backwaters. The Vembanad lake is about 22 miles away. The Minachil river flows through the middle of the taluk, turns southwest and falls into the Vembanad lake. This river is navigable for boats up to Pala. The water communications cannot be said to be good.

Main Roads & Village Roads.—A branch of the main central road runs from Ettumanur to Pala and to Erattupetta and is in good condition. From Erattupetta a good road goes due south to Kanjirapally. Another road connects Pala with Ponkunnam on the Kottayam-Kumili Road. There is a road running due north from Pala to Thodupuzha. Other cartable village roads are found in the taluk. In general, the means of communication in the taluk by road are satisfactory although certain village roads need attention and repair.

Nearest Seaport.—Alleppey is the nearest seaport and is 40 miles distant, of which 20 miles are by water and the rest by road. All the products are taken to Alleppey or Cochin *via* Ettumanur and Kottayam.

Cultivation.

Wet land area.—3653 acres. Dry land area.—74,673 acres.

Unregistered land.—9299 acres, Coconut area.—46,429 acres

Pakuthies.

Name of Pakuthy	Area. sq miles.	Population persons.	Wet land. Acres.	Dry land. Acres.	Coconut land. Acres.
Minachil.	20.53	17790	427	12197	8000
Ramapuram.	36.43	14260	1510	18802	476
Lalam.	10.01	6110	817	5808	5308
Bharananganam.	12.15	6150	814	6975	4270
Puliyannur.	16.54	13680	935	9344	6229
Kondur.	42.80	15350	148	21545	21545

Education.

GOVERNMENT BOYS' VERNACULAR SCHOOLS.

No. of H. G. Schools.—6. No. of boys. 1248. No. of girls 247.

No. of L. G. Schools.—19. No. of boys. 2328. No. of girls. 875.

AIDED.

No. of H. G. Schools.—4. No. of boys. 709. No. of girls. 106.

No. of L. G. Schools.—61. No. of boys. 2036. No. of girls. 1752.

PARTIALLY RECOGNISED SCHOOLS.

No. of Schools. 1. Total strength. 22.

GIRLS' VERNACULAR SCHOOLS.

Name of School.	Grade.	No of Classes	No. of Girls.
Pala	H. G.	5	288
Edamattom	L. G.	3	80
Mutholi St. Joseph's	H. G.	7	298
Bharananganam	L. G.	4	145
Kondur	"	3	128
Cherpunkal Holy Cross	"	5	82

ENGLISH SCHOOLS.

<i>Name of Schools.</i>	<i>Forms.</i>	<i>Boys.</i>	<i>Girls.</i>
Govt. L. G. E. School. Bharananganam	3	120	7
St. Thomas L. G. E. School, Pala	3	219	

GIRLS' ENGLISH SCHOOLS.

No girls' English schools are established in the taluk, but the girls are admitted to the boys' schools.

INDUSTRIAL SCHOOLS.

There are no industrial schools established in the taluk.

Natural Products and their Present Utilisation

Paddy.—Paddy is the most important product of cultivation in the taluk. The total area under paddy cultivation is 3,653 acres and a little more than half the portion of it is single cropped. The area under paddy occupies about 4.1% of the total area of the taluk. The paddy grown here is not sufficient for the local needs. Rice and paddy are therefore imported from Alleppey and also from the neighbouring taluks.

Tapioca.—Cultivation of tapioca is carried on extensively in all pakuthies. Unregistered land suitable for tapioca cultivation is found to a large extent in the taluk. The present out-put is not sufficient for export and most of it is consumed locally. This is one of the taluks where tapioca production could be enhanced.

Cocoanut.—The total area under cocoanut has been estimated at about 46,453 acres, and the number of trees is about $4\frac{1}{2}$ lakhs. The cocoanut trees are planted amongst the arecanut trees along the river side. Copra is exported from this place to Alleppey and Cochin. Coir making is very little compared with the number of trees. This is due to the lack of soaking facilities. Mechanical Extractors for making whisk & producing coir would work well and be a good thing for the taluk as the thousands of husks now wasted could be utilised.

Arecanut.—A large number of arecanut trees are found in the taluk. The nuts are used for local purposes and some are exported in the dried state to other taluks. It has already been mentioned that the full economic value of these nuts has yet to be estimated.

Sugar-cane.—This taluk is a large sugar-cane growing area. Plantations are found on both sides of the Minachil river. The Ettumanur sugar mill is ideally situated to deal with the produce of this district and if our observations in the Ettumanur report were carried out it would be successful. The present system of sale is one where the cultivation takes advances from the merchant who has then a claim on the jaggery produced. The balance less interest on advance is paid when the jaggery is handed over. The method of making the jaggery is described in the report on Tiruvella Taluk.

Pepper.—The Pepper vine is cultivated to a large extent in the taluk and much more of it could be grown. Pepper is dried and exported to Alleppey and the price realised is Rs. 7 per thulam. The quality is good and the quantity could be greatly increased.

Ginger.—Ginger is cultivated in all the parts of the taluk. It is dried and exported. Little of it is used locally. If ginger and fruit preserving industry is started in Ettumanur, ginger from this taluk could be utilised profitably.

Turmeric.—This is grown in sufficient quantity for export. It is boiled, dried and exported to Alleppey. A small portion is used locally for culinary purposes.

Rubber.—Rubber grows well in the eastern parts of the taluk and there is scope for increased cultivation. Rubber is sent to Cochin via Kottayam for export.

Fruits.—Plantains, pine-apples, mangoes and jacks are grown well in the taluk. They are now locally consumed. The establishment of a fruit preserving factory at Ettumanur would greatly enhance the quantity of fruit produced.

Trees and Timber.—All the important forest trees are found in the taluk i. e., Teak, Anjili, Poovan, etc., Umbrella palms are grown largely in the taluk. The leaves are used for thatching houses for making umbrellas for local purposes. The people make flour out of the palm by crushing the inner fibrous portion of the stem and use it as a foodstuff. The dry seeds are not made use of, but if a depot is established to collect them, they can be utilised for making buttons. The leaf can be used for making match-boxes.

Minerals.

Minerals of value have not yet been found in the taluk.

Existing Industries.

Agriculture.—This is the main occupation of the people. More than 25,000 people are connected with this industry either as farmers or skilled agricultural labourers. Paddy cultivation is carried on over 3,653 acres, and rubber, coconut, sugar-cane, tapioca, pepper, ginger, etc., also engage many thousands of people. The average income of a land-owner is Rs. 400 a year. The average wages of an agricultural labourer is 8 chs. a day. This is barely sufficient for his expenses. The agricultural implements and other necessary things for the use of the agriculturalists are imported from Cochin and Alleppey whilst a few are of local origin.

Cocoanut Industries.—Copra making is carried on by about 700 persons in Kondur, Minachil and Puliannur paku-thies. Copra is exported to Alleppey. The price of copra was Rs. 60 per candy.

The coir industry as already mentioned is not found in the taluk, owing to the lack of soaking facilities. The introduction of fibre extracting machines would be very useful in the taluk. At the present time the husks are burnt for fuel and little care is taken of its value as a fibre material.

Tapioca Industry.—Tapioca flour is extracted by a few persons in the taluk and is sold locally. This taluk could be a great source of supply of raw material for a flour factory if one was established near Kottayam.

Rubber.—The cultivation of rubber trees, and the preparation of crude rubber are carried on at the estates. As already mentioned there is scope for increased cultivation. Rubber is now exported to Alleppey and Cochin. Over 700 acres are now under rubber cultivation in the taluk and the whole area is bearing well.

Umbrella-making.—This industry is a small one and is carried on by the low-caste people. The leaves of the umbrella palm are used for the purpose. The umbrellas find only a local sale.

Printing.—The Mar Thoma and St. Mary's Presses undertake all kinds of printing work and are the only two presses working in the Taluk. Both these presses are well patronised. Between 20 and 30 people are connected with this work here.

Possible Industries.

Rubber and Sugar-cane.—These have already been fully

discussed and are points which require attention and development.

Match-making.—The leaves of the umbrella palm can be used for making match boxes. This could be introduced as a cottage industry and instruction could be given to the local ryots. The forest abounds in soft-wood which can be utilised for match making.

Coir Industry.—This could be started by introducing fibre extracting machines. Local ryots could be taught handling the machine and supplied with machines.

Kittul fibre is obtained from the *Caryota urens* or Sago palm which grows well in this taluk. The chief commercial value of the palm lies in the fibrous cords or fibro-vascular bundles found naked at the base of the leaf-sheath and within the petioles, flowering stocks and even the stems as well. This constitutes the strong Kittul fibre of Ceylon and Salopa of Orissa, a fibre which also comes from Bombay and Burmah. It is made into ropes, brushes, brooms, baskets, etc. As a brush fibre it was described in the Treasury of Botany 1816 and has been shipped from Ceylon to England since 1860.

Toddy and jaggery are manufactured by tapping the Indian Sago-Palm by the local people. The jaggery made therefrom could be utilised for making sugar and this could be an additional source of sugar. All that is necessary is a vacuum pan and bleaching facilities.

Foodstuffs used and available Locally.—Rice, tapioca, yams, arrowroot-flour, jack, fruits, etc.

Economic Statistics.

Besides agricultural labourers and small land-owners, there are more than 4000 skilled artisans. They can be roughly divided as follows.—

Name of craft.	Number.	Daily wages.
Carpenters.	235	4½ fanams.
Masons.	137	4 fanams.
Copra-makers.	700	
Oil-pressers.	150	Rs. 7 a month.
Blacksmiths.	a few.	12 As. a day,
		only contract work.
Coolies.	2000	9 Chs. a day.
Professional men.	170	

Cost of living—CULTIVATOR'S FAMILY.—Rs. 25 a month.

COOLY'S FAMILY.—Rs. 8 a month.

SINGLE PERSON.—Rs. 7 a month.

Number in family—CULTIVATOR'S FAMILY.—6 persons on an average.

COOLY'S FAMILY.—4 persons on an average.

No. of Voters.—95.

Co-operation.

No co-operative societies were established till the end of 1092.

Joint Stock Companies.

The Minachil Rubber Co., Ltd., Pala. Rs.1,50,000.

The Travancore Commercial Co., Ltd., Pala. Rs. 50,000.

Capital and Remarks.

The total joint-stock capital is two lakhs of rupees. Probably more capital could be raised, but it would be well to concentrate all efforts on the development of sugar, tapioca, rubber and paddy cultivation at the outset and later to develop the industrial side of these crops. Rubber cultivation is found extended largely by Indian firms.

THODUPUZHA TALUK.

Area—560·85 Sq. miles. Population.—39890. No. of Houses—12,563. No. of Voters.—58. No. of Pakuthies.—6. Taluk Town.—Thodupuzha.

Location.

Division.—Thodupuzha is one of the eastern taluks of Kottayam Division. It forms the north-eastern portion of the division.

Boundaries.— NORTH—The hilly parts of Muvattupuzha Taluk.

SOUTH—Minachil and Peermade Taluks.

EAST—Devicolam Taluk. The Periar river is on the eastern boundary and divides the taluk from Devicolam.

WEST—Muvattupuzha Taluk.

Railway.—No railway touches the taluk. The nearest railway station being Alwaye, which is 33½ miles away. The products of the taluk, that are to go by rail or sea such

as rubber, are first brought by cart-load to Alwaye, where they are placed on the railway or backwaters.

Backwaters and Rivers.—This is an inland taluk and is not touched by the backwaters. The Periyar forms the eastern boundary of the taluk, and turns away in a north-westerly direction. For a short distance it divides this taluk from Muvattupuzha taluk. The Muvattupuzha river has its source in the taluk and has many tributaries. They are not navigable, but help agriculture. Wood from the forests is generally floated down the rivers in flood time. The rivers supply the water for the various rubber estates.

Main Roads and Village Roads.—This is a hilly taluk but nevertheless, there are some good roads used for cart traffic. The Muvattupuzha-Thodupuzha road, the Thodupuzha-Karimannur road, and the road to Kaliar Estate are good. Since the majority of the produce of the taluk has to be conveyed by road, it is essential that they are kept in good order. Many of the village roads leave much to be desired, and it would be well if local effort was directed in this channel, and the High Ranges improved for traffic.

Nearest Seaport.—Cochin is the nearest seaport and is reached *via* Alwaye. The distance to Cochin is 46 miles, and is almost reached by road. The last 16 miles are by backwater.

Cultivation.

Wet land area.—8,815 acres. Dry land area.—68,168 acres. Coconut area.—6,022 acres. Unregistered area.—44,337 acres. No. of coconut trees, 35,000. No. of arecanut trees, 200,000.

Pakuthies.

Name of Pakuthy.	Area. Sqr. miles.	Population. Persons.	Wet land. Acres.	Dry land Acres.	Coconut land. Acres.
Manakkodu ..	18.48	4000	1091	7732	1292
Kumaramargalam ..	27.68	11960	2545	12239	580
Thodupuzha ..	17.44	6900	908	7627	1150
Karikkodu ..	75.13	8500	1268	17143	2000
Kanny Elam Forest ..	72.28	...	...	...	...
Kanny Elam Tract ..	109.42	...	...	...	...
Karimannur ..	4.19	7820	3002	23435	100)

Education.**GOVERNMENT BOYS' VERNACULAR SCHOOLS.**

No. of H. G. School, 1. No. of boys 372. No. of girls 24.
 No. of L. G. Schools, 10. „ 978. „ 390.

AIDED.

No. of L. G. Schools 3. „ 238 „ 30.

PARTIALLY RECOGNISED SCHOOLS.

No. of Schools 6. Total strength 30.

GOVERNMENT GIRLS' VERNACULAR SCHOOLS.

Name of School.	Grade.	No. of classes.	No. of girls.
Thodupuzha ...	H. G.	7	127
Vazhakulam ...	L. G.	4	96

ENGLISH SCHOOLS.

Government L. G. English School, Thodupuzha., 3 forms. No. of boys, 63. No. of Girls, 5.

Infant Jesus L. G. English School, Vazhakulam, 2 forms. No. of boys 50. No. of girls. 2.

GIRLS' ENGLISH SCHOOLS.

There are no girls' English schools in the taluk.

INDUSTRIAL SCHOOLS.

No Industrial Schools are found in the taluk.

Natural products and their present Utilisation.

Paddy.—The total area under paddy cultivation is 8815 acres approximately and all of it is single cropped. This forms about one-fortieth of the total area of the taluk. Paddy is grown not only for local consumption but for export. As there is no rice-hulling-mill in the district, and as paddy is required for the coolies in the plantations most of the rice that is required by them, is obtained directly from Cochin. The establishment of a mill would be useful to the paddy growers as they could supply direct to the plantations.

Tapioca.—Tapioca is one of the most important products of agriculture. Large quantities are grown not only for local consumption but also for export. It is dried and then exported to Cochin and Alleppey. The cost of tapioca in

Thekkenbagom Pakuthy is 8 As. per para. As well as rice this is sent up to the rubber and other plantations for coolies. Tapioca cultivation can be made more extensive in the taluk and a factory for the extraction of flour could be established in a central place as has already been suggested *i. e.* Alwaye.

Arrowroot.—Large quantities of arrowroot are grown wild in the taluk, and is not cultivated. At the present time dried arrowroot is exported to Cochin and other places. In a flour-mill established near Muvattupuzha or Alwaye, as suggested, all these products would be utilised profitably, and plantations could be instituted. Flour extraction by hand methods is done now by the cottagers for home consumption only.

Lemon-Grass.—Lemon-grass is found in all the pakuthies of the taluk, and wild growth of lemon-grass is found in the forests around. It is cut down by the people and distilled in copper vessels. The crude oil is exported. Large plantations of this material are found in the locality, and many stills are in existence, but few are working. This industry thrived well formerly, but the want of proper market for the oil and the crude method of distillation resulted in a decline, which turned the people into more profitable pursuits, such as rubber plantation. Two places where the grass is found in large quantities, are Thodupuzha Pakuthy, and Kaliar Estate. The raw material is of wild growth and in plenty, and it is of good quality and high citrol content. The industry could flourish if proper distillation methods were employed.

Sugar-cane.—Along the Muvattupuzha river and its tributaries, plantations of sugarcane are found. The cane is crushed locally by bullock mills and jaggery is made out of the juice. There are thousands of acres of land which could be brought under cultivation, and Government has recently given the Ettumanur Sugar Company a concession of 1000 acres for this purpose. It is undoubtedly a good sugar growing area. Cultivation can be increased still more, and the produce would feed the sugar factory in Ettumanur which is now idle.

Pepper.—The pepper vine is grown in gardens and is also cultivated on a large scale. Formerly, much more was cultivated but the quantity declined in common with other places in the State. A large quantity of it is still exported to Cochin and Alleppey from Kumaramangalom and Thodupuzha Pakuthies. There is plenty of scope for vast improvement in this industry, and a good market awaits the produce,

Ginger.—Large plantations of ginger are found in the taluk most of it is dried and sent to Cochin for export to Europe. Cultivation of ginger could be a most profitable industry if it was extended and the question of the preservation of the root with sugar was taken up. This has already been discussed in Muvattupuzha Taluk report.

Rubber.—Rubber estates are found in the taluk and four are more prominent namely, Kaliyar Estate, Vallimuttam estate, Malankara estate and Mar Thoma Estate.

Kaliyar Estate.—This estate is situated at a distance of 9 miles from Thodupuzha. The work in the estate employs 620 labourers. The articles in general use by the workmen are imported. Along the river reeds and bamboos are grown wildy. In swampy places sugarcane grows well and can be cultivated but communication is difficult. All the rubber produced in the estate is exported *via* Alwaye to foreign countries.

The total area on which rubber is planted is 1146 acres. The estate has 344 acres of reserve land. It is under the management of Mr. A. C. Morell.

Valliamuttam Estate.—Valliamuttam estate is 7 miles away from Thodupuzha and has an extensive rubber plantation of 788 acres. It employs 430 coolies, 12 carpenters and 8 masons. There is a cartable road running into the estate. Small plantations of plantains and guavas and tapioca are found and are mainly intended for the use of the estate people. Food-stuffs are supplied by a depot started with the company's help. The rubber produced is exported to foreign countries *via* Alwaye.

This estate is managed by Mr. A. W. Knight and has 680 acres of reserve forest land besides 72 acres of waste lands and jungle sites.

Malankara Estate.—This estate is situated to the south of Thodupuzha town and is 37 miles away from Alwaye. Besides rubber plantations, pepper, cardamoms and ginger are also cultivated. The products are exported to Cochin *via* Alwaye. The wages of a skilled artisan in the estate are 12 As. a day. The average cost of living for such a person is Rs. 15 a month, cooly wages come from 4 to 6 As. a day. Coffee plantations are found to a small extent, but these are not large or very profitable.

The estate is under the efficient management of Mr. P. John and has an extensive plantation of rubber extending over 1600 acres. There are 483 acres of reserve forest land for expansion and fuel purposes. The estate is a good one.

Mar Thama Estate.—This extends over 246 acres of cultivated land 43·4 acres of reserve forest land. It is managed by Mr. M. K. Kuncharia and is Indian owned.

Cardamom.—Small plantations of cardamoms are found near rubber estates and the produce is usually exported.

Coffee.—As in the case of cardamoms, coffee is also cultivated near the estates. No large quantity of it is produced and it is simply for local use.

Reeds and Bamboos.—Reeds and bamboos are found in large amount in all parts of the taluk, but more especially near the rivers. Local basket makers cut them down for making baskets. It is possible, that, from this area paper-pulp material could be obtained in quantity.

Rattans.—Rattans are obtained in the taluk but most of them are taken out to other taluks to be worked into baskets etc., Mulakulam and the places as far as Kottayam are supplied from here. Rattan workers are found in the taluk.

Other products.—Plantains, arecanuts, grams, peas and others are cultivated in the taluk mainly for local purposes.

Trees.—Most of the forest trees, jack, mango, tamarind, etc., are found in the taluk to a large extent.

Minerals.

Mica.—Mica is found near Kuninji, but this has not been fully investigated.

Graphite.—Graphite deposits are found in villages near the Muvattupuzha-Thodupuzha road, and also in Vazhakulam and are of good quality. Investigations have to be made regarding these deposits.

Clay.—Clay of good quality exists in Kumramangalam pakuthy, and formerly glazed jars were made there. There is no reason why this should not be revived.

Existing Industries.

Agriculture.—Paddy cultivation is the main occupation of the people. The total area under paddy is 8815 acres.

The major portion of the taluk is hilly. More than 25,000 persons follow agriculture as their profession and besides paddy, sugarcane, lemon-grass, tapioca and other things are cultivated. There are about 50 land-lords in the taluk and their average monthly income is Rs. 75. The agricultural labourers receive 8 Chs. as their daily wages. The cost of living for a person in the taluk, would be Rs. 6 a month. Generally the agricultural labourers pay no rental to land-lords but render personal service in lieu thereof.

The prospects of rubber cultivation in this taluk are very great and are being taken advantage of. The prospects for sugar cultivation are also good, and besides the 1000 acres granted by Government for this purpose, there is plenty of scope for further expansion. If a sugar mill is to work successfully this expansion is an essential. The agricultural prospects of the taluk are good and new developments can easily be made.

Cocconut Industries.—The area under cocconut cultivation is 6022 acres, and most of the coconuts are consumed locally. Copra-making is carried on to a small extent by a few people and the copra is exported to Cochin. The coir industry is not carried on in the taluk for want of soaking facilities. The taluk is not an important cocconut producing area.

Pottery.—In Kumaramangalam pakuthy glazed pottery for local purposes was formerly made by local potters. The craft is now defunct. There are still a few potters in this pakuthy, who make ordinary pots for the supply of local needs, but they are only the crude variety.

Bamboo Mats and Baskets.—Some thousands of bamboo and basket makers are found in the taluk. They are mostly coolies engaged in other pursuits, who do this as a cottage industry. The women of the family are engaged in the work during the day, and the men usually finish up the mats. They get the reeds and bamboos from the neighbouring forests, and these are cut by the workers themselves. The baskets and mats are bought by the merchants in the local bazaars, and supplied in quantity to merchants in Alwaye for export. The average earning of a mat-maker is Rs. 3 a month. The question of the expansion of this industry is of importance, and a depot would greatly help.

Weaving.—A few isolated weavers live in different parts of the taluk. They supply local demands in towels and

inferior cloths. There is no weaving community and little scope for development.

Jaggery.—Jaggery making is carried on by several people in the taluk. The crushed cane exudes the juice. This is boiled in copper vats, and allowed to solidify in rectangular wooden tube. The jaggery fetches a high price locally, and is of good quality. Large quantities of it are exported to Cochin and other places. The high price of jaggery here makes it difficult for a sugar refinery to work. Nevertheless, increased cultivation would lower the price and render the sugar industry more likely to succeed.

Lemon-Grass-Oil.—Distillation of lemon-grass is an important industry in the taluk. Many thousand bottles are annually exported to Alwaye and Cochin. Even though this industry has declined on account of the low price of the oil, it can be revived if the oil is purified in some central place, and an agency is established for the collection of the crude product.

Possible Industries.

Rubber.—This has already been discussed in detail. Rubber cultivation could be made more extensive. There are many acres of land fit for rubber cultivation. One point however, must be emphasised and that is the tendency of small rubber compounds to become breeding grounds for disease. The rubber tree is particularly susceptible to pests of all kinds, and the small and often ignorant ryot does not detect the 'malady' of his trees. If he does, it often occurs that he is not willing or able to sustain the loss by cutting down a tree. It is thus a necessary precaution, that expert supervision of small plantations should be exercised so as to eliminate any chance of the industry becoming impossible owing to disease of the trees.

Sugar.—Increased cultivation of sugar cane should be encouraged and jaggery-making established to a larger extent. This would supply raw material for the Ettumanur sugar factory or one that may be established near Alwaye.

Sericulture.—Attempts could be made to rear silk-worms in the taluk, since mulberry trees grow well. This could be taken up as a cottage industry.

Tapioca.—More extensive cultivation of tapioca could be begun in the taluk, and the raw material used to supply the purpose of a factory for the preparation of tapioca and

arrowroot flour at Alwaye. This has already been dealt with in detail in this and other reports as well as our Bulletin.

Paper Manufacture.—The bamboos and reeds found in the taluk can be utilised for paper-pulp manufacture. If a factory be established in Alwaye, the raw materials could partially be supplied from the forests of this taluk. There is insufficient quantity of soft wood here to start a local paper mill, as the supply would soon be exhausted. The forests are not extensive enough to supply a factory at Alwaye, other districts could also contribute their quota, and the resulting total supply would be sufficient to justify the enterprise. Soft wood is also found in large quantity in the taluk, and probably this could also be utilised.

Resin.—The Travancore Pine (*Vateria Indica*) is found in quantity in the taluk. The resin from the tree can be collected by systematic tapping. This is a valuable material for varnish industry. The oil from the seeds, known as vegetable butter, can be used for soaps, candles, etc.

Foodstuffs available and used locally.—Rice, tapioca, yams, plantains, peas, and other vegetables. Fish is also used largely.

Economic Statistics.

The agriculturalists form the major portion of the working population, and number 20,000. Skilled workmen in other crafts can be estimated at 2000.

Carpenters	300	Earn 8 As. a day.
Masons	450	„ 7 to 8 As. a day.
Blacksmiths	Very few	Contract work or 12 As. a day.

Mat-Makers Some thousand Rs. 3 a month for spare time work.

Weavers	Very few	Rs. 4 to Rs. 5 a month.
Coolies	Some thousand	6 to 8 Chs. a day.

Professional men including Vakils, Teachers, Vaidyans and other servants. 300.

Cost of living.—Cultivator's family. Rs. 20 to Rs. 25 per mensem.

Cooly's	„	Rs. 5 to Rs. 6 per mensem.

Single person (middle class) Rs. 7 to 8 per mensem.

Number in a family.—Cultivator's family.—5 on the average.
Cooly's family.—4 on the average.
Number of Voters.—58.

Co-Operation.

No co-operative society exists in the taluk.

Joint-Stock Companies.

The Rama Varma Plantain Industrial Co., Ltd., Thodupuzha. Rs. 150,000.

Capital and Remarks.

Up to the end of 1922, there was no co-operative capital collected in the taluk, and the value of co-operation has not been realised by the people. The total joint-stock capital is 1½ lakhs of rupees, but this is invested only in one concern. More companies could be started for lemon-grass cultivation, rubber plantation etc., and investors could be found. This taluk should concentrate on sugar, rubber, tapioca, and Lemon-grass-oil, and these will be successful.

KUNNATNAD TALUK.

Area.—293·88 Sq. miles. *Population.* 1,11,690.
No. of Houses.—23,800. *No. of Voters.*—107.
No. of Pakuthies.—14. *Taluk Town.*—Perumpavur.

Location.

Division.—This taluk is situated in the north of the Kottayam Division and is one of the northern most taluks of Travancore.

Boundaries —**NORTH.**—The Chalakudi River divides the taluk from Cochin Territory.

SOUTH.—Cochin Territory and Muvattupuzha Taluk.

EAST.—Muvattupuzha Taluk.

WEST.—Alangad Taluk.

Railway.—The taluk is not touched by any railway. The nearest railway station is at Alwaye, 10 miles from Perumbavoor town. There is a good road to Alwaye and the Periyar river comes within two miles of Perumbavoor town.

Backwaters.—This taluk is an inland one and is not touched by backwater. The Chalakudi river forms the northern boundary of the taluk and is navigable for small vallams in dry season and large vallams in rainy season. The Periyar cuts the taluk into two unequal portions the

smaller being the northern. It is navigable for vallams throughout the year. The Muvattupuzha river touches the taluk at the south-eastern portion for a few miles and this bends down south.

Main Roads and Village Roads.—The main central road enters the taluk in Mazhavannur Pakuthy and cuts right across en-route to Trichur, leaving the taluk near Chengamanad. The road passes through Perumpavoor. This town is the meeting point of two other roads; one from Alwaye and the other from Kothamangalam. Village roads are found in a satisfactory condition. The Puthencruz road runs south of Perumpavoor, and at the southern extremity a branch of it runs east to Muvattupuzha. A little to the north of Perumpavoor, a branch of the main central road goes to Malayattur. These roads are all cartable, but a bridge on the Malayattur road would improve matters greatly on the whole. The taluk is well served by road communications.

Cultivation.

Wet land area,—45,411 acres. Dry land area,—53,669 acres
Cocoanut area.—550 acres.

Pakuthies.

Name of Pakuthy.	Area. Sq. miles.	Popula- tion. Persons.	Wet land. Acres.	Dry land. Acres.
Vengoor ...	29.61	8000	4255	3461
Cheranallur ...	14.18	9000	3329	3367
Perumpavur ...	10.78	...	3197	2618
Vengola ...	13.74	7000	3332	4202
Asamannur ..	8.28	5700	2067	1755
Rayamangalam ...	11.53	...	2847	3191
Malavannur ...	18.98	15000	3898	5024
Aikaranadu ...	19.67	13390	3916	8016
Semmannadu ...	21.67	13000	4253	7336
Kunnatnad ...	11.48	10000	2678	463
Kalukkambalam ...	11.12	...	3165	3184
Vazhakulam ...	7.61	...	2015	1894
Manikkamangalam ...	28.27	7370	2990	1760
Manjappira ...	79.00	...	3463	3663

Education**GOVERNMENT BOYS' VERNACULAR SCHOOLS.**

No. of H. G. Schools.	7.	No. of Boys.	1365.
		No. of Girls	156.
No. of L. G. Schools.	28.	No. of Boys.	3037.
		No. of Girls.	1096.

AIDED.

No. of L. G. Schools.	10.	No. of Boys.	770.
		No. of Girls,	184

PARTIALLY RECOGNISED SCHOOLS.

No. of Schools.	14.	No. of Pupils,	674.

GIRLS' VERNACULAR SCHOOLS.**GOVERNMENT GIRLS' VERNACULAR SCHOOLS.**

Name of School.	Grade.	No. of Classes.	No. of Girls.
Edapalli.	H. G.	7	236
Oornakod.	L. G.	4	40
Mazhuvannoor.	L. G.	2	55
Perumpavoor.	L. G.	...	150
Koovapadi.	L. G.	3	58

BOYS' AND GIRLS' ENGLISH SCHOOLS.

L. G. English School, Perumpavoor.	3 Classes.	No. of Boys.	103	No of Girls.	3
Swarnath L. G. English School, Kazhukkambalam.	2 ...	...	...	...	2

INDUSTRIAL SCHOOLS.

No Industrial Schools are found in the Taluk.

Natural Products and their utilisation.

Paddy and rice.—The main product of cultivation in the taluk is paddy. Approximately 45,400 acres of land are under paddy cultivation. The major portion of it is single cropped, only about 6 % of the area being double cropped. The paddy is grown enough for the local needs whilst some is also exported to Cochin State and other taluks of Travancore.

Cocoanut.—This taluk is not a large cocoanut producing area. Approximately one lakh of trees is found in the taluk but the produce of each tree is not equal to that of Shertalai, Vaikom and similar places. Cocoanut produce in the taluk is sufficient only for local needs and there is very little export carried on from the taluk. Each compound contains a few cocoanut trees and the produce of these is used by the owner.

Tapioca.—Tapioca is grown in all parts of the taluk and most of it is consumed locally. A small portion of it is sent to Angamalai, Alwaye and other places. Dried tapioca is exported to Cochin and other places in small quantities. By growing more tapioca on the many waste lands found in the taluk, the output may be increased. The soil is very suitable for tapioca cultivation. Rats are a great trouble to tapioca cultivators as has already been pointed out in Alengad Taluk report. The best place for a tapioca factory is near Alwaye on the river side. There are small hillocks in the neighbourhood of the Periyar where the factory could be established. The water supply will not be a serious problem.

Arrow-root.—Arrowroot grows wild throughout the taluk, but very little notice is taken of it. Some people carry on the preparation of arrowroot flour in the neighbourhood of Perumpavoor, and sell it in the local market. The annual export of the flour may be estimated approximately at 4 candies. The flour is chiefly exported to Cochin. It is prepared entirely by hand and with no appliances other than ordinary culinary utensils.

Lemon-Grass.—One large plantation of lemon grass existed in this taluk. Lemon-grass distillation was formerly carried on as a cottage industry by the people. The distillation is still going on in the neighbourhood of Malayattur, where grass grows wild and no cultivation is necessary. No difficulty will be experienced in organising the revival of

the industry. The majority of the grass is now untouched by the people as they have no assured market for the oil. There are more than 3000 acres of dry land under lemon grass cultivation, and more could be added to the present acreage. An approximate estimate showed that more than 5000 acres of land, which is now lying waste could be so cultivated. Hundreds of gallons of oil are exported to Alwaye annually. The old method of distillation is used, and in consequence the oil is crude. Nevertheless, the percentage of citrol is very high and almost double that of the oil from Central Travancore. There is a good demand for pure oil, and if a redistillation apparatus was installed, the future of the industry would be very great. Bulletin No. 6 of this department sets this out in full. The industry should certainly be investigated and encouraged.

Sugar-cane.—Sugar-cane was cultivated largely in the taluk on the banks of the Periyar and the Chalakudi rivers. The cultivation has decreased considerably, and the people have taken up to other professions. Several hundreds of acres of land can be profitably brought under sugarcane cultivation. The people of the taluk are not rich and want of floating capital is the chief cause of the decline of the industry. The increase of cultivation should be encouraged as it would justify the existence of a mill in the district. Raw material is badly needed for the Ettumanur mill.

Plantains.—Banana and plantains are cultivated largely in almost all parts of the taluk. Large plantations of banana trees are found in almost all the pakuthies. The cultivators get good profits out of the fruit but disregard entirely the value of the fibre. Plantain-fibre extractors should be introduced, and the fibre collected and placed on the market. Plantain-flour and preserve could also be made.

Pepper.—The pepper vine is cultivated to a large extent in the taluk, and the soil is highly suitable for its growth. More than 200 candies of dried pepper are exported from this taluk to Cochin annually.

Marottie.—Marottie trees are found in large numbers in the taluk. The seeds are collected and dried, and sold in the markets for export. The oil is not expressed locally.

Nuxvomica.—Nuxvomica is grown in the forest parts of the taluk, the seeds being exported by rail from Angamali. This taluk is rich in forest produce.

Bamboos and reeds.—These form the important forest produce of the taluk. They are exported from Malayattur by the Periyar river. Five lakhs of reed are exported annually from Malayattur under the permit system, but more are available. An annual supply of 2000 tons of reeds can be obtained. Bamboos are also obtained, but are now used only for floating purposes. Five hundred tons of bamboo can be cut down annually from the forests, without any fear of failure. The question of utilising these products for paper manufacture, has been fully stated in the report on Alangad Taluk.

Black-Dammer.—Black-dammer and white-dammer are obtained in large quantity from the forests, and are not sold in auction. The present method of collection is carried on by forest dwellers in a crude way. A system of scientific tapping might be introduced so that, better products could be obtained, and a more scientific utilisation of the products be developed. The manufacture of varnish and sealing-wax could be begun here with the dammer. There is a great local demand for both articles.

Sappan wood.—Small quantities of this dyestuff are obtained from the forests and also from the compounds. The demand for this wood from merchants in Cochin, has induced the people to cut it away from their compounds and sell it. Most of the existing trees have thus been felled, and no attempt to replant them has been made. This is a great pity, since the sappan yields a valuable dyestuff for coir and other fibres.

Other products.—Chamai, gingelley, grams and peas, yams of various kinds, vegetables are all minor products. They are cultivated chiefly for local consumption.

Trees and Timber.—Rose-wood, Teak, Anjili, Jack and other common trees are all found in the taluk, mostly in the forests. Soft woods are also available largely from the forests. These might be used for paper-pulp-making. The forest wealth is largely uninvestigated.

Minerals.

Mica.—A deposit of biotite mica has been noted in a well near the Taluk Office, and also in a neighbouring well, at a depth of 20 to 30 feet.

Graphite.—Graphite has been noticed in a tank in Vengola pakuthy, at a depth of 20 ft. but this has not been fully investigated.

Iron ore.—Formerly Iron smelting was carried on in the taluk. Locally obtained ore was taken, smelted in small furnaces, and then used by the blacksmiths. Remains of such foundaries are even now found near Perumpavoor and in Vengola Pakuthy. The extent of the deposit is not known and needs further investigation.

Existing Industries.

Agriculture.—Agriculture is the main industry of the people in this taluk. Paddy cultivation is carried on over an area of 45,400 acres, and most of it is single cropped. Many of the people are small landowners as well as agriculturists, including the agricultural labourers. The number of skilled workmen may be approximately stated as 35,000. The average daily earning of a labourer is 8 chs. and for about 20 days a month, he is in full work. When the labour for the year in paddy fields is over, the people do cooly work, and also cultivate their compounds to produce other kinds of grains, yams, and vegetables for home consumption. Thus these labourers find enough work through-out the year to enable them to maintain themselves. The number of rich landlords is limited and in the majority of cases, they leave the cultivation in the hands of the tenants. Greater interest in land improvement by the landlords would be very beneficial. The tenant has generally no capital to invest in making improvements in the method of cultivation. The average income of some of the richest landlords in the taluk may be estimated at Rs. 4000/- per annum. The small landowner has very little ready money, and cannot carry out many improved methods of cultivation. The average income of a cultivator's family is Rs. 30/- per mensem, and this is barely sufficient for the family expenditure.

Cocoanut Industries.—As has already been stated, coconut cultivation is carried on only on a small scale, and coconut industries are not developed to any degree in consequence. Copra-making is carried on in two of the pakuthies, namely, Cheranallur and Malavannur, and the products are exported to Cochin. Coir-making is not a successful industry owing to the want of soaking facilities. The husks are now used as fuel. The introduction of coir extractors will enable the people to utilise the raw material at present wasted.

Lemon-Grass-Oil.—A few stills are found in the taluk, where the oil is extracted from the grass. Near Malayattur, three or four stills are working. They are profitable for two reasons :—(1) the grass is cut from the forest and only a small price is paid for it. (2) the necessary fuel is obtained from the forests and costs but little. Improved and extended cultivation in the plains will revive the industry, as the market is assured for the product. The establishment of a refinery in Alwaye or some neighbouring place would be profitable. At present, all the crude oil goes to Alwaye for export. It has been observed that the oil from this and the neighbouring taluks contains more citrol than from Central Travancore and is, therefore, more valuable.

Bamboo mats and Baskets.—It has been noted already, that the taluk abounds in reeds and bamboos, and a large quantity of them is exported. Bamboo mat and basket-making forms a means for occupation of more than two thousand people, mostly pulayas by caste. The industry is not organised, but is worked individually on a cottage basis. Each-basket-maker takes his product to the market, and sells his goods at rates varying according to demands. The export trade is carried on to Alwaye and other neighbouring places. New patterns of mats and baskets could be introduced, more modern methods taught, and wider and better markets found for the goods. Rattan-makers are also found in some places. It is only a small industry, but it can be developed. Cottage industries need improvement and organisation and a depot would help greatly.

Jaggery-making.—Sugar-cane is crushed in bullock-driven mills, and the expressed juice is boiled in the ordinary way for making jaggery. It is carried on in a small scale in Aiykaranadu, and the jaggery is exported to the neighbouring places. More cultivation could be encouraged in this taluk, and also in Muvattupuzha and Thodupuzha. A sugar factory could be worked successfully in North Travancore.

Possible Industries.

Tapioca flour, Arrowroot flour and Banana flour.—A flour mill may be established either in this taluk, or preferably in the neighbourhood of Alwaye. This can be utilised in the preparation of flour from tapioca, banana and arrowroot, all of which are found to large extent in the

taluk. The best site for the mill is on the river side, so that, there will be no difficulty in obtaining pure water.

Plantain fibre.—Fibre extractors may be introduced both for plantain fibre and for coir in this taluk. This industry can be carried on in a small cottage scale, but a central depot for the collection, sorting and chemical treatment of the fibre is essential.

Hides and skins.—More than 200 raw hides are exported to Alwaye every month. Tanning materials are collected from the forest, and exported from Angamali. A tannery for North Travancore, can be established in Angamali or Alwaye with advantage. Good water facilities exist in both places. Sites for the factory will be cheaper in Angamali than in Alwaye.

Bamboo work.—Chairs, tables and other things can be made out of bamboo. This could easily be established as a cottage industry in the taluk. Instruction would be necessary, and a school established at Alwaye, for giving instruction in bamboo work, along with basket-making, would satisfy all requirements. This has been fully discussed in Alan-gad report.

Economic Statistics.

There are over 2,000 skilled artisans in the taluk, other than agricultural labourers. Over 20,000 agricultural labourers are found in the taluk. A rough division of the craftsmen is as follows :—

Name of craft.	No. of workmen.	Daily wages.
Carpenters	160	8 to 10 As. a day, works for 20 days in a month.
Masons	500	8 As. a day.
Blacksmiths	30	Contract work, earns 12 4s. a day.
Basket weavers	about 2,000	4 to 5 As. a day.
Coolies	Some thousands.	8 Chs. a day.

Cost of living.—Cultivator's family. Rs. 25 to Rs. 30
per mensem.

Cooly's family. Rs. 7 to Rs. 8 per mensem.

Single person. Rs. 8 to Rs. 10 per mensem.

Number in Family.—Cultivator's family. 6 to 7
persons.

Cooly's family. 4 to 5 persons.

No. of Voters. 107. No. of Professional people,
(Vakils, teachers, etc.) Some hundreds.

Co-operation.

No co-operative societies were formed in the taluk up to the end of 1092.

Joint Stock Companies.

The Sri Ratnam Co., Ltd., Kunnatnad. Rs. 15,000.

Capital and Remarks.

There was no co-operative capital in the taluk at the end of 1092. The total Joint-Stock Capital was Rs. 15,000. Capitalists are few but with difficulty a sum of about Rs. 10,000 could be collected, if money was released from landed property.

VAIKOM TALUK.

Area. 139.55 Sq. miles. Population. 1,21,790.

No. of Houses. 27,500. No. of Voters. 197.

No. of Pakuthies. 16. Taluk Town. Vaikom.

Location.

Division.—This taluk is situated in the middle of Kot-tayam Division.

Boundaries. NORTH.—Cochin Territory. The Muvat-tupuzha river runs near the Northern Boundary.

SOUTH.—Ettumanur Taluk.

EAST.—Ettumanur Taluk.

WEST.—Shertalay Taluk.

Railway.—No railway runs through the taluk. The nearest railway station is Ernakulam, which is 21 miles from Vaikom and reached entirely by backwater. Daily services of Motor and Steam boats run direct to Cochin, and Alleppey and there are also night boats running regularly to the same places.

Backwaters and Rivers.—The Vembanad lake runs through the taluk dividing it into two unequal parts. The smaller portion is a narrow strip of land on the western side of the lake.

The Muvattupuzha river has its mouth into the lake in the northern portion of the taluk. There is a delta formation at the mouth, known as Maravanthuruthu. The river is navigable for small vallams in all seasons further up to Thodupuzha, and large vallams can go during the rainy season. The taluk is on the shores of the deep backwaters to Alleppey and Cochin.

Main roads and village roads.—A cartable road runs from Ettumanur on the north coast road, to Vaikom, and another cartable road runs right up to the north to Trippunittura and Ernakulam. Two ferries are found in the way, across the branches of the Muvattupuzha river. A village road runs from Vaikom to Kuthattukulam.

Other village roads are found in the taluk but they are only small ones mostly suitable for cart traffic. Most of the raw products are taken to the market and backwaters by headload.

Nearest Seaport.—Cochin is the nearest seaport and is 21 miles from Vaikom. Alleppey is 26 miles from Vaikom. Both the seaports are reached by vallam. Steam and Motor boats run from Cochin to Alleppey, touching Vaikom. Three services exist to each place, two in the day time and the other at night.

Cultivation.

Wet land area 25,043 acres.

Dry land area. 31,252 acres.

Cocoanut land $\frac{2}{3}$ of the whole area, Unregistered land 940 acres. Cocoanut trees. 900,000 (Approximately).

Arecanut trees. 150,000 (Approx.)

Pakuthies.

Name of Pakuthi.	Area. sq. miles.	Population. Persons.	Wet land Acres.	Dry land Acres.	Cocoanut area. Acres.
Vaikom ...	9.82	6560	659	1044	341
Neduvila ...	5.12	7840	895	900	600
Pallipuram ...	6.71	7840	1120	2335	1728
Thycattuchery ...	4.94	5180	1142	1387	1215
Kulasekaramanga- lam ...	4.40	10770	581	364	150
Vadakemuri ...	3.08	4800	601	566	356
Padinjaraikkara ...	3.09	3520	1087	478	394
Panavalli ...	6.18	8650	1230	1694	1363
Vadutalamattat- tibagam ...	8.68	9230	900	1779	893
Manakkunnam ...	11.45	10250	1297	1946	811
Chembumuri ...	8.04	6750	1553	1471	1008
Maravanturuthu ...	2.41	3450	638	690	664
Vadayar ...	16.93	12360	3516	5008	4261
Mulakkulam ...	13.94	9120	1402	6510	5916
Tal iyalam ...	17.44	9170	4211	4088	5185
Vetchur ...	12.97	6280	4206	987	650

Education.**GOVERNMENT VERNACULAR SCHOOLS.**

No. of H. G. Schools.	10.	No. of boys.	2787
		No. of girls.	313
No. of L. G. Schools	24	No. of boys.	2554
		No. of girls.	841

AIDED VERNACULAR SCHOOLS.

No. of H. G. Schools,	2.	No. of boys,	363.	No. of girls,	77.
No. of L. G. Schools.	12.	„	1095.	„	257.

UN-AIDED.

No. of Schools.	28.	Strength.	1308.

GOVERNMENT VERNACULAR GIRLS' SCHOOLS.

Name of School.	Grade.	No. of Classes.	No. of Girls.
Vaikom (Departmental)...	H. G.	7	347
Mulakulam "	L. G.	3	71
Perumpalom "	L. G.	4	134
Vetchoor "	L. G.	4	69
Vadayar "	L. G.	3	100
Thrichattukulam "	L. G.	4	90
Tycattuchery "	L. G.	4	134
Vaikom St. Joseph's Con- vent ...	L. G.	3	244

ENGLISH SCHOOLS.

H. G. English School, Vaikom. 6 Classes.	No. of boys. 657	No. of girls. 17
S. M. L. G., English School, Thycattuchery. 3	" " 122	" " 6
There are no girls' English Schools in this Taluk.		

INDUSTRIAL SCHOOLS.

	Strength.	Staff.	Subject.
Thycattuchery Aided Industrial School.	114	2 Teachers.	Coir Indus. try-

Natural products and their present utilisation.

Paddy and Rice.—There are roughly 25,000 acres of paddy land in the taluk. All of these are single cropped. The paddy is grown both for local consumption and export to other taluks, such as Shertalay where paddy land is scarce. Export to Cochin was also carried on. People find land near the backwaters more profitable for cocoanut cultivation, and sometimes the full extent of the paddy land is not cultivated.

Cocoanut products.—This is a great cocoanut growing taluk, and stands fourth in the State. The number of cocoanut trees can be roughly estimated at about 6 lakhs, and more areas are brought under cocoanut annually. Roughly 50% of the total area is under cocoanut cultivation. Coir-making is carried on as a large cottage industry, as the soaking facilities

are good. The western portion of the taluk is the main coconut area, and the good facilities of transport by vallam of coir yarn and fibre direct to the ports, greatly assist the trade. Copra-making is also a big industry in the taluk. Oil-pressing is also done locally, and there is also a power-driven oil mill at Vaduthalamadathilbhagom, near Arukutty.

Tapioca.—In the eastern pakuthies of the taluk, tapioca is grown largely. It is an important article of food among the lower classes of people. A large quantity of the dried root is exported to Cochin, Shertalay and other places. More extensive and intensive cultivation of this material could be done, and if a factory were established near Kottayam or Ettumanur, the surplus production could be utilised.

Arrow-root.—In most of the pakuthies arrow-root grows wild, but little care is taken of it. Few people make it into flour in houses, and sell it in the local markets for a low price. The true value of the material is not known to the public, and consequently much of it is lost. A flour mill established for tapioca could also utilise this material.

Ginger.—This is cultivated mostly in gardens but large plantations are also found in Mulakulam pakuthy, where it is cultivated in quantity. It is dried and exported to Cochin. No attempt to preserve it has been made.

Turmeric.—This is also one of the plants cultivated throughout the western pakuthies. No very large plantations are found, but many ryots grow a little of it. The material not used locally, is dried and exported to Alleppey and Cochin.

Plantains.—Fairly large plantations for the cultivation of this fruit are found in a few of the western pakuthies, but almost every house has its own small garden. Most of the produce is consumed locally, since Vaikam Temple is a place where big feasts are given. The leaf as well as the fruit is used for culinary purposes. Plantain fibre extractors can be introduced, and the fibre extracted for purposes of weaving and export.

Screw-Pine.—This plant is grown as the hedges of compounds and fields in many parts of the taluk. The leaves are used for mat-making. The mats are made in the cottages and offered for sale in the local markets to merchants who collect them. The rougher varieties are usually made.

There might be a great development of this industry if a co-operative depot was established.

Pepper.—Pepper-vine is cultivated specially in Chembu-muri and Manakunnam. Pepper is dried and exported to Cochin and other places. Formerly, this was a great centre for pepper cultivation.

Indigo—Indigo plant is grown on a small scale in Panavalli pakuthy. It is used locally.

Other Products.—Among other products grown for local consumption may be mentioned, gingelly, peas, pine apple, yams, and vegetables.

Trees.—The common trees such as the mango, jack, angili, tamarind, pala, kanjiram, cashewnut etc., are all found, and are used locally for timber and firewood. Pinnay oil-tree, Marottie, Travancore Pine, Karinjotta and Odam are scattered about the taluk, and are used both for wood and for their oil-seeds. The oils are pressed in local mills and are utilised for burning. Karinjotta wood is used for making sandals which are sold locally. The soft woods mentioned above can be utilised for match sticks and pencils. The trees are not in forests but scattered throughout the taluk.

Minerals.

No minerals of note have been yet discovered. Good clay for pottery is found in the eastern part of the taluk. Potters supply the local needs of the taluk in pottery.

Existing Industries.

Agricultural.—The main occupation of the people is agriculture. The important products of cultivation are paddy and cocoanut. There are about 20,500 acres of paddy land and all of these are single cropped. About 25,000 men are engaged in agriculture as skilled agricultural workmen. Many of them are small land-owners also, and they work on their own land. The average income of a land-owner may be estimated at Rs. 300. His expenses run up to this amount. In general he has little or no capital to invest on improvement of agricultural methods.

A system of supplying manure and other essentials to land-owners on loan, and recouping the amount after the crops along with the tax, will greatly improve the

agricultural income of the ryots, as well as the fertility of the soil.

The average wages of an agricultural cooly are from 8 Chs. to 10 Chs. according to skill. The cost of living for a cooly family is more than this sum, but in most cases the wife and grown-up children also earn smaller wages to add to the family income. These people live in houses built in their landlords' compounds free of rent, in return for services as watchers of the compound. Often the produce of one cocoanut tree is also given.

Cocoanut Industries.—*Copra.*—Copra-making is one of the major industries of the taluk. There are over 5 lakhs of cocoanut trees, and most of the cocoanuts are dried for copra. Many tons of copra are exported to Cochin, even though there is an oil mill in Vaduthalamattathilbhagam. There is scope for another mill in the taluk. About 400 persons or more, are actually engaged in copra-making. The average earning of a copra-maker may be roughly estimated at Rs. 40 per mensem, excluding the interest on the capital invested. The method of copra-making is carried on in the old way. No attention has been made to work the industry on any modern scientific method. The introduction of artificial beating arrangements, cleanliness in making the copra should be noted so that a better product is obtained. This industry can be greatly improved in the State by investigating the question, and instructing the people in more scientific methods.

Coir-making.—This is carried on in the taluk mainly as a cottage industry. The low class women earn a small income of Rs. 4 to Rs. 5 per mensem, by the industry. Some people use the "Rautt" machine, but the majority follow the old methods. The establishment of coir-extractors will improve the sanitary condition of the taluk, as most of the taluk are now used for soaking the husks. The soaking facilities of the taluk are good. A coir mill to which coir extractors are attached would be a good and profitable concern in the taluk. These might well be attached to the existing oil mills which are power-driven. Brush-making from the whisk produced might be introduced.

There is one industrial school in Thycattuchery, where coir industries, such as coir making etc., are taught. The strength of the school is 114. Government give aid to this institution.

Coir fibre is exported in large quantity from the taluk to Cochin and Alleppey. Some thousands of people are engaged in the industry. They are mostly uneducated.

Oil pressing.—There is one oil-mill in the taluk, and oil-pressing is also carried on as a cottage industry by bullock driven presses. The approximate number of such presses may be estimated at 300. The oil is sold locally. Soap-making could be introduced here, in a small factory.

Mat-making.—Screw-pine mats are made by low caste men and women for local sale. Superior qualities are not made in quantity in the taluk. A great number of persons follow this industry as a subsidiary one to agriculture and the spare hours of the workers are used for the purpose. There is no organised industry and the prices gained are unsteady and variable. Three to four rupees per mensem can be earned by a mat-maker for his leisure work. Grass mats are also made in the taluk. The grass is grown in the tanks, but the industry is a small one.

Basket-making.—Basket-making is carried on on a small scale by the Pulavas. They are generally agricultural labourers, but most of them utilise their spare hours in this manner. The baskets are sold in the local bazaars, and the price varies according to size from 3 chs. to 8 chs. The average earning of a basket maker, working full time, is about Rs. 5. Bamboo mats are also made in small quantity for local use. Bamboos grow in the eastern parts of the taluk and are cut down by the basket-makers themselves for this purpose. No depots where bamboos are collected and sold, are found in the taluk and the industry is just a scattered one with no central organisation.

Bronze-work.—There are a few bronze workers in Vadayaru pakuthy who supply the local needs of the people. The average earning of a bronze worker is Rs. 12 per mensem. They make chiefly local culinary articles.

Pottery-work.—Clay suitable for pottery work is found in the eastern portions of the taluk. About 300 potters work at the industry, and they supply the local needs. The average earning of a potter may be estimated at from Rs. 6 to Rs. 8. Pots are carried to markets by headloads. There is also export of pottery to the neighbouring taluks.

Weaving.—Small towels, under-clothing and other inferior cloths are made by a few weavers scattered about the

taluk. They are nearly all working in or near Vycome town, and the manufactured articles are sold in the local bazaars. The yarn is bought at Alleppey, or Cochin. There are no yarn merchants in the taluk.

Fishery.—All round the lake there are hundreds of fishermen. They live in small huts, and their condition is very poor. They belong to a separate caste. The method of fishing is to fix stakes in the backwaters, for which they pay Rs. 3/8 per year as license fee. They are then allowed to fish near these staked areas. The income derived from this is uncertain and small. A typical case may be given. Fishing for three hours in the day, a fisherman caught one chuckram worth of fish. He stated that his usual catch was 4 or 5 chs. worth of fish per day. In addition to this, he earned some chuckrams by taking people across the ferry, from Vycome to Pallipuram. On an average he earned 7ch. a day. He lived on fish, tapioca, and rice. He borrowed from a shop-keeper on days when he did not, or could not, work, or failed to get enough for his food. The condition of these fishermen is very miserable. The fish caught is entirely consumed locally.

Vallam making.—There are a good many carpenters in the taluk. The majority of them are skilled and engaged in making big Vallams. The wages of such a skilled carpenter are 8 As. per day, and he would work on the average for 20 to 25 days in a month. He usually renders personal service to a landlord in lieu of rent for his house.

Sandals.—A few carpenters are engaged in making sandals as a regular calling. An average workman earns 12 As. per day by this craft. The cost of the wood is very little, and the best variety for the purpose is found to be Karin-jotta. This is grown largely in the taluk, and is simply cut for use. The sandal-maker takes the rough hewn branches, and cuts them to the necessary shape, whilst the wood is wet and unseasoned. It is a white grained wood and should be suitable for pencils and matches.

Possible Industries.

Coir industry.—A coir factory could be established with advantage. The making of coir soles for shoes and sandals could be taught as a cottage industry, and followed with success.

Plantain fibre industry.—This industry should thrive well in the taluk. Fibre-extracting machines should be introduced, and the extraction done as a cottage industry. A central depot for fibre collection, softening and spinning would be necessary. The local weavers should be instructed to make plantain-fibre handkerchiefs, cloths, etc., and fibre could also be exported. This would be a more profitable industry than the present one, for the small weaving community of the taluk.

Tile manufacture.—The question of starting a tile-factory has been investigated. It is probable, that a factory nearer Ettumanur would pay best as better facilities for firewood, etc., exist there, and it is nearer the centre of the inland taluks.

Screw-pine mats & baskets.—This industry has to be organised on a cottage basis. New patterns and models may be taught and a depot established.

Soap-making.—Soap-making would be a good industry here. Water facilities for transport are good. Oil is produced in plenty and the communications for export of finished goods are quite satisfactory.

Foodstuffs available and used locally.—Rice, tapioca, vegetables, yams, cocoanut, are the main foodstuffs of the people. Fish is largely consumed by the lower classes.

Economic Statistics.

There are some hundreds of skilled workmen in the taluk. Over 25,000 people are agriculturists. In the majority of cases, the skilled artisans are in some way connected with agricultural work.

Carpenters	350 in number.	Earn 8 As. a day.
Masons	120 "	Earn 8 As. a day.
Blacksmiths	250 "	Contract work. earns 12 As. a day,
Weavers	Very few.	Earn Rs. 5 to Rs. 6 per mensem.
Basket & Mat makers,	Some hundreds.	Earn Rs. 4 on an average
Fishermen.	Some hundreds	Earn Rs. 7 to Rs. 8 per mensem.
Bronze workers.	20 families.	Contract work Rs. 10 to Rs. 15 per mensem

Cost of Living.—Cultivator's family Rs. 30 a month.

Cooly's family—Rs. 5 to Rs. 7 a month.

Single person (Middle class) Rs. 7 per month.

Number in Family.—Cultivator's family 6 persons on an average.

Cooly's family. 4 persons on an average.

Number of Voters. 197. No. of Professional people about 400 to 500 persons. These include Vakils, Teachers, Vaidyans, etc.

Co-operation.

There are no co-operative societies in this Taluk.

Joint stock Companies.

<i>Name of Company.</i>	<i>Registered Office.</i>	<i>Capital:</i>
The Panavalli Sri Moolam Silver Jubilee Memorial Weaving Co., Ltd.,	Panavalli.	Rs. 10,000

Capital and Remarks.

There has been little attempt up to the present amongst the people to co-operate either for capital or co-operative societies, and it is probable that very little available capital exists in the taluk. Coir is the main industry and it could be greatly developed if the people would work together and if more scientific methods were introduced. Good soaking facilities are found everywhere Soap-making might also be undertaken, as also the extraction of plantain fibre as a cottage industry. A depot might be established for this purpose

MUVATTUPUZHA TALUK.

Area—47·234 sq. miles	Population—1,24,960
No. of Houses—24,263.	No. of Voters—184..
No. of Pakuthies—12.	Taluk Town.—Muvattupuza.

Location.

Division.—It is one of the Northern taluks of Kottayam Division.

Boundaries.—NORTH,—Cochin Territory and Coimbatore District (British India)

SOUTH.—Ettumanur Taluk and Vaikom Taluk.

EAST.—Thodupuzha and Minachil Taluks.

WEST.—Kunnatnad Taluk.

Railway.—The nearest railway station is Alwaye and is 21 miles distant from Muvattupuzha. The road to Alwaye is good and well metalled.

Backwaters & Rivers—This taluk lies inland, and is not touched by the backwaters. The northern portion of the taluk is mountainous, and is traversed by the upper portion of the Periyar River and its tributaries. The Muvattupuzha river waters the middle and southern portion of the taluk. The river is navigable for the major portion of the year for big boats, but small boats can ply all the year round. The river affords direct communication with the backwaters, and thence to Alleppey or Cochin, *etc.* It joins the continuation of Vembanad Lake near Vaikom.

The main central road passes through the middle of the taluk from south to the north, entering the taluk at Kozhai in the South. Cartable roads run in various directions. The most notable are those going to Thodupuzha, Thattakaud and Puthencruz. Two cartable roads, one from Piravam and the other from Thodupuzha, meet the main central road three or four miles north of Kuthattukulam. The village roads are scarcely cartable as a rule, and the only means of transport is by headload. This is an expensive method for the produce of the taluk to reach the markets.

Nearest Seaport.—Cochin is the nearest seaport and is 33½ miles distant from Muvattupuzha. The export trade is carried on *via* Alwaye to Cochin, and also by rivers and backwaters as already indicated.

Cultivation.

Wet land area 34,050 acres. Dry land area 99,452 acres.
 Cocoonut area 1119 acres. Unregistered land 24,555 acres.
 No. of cocoonut trees 1,50,000. No. of arecanut trees
 650,000. No. of jack trees 80,000.

Pakuthies.

Name of Pakuthi.	Area.	Popu- lation.	Wet land.	Dry Land.	Cocoa- nut land.
	Sq. miles.	Per- sons.	Acres.	Acres.	Acres.
Vulavur.	17.17	11060	961	9328	172
Kuthattukulam.	17.68	9180	1734	8300	134
Tirumaradi.	19.88	12240	2797	8906	110
Piravam.	18.35	13630	2197	8478	145
Ramamangalam.	24.47	11110	3156	9670	64
Muvatrupuzha.	8.33	5120	951	3549	98
Arakkulam.	18.78	12550	2007	8869	230
Iramallur.	10.65	8220	2418	2306	17
Varapatti.	17.71	7370	2812	6283	24
Enanallur.	22.11	6660	2620	9453	43
Mulavur.	24.39	15530	4925	7142	53
Kothamangalam.	36.79	11110	4919	10060	22
Kuttamangalam.	33.33	1130	2569	7112	1

Education.**GOVERNMENT VERNACULAR SCHOOLS.**

No of H. G. Schools, 6. No. of boys, 1583. No of girls 156

No. of L. G. Schools, 28 „ 3037 „ 1099

AIDED.

No. of L. G. Schools, 10. No. of boys, 770. No. of girls, 184

PARTIALLY RECOGNISED SCHOOLS.

No. of Schools 14. Strength 674.

GOVERNMENT GIRLS' VERNACULAR SCHOOLS.

Name of School.	Grade.	No. of classes.	No. of girls.
Muvattupuzha ...	H. G.	7	275
Vayala ...	L. G.	5	70
Vadakara	L. G.	3	69
Pampakuda ...	L. G.	2	46
Arakuzha St. Joseph's (Aided).	L. G.	3	122
Kothamangalam ...	H. G.	6	182
Kuthattukulam ...	L. G.	3	73
Mamalasserri ...	L. G.	3	130
Olavoor St. John's (Aided) ...	L. G.	4	167

ENGLISH SCHOOLS.

Government L. G. E. School, Muvattupuzha. 3 Forms.
No. of boys 164. No. of girls 5

Government L. G. E. School, Kothamangalam. Pre. Class.
No. of boys 27. No. of Girls 3.

St. John's L. G. E. School, Vadakara (Unrec.) Prep. Class.
No. of boys 52. No. of girls 3.

INDUSTRIAL SCHOOLS.

There are no industrial schools in existence in the taluk.

Natural Products and their present utilisation.

Paddy.—Paddy is the chief product of the taluk. Over 34,000 acres of land are under paddy cultivation, representing nearly 60% of the total area. About one tenth of the wet area is double cropped, and the rest is all single cropped annually. The paddy grown is not only consumed locally, but is exported to the neighbouring taluks and Cochin in large quantities. This is the staple source of income for the ryots of the taluk. No power-driven mills for hulling and husking the paddy are working, or have been started, but, there is plenty of scope for one. This work is either done locally by hand, or in Cochin.

Cocoanuts.—There are about 1120 acres of cocoanut land, and 1½ lakhs of cocoanut trees. Most of the cocoanut products are consumed locally. Arakulam, Piravam, and Tirumaradi are the three important pakuthies for cocoanut cultivation. This cannot be termed a cocoanut growing taluk. Soaking facilities are few, and also the distribution of water supply etc., renders it unfavourable for the cultivator.

Arecanut.—More than 6 lakhs of trees are found in the taluk. Generally they are planted along with cocoanut on the banks of the rivers. The nut is used locally and also exported. The nuts are boiled, dried, and sent to Palghat and other places. The research work could be undertaken to discover other uses for these nuts, and if any new processes were discovered, they would be of immense value. The extraction of fibre from the arecanut would possibly be a profitable source of income. The fibre has a woollen texture and is an excellent substitute for wool in making rugs etc. The question needs development.

Tapioca.—Some hundreds of acres are under tapioca cultivation. It is the mainstay of the poorer people, and every householder cultivates it in his small compound. Besides local uses the root is sliced and dried, and exported to other parts of Travancore, and Cochin. Tapioca-flour manufacture has not been developed in the taluk. There are some hundreds of acres of unregistered land in the taluk, much of which could well be utilised for the purpose of tapioca cultivation. Even in the registered portion of the dry lands many acres which are lying fallow could be cultivated. This taluk is highly suitable for tapioca cultivation on a large scale, and if the production is increased the taluk could be made one of the main sources of supply of raw material to support a large mill for flour extraction.

Arrow-root.—Quantities of arrow-root are found growing wild in the taluk. At present the root is practically neglected and no attempt is made to collect it properly. Some people collect the root, dry it, and then export it to Cochin. Flour-making is carried on by some of the cottagers and the flour is sold in the local market for home consumption. A flour mill established for tapioca could also be utilised for the extraction of this flour. A ready Indian Market is already assured.

Sugarcane.—Sugarcane is a very important product of cultivation in the taluk. It is grown chiefly on the banks of the Muvattupuzha river. The cultivation is large at present, yet still more acres could be used for this purpose. The cane is crushed locally by bullock-driven mills with iron rollers. The crushing is done in close proximity to the cultivation. The juice is immediately boiled for the production of molasses and jaggery. The latter being allowed to set in rectangular wooden tubs. The jaggery is then exported from the place to Cochin and other places, and fetches a high price. It is said, that the high price of jaggery in this district mitigates against the success of a sugar refining industry. Sugarcane is largely cultivated in: Piravam, Iramallur, Ramamangalam and Mullavoor. The question of sugar cultivation in this taluk and also in the neighbouring taluk of Thodupuzha, is one of extreme importance. Government has already encouraged the cultivation by land concessions, and if carefully directed and guided it should be highly successful. Good reports as to the quality of the cane obtained, have been obtained from experts. A small factory such as is detailed in the Kottayam report should be established here for Rs. 7000/- to Rs. 10,000/- and would be successful. Sugar could easily be produced here in large quantities.

Lemon Grass.—Lemon grass is grown to a large extent in Muvattupuzha, Kuthattukulam, Enanallur and Iranallur, pakuthies. The cultivation covering some hundreds of acres. The lack of a market for the oil has been the cause of a diminution of the area in recent years. The oil is now extracted in the old crude way, and contains much impurity. Large quantities are exported to Alwaye, and Cochin. The demand for the oil was great, and if better methods of cultivation and oil extraction were found, the industry can be made a very flourishing one. Redistillation of the crude oil by steam, and its purification to render it economic for export of high citrol content, is necessary. The quality of the crude oil obtained from here is excellent giving up to 83 % citrol. What is necessary is, standardisation of quality, and this can best be obtained by scientific redistillation. A small factory for the redistillation of the crude oil will ensure a better and bigger demand and in consequence additional profit to the cultivator. Such redistillation could be done at some centre, such as Alleppey, or Cochin, where it could also be prepared for export.

Pepper.—Plantations of pepper vines are found in many parts of the taluk. Valam, Piravam, and Kuthattukulam pakuthies contain the largest plantations. The pepper is exported to Cochin. The cultivation is decreasing, since people find rubber plantations are more profitable. The cultivation of the pepper vine needs encouragement, and the manufacture of dried pepper could be introduced.

Other Products.—Ginger, grams, yams, plantains, thenai, varaku, etc.

Trees.—Jack, mango, cashewnut, teak; pala, elavu and puvam are some of the important trees found in the taluk.

Minerals.

Graphite.—Graphite has been found in the following places in the taluk.—

1. Near Perukalli, (2) Arur (near Kunnam), (3) Kaduvakuzhi, (4) Kuthattukulam.

Clay.—Clay for pottery is found in abundance and tile factories are working in Muvattupuzha. Glazed tiles and pottery may also be introduced with profit. There is also a large local demand for the goods.

Existing Industries.

Agriculture.—This is the main industry of the taluk. Paddy cultivation is carried on over an area of 34,000 acres, or nearly 20 % of the taluk or 60 % of the cultivated area. Many thousands of acres are under the cultivation of coconut, arecanut, tapioca and different varieties of yams and grains. Agriculture finds employment for more than 40,000 people. The small landowners number about 200, and their income is from Rs. 300 to Rs. 600 a year. In the majority of cases they are themselves skilled agriculturalists. The average income of a skilled agricultural labourer is Rs. 10 a month. His expenses amount to more than Rs. 12 a month. The deficit is met by consumption of compound produce. The cost of living for a small landowner's family is from Rs. 20 to Rs. 30 a month, thus leaving very little balance for him to make any improvements in land. Accordingly, agricultural development and improvement of methods are greatly retarded.

Cocoanut Industries.—The cocoanuts produced in the taluk are only sufficient to supply the local demands, and in

consequence cocoanut oil is imported. A few copra makers and oil pressers are found scattered about the taluk, but they can only supply a small portion of the local requirements. The coir industry is not developed in the district and the husks are usually burnt as fuel. The chief trouble mitigating against the success of this industry in the taluk, is the absence of suitable water for soaking the husks. If machines for the extraction of the fibre were introduced, the husks could be used to produce whisk, and brush-making as well as export could be carried on. This of course would be limited since the resources of the taluk are small. The process of extraction consists mainly in soaking the husks in a tank of boiling water, caused by steam, for 24 hours taking care to prevent stagnation. The extractor is then used and the coir is separated into rope coir & whisk. The former is the same as the usual type and the latter is suitable for brushes. Absolutely no waste is allowed and the husk completely used up. Such an extractor will cost from Rs. 400 to Rs. 600 if made entirely of iron.

Pottery and tile works.—Two factories for tile manufacture are found in the taluk. Local clay is used in the tile works and is found in abundance in the taluk. Roofing tiles and flooring tiles are made at the factories. The tiles find a sale both within and without the taluk, as for example, at Kunnatnad and Thodupuzha, glazed tiles, pottery, etc., could be made and would be profitable both for home use and for export. Local potters could be employed to do this. The jars are badly needed for ordinary purposes, and also for preserved ginger, preserved fruits, etc. A great number of potters are found in Enanallur, Mulavoor, and Ramamangalam. They earn Rs. 6 to Rs. 10 a month. Their mode of living is poor, and the family expenditure is from Rs. 7 to Rs. 8 a month. The deficit is often met by borrowing and by utilisation of compound produce.

Mat and Basket-making.—Bamboo and Aeta mats and baskets are made to a small extent in all the pakuthies, but in Enanallur and Muvattupuzha, this industry is carried on as a cottage industry, on a fairly large scale. There is however, no organisation for the production or sale of the goods, and the market is spasmodic and irregular. Most of the workers are employed by merchants who supply them with an advance in money, and the raw material. The finished product is taken back to the merchant who pays the balance less his interest on money lent. Thus the people have no

chance to be self-supporting or self-reliant. Co-operation cannot help until they can free themselves from these obligations to the merchants.

Jaggery.—Jaggery is made from the juice of the sugar cane. Jaggery-making is carried on, both as a cottage industry and also on a large scale near the sugar plantations. The possibility of increasing the output has already been discussed.

Weaving.—A few isolated families of weavers are found in Arakkulam, who make towels, thorthus and other kinds of cloth. The yarn is brought from Cochin in small quantities by them and the cloths made are sold in the local markets and also in Thodupuzha. There is plenty of work for local weavers, and although the scope is limited in regard to variety, yet there is a good demand for the commoner cloths. The industry is entirely local and on a cottage basis. The weavers here are living under very similar conditions to those elsewhere, namely they earn some 4 to 6 as. per day. They, however, work independently, and are also interested in agriculture, so that they are neither wholly dependent nor, entirely interested in their craft.

Bronze work.—This is a small industry carried on by a few families in Arakkulam pakuthy, and one or two people elsewhere. They work to order and by contract. The raw materials for the work are generally supplied by the customer. In some cases the artisans themselves buy them directly from Cochin, or utilise old and disused utensils which are remolten. The finished articles are sold locally. The workers are not in regular employment, and there is no organisation to help them. The work is obtained by chance and the capital possessed is small, if any at all. The same methods of working are employed as elsewhere, vide Changanachery report. The improvement of their craft is worthy of effort and consideration.

Possible Industries.

Tapioca Flour-Mill.—The preparation of arrowroot and tapioca flour, etc., can be carried on by the establishment of flour mill. The best site would probably be found on the banks of the Muvattupuzha river, near Muvattupuzha town, but it is likely that a mill at Alwaye, or Kottayam will absorb all the roots from this district. However, the place mentioned has a good water supply and is very central. The possibilities

of the industry have already been mentioned earlier in this report.

Rice-Mill.—Since this taluk is a great paddy growing area, and a large quantity of paddy is exported, a husking mill could be established in the taluk. See under “paddy”, in this report.

Mat Weaving and Basket making.—Both from bamboo and palmyra could be greatly developed here. A depot for this purpose could do useful work. The industry badly needs organisation.

Lemon grass-oil.—The provision of a still for redistillation has already been discussed.

Sugar.—The establishment of a small sugar mill is an industrial enterprise with great promise of success.

Whisk-extraction and Brush-making.—The cocoanut fibre could be extracted from the husks, and worked on a small scale if machines for extraction were available.

Grass-mat-making.—All along the rivers there are found many grasses suitable for grass-mat-making. This should be introduced as a cottage industry, and a central depot for cottage industries could take up this matter.

Sericulture.—This district is suitable for mulberry cultivation and this might be introduced with profit.

Weaving.—This could be improved so that local demands could be met by local workers, only as far as the rougher cloths are concerned.

Umbrella-making.—There are many umbrella-makers in the taluk. They make use of the leaves of the palmyra for the purpose. Match-boxes could be made out of the leaves as a cottage industry. The many grasses could possibly be utilised for match-stalks. This is a matter for research and enquiry.

Economic Statistics.

There is a large number of skilled artisans, besides agricultural labourers. These include carpenters, masons, smiths, bronze workers, and may be estimated at 2000.

Carpenters.	500	Earn 8 to 10 As. a day.
Masons.	215	Earn 10 As. a day.
Blacksmiths.	A few families. Contract work, earns 12 As. a day.	
Goldsmiths.	Do.	Do. earns 10 As. a day.

Mat-weavers.	Some hun-	Earns Rs. 3 per mensem,
	dreds.	Cottage Industry.
Potters.	200	Earn Rs. 8 per mensem on an average.
<i>Cost of living.—</i>		
Cultivator's family.		Rs. 25 on average.
Cooly's family.		Rs. 7 ...
Single person.		Rs. 6 ...
<i>Number in family.--</i>		
Cultivator's family.		6 persons.
Cooly's family.		3 to 4 persons.

No. of people qualified as voters—184.

No. of professional people as Vakils, Teachers, Officials, etc.,
About 150.

Co-operation.

No Co-operative society was started in this taluk up to the end of 1092.

Joint Stock Companies.

No joint-stock companies were registered in the taluk up to the end of 1092.

Capital and Remarks.

There is not much ready capital in the taluk. The chief merchants come from Cochin and Alwaye to take the produce. The taluk is one in which large industrial enterprise would scarcely be possible amongst local people. Sugar, tapioca, rice hulling are the larger industries requiring capital and mat-weaving is the main cottage industry. Co-operation has very little hold here, and the workers have little money to invest in anything.

ETTUMANUR TALUK.

Area.—105·89 sq. miles.	Population—91,170.
No. of houses 20,423.	No. of Voters—77.
No. of Pakuthies.—10.	Taluk town. Ettumanur.

Location.

Division.—This taluk is situated in the centre of Kottayam Division.

Boundaries.—NORTH.—Muvattupuzha taluk.

SOUTH.—Kottayam Taluk.

EAST.—The Minachil Taluk and Minachil River.

WEST.—Vaikom Taluk.

Railway.—The nearest railway station is Ernakulam and has a distance of 40 miles, from Ettumanur of which 21 miles are by water. There is a direct Road to Alwaye the distance being 50 miles. Probably the best way is *via* Kottayam and Alleppey and thence to Cochin or Quilon.

Backwaters.—The shores of the south western portion of the taluk are washed by the Vembanad lake, south of Vechur. The Minachil river forms the eastern and south eastern boundary of the taluk and divided it from Kottayam Taluk. It is navigable for small boats for several miles beyond Ettumanur taluk. Big vallams can go only a few miles beyond Kottayam except in monsoon time.

Main Roads and Village Roads.—The main central road runs right up to the north from Kottayam and divides the taluk into two nearly equal parts. Good roads connect Ettumanur with Vaikom and Pala and Minachil. The village roads are in fairly good condition. A cartable road from Kozhai meets the Ettumanur—Vaikom road half way. The means of communication are generally satisfactory in this taluk, although much of the produce is head-loaded and improvement of village roads would greatly assist. A good example is found in the road to the sugar factory. To make the factory a success it should have a good cartable approach road but this is lacking and a rough way only is provided. The produce of the taluk is held up similarly in other places also. The Minachil Motor Service runs through Ettumanoor.

Nearest seaport.—Alleppey is the nearest seaport from Ettumanur. The produce of the taluk can be sent out

through Kottayam or direct by backwater from a basin in the canal about $3\frac{1}{2}$ miles from Ettumanur on the main central road. The distance from Ettumanur to Kottayam is six miles all by road. The distance from Ettumanur to Alleppey *via* Kottayam is only 26 miles. There is a regular boat service between Kottayam and Alleppey and all traffic to Alleppey goes through Kottayam. Both day and night boats run by steam and motor daily from Kottayam.

Cultivation.

Wet land area 11,272 acres. Dry land area 60,919 acres.
Cultivated area 6,792 acres. Cocoanut area 2,428 acres.

Pakuthies.

Name of Pakuthy.	Area.	Popu- lation.	Wet land.	Dry land.	Cocoa- nut area.
	Sq. miles.	Per- sons.	Acres.	Acres.	Acres.
Ettumanur.	18.54	15,080	1856	9356	222
Kanagary.	17.81	13,090	1840	9359	400
Manjur.	11.19	8,830	1884	5068	149
Omanturuttu.	4.95	3,700	1691	1287	70
Parambekuddu	2.39	2,830	328	1125	50
Kodumalur.	0.81	1,430	142	306	70
Kaipizha.	14.51	7,420	1942	7016	400
Kaduturuttu.	24.21	17,300	3595	11274	213
Kidangur.	11.48	13,190	986	6029	604
Thakkadu.	17.70	20,380	1005	10086	350

Education.

GOVERNMENT VERNACULAR SCHOOLS.

No. of H. G. Schools, 8. No. of boys 2221. No. of girls 293.
No. of L. G. Schools, 20. ... 2071. ... 802.

AIDED SCHOOLS.

No. of H. G. Schools, 2 No. of boys 543 No. of girls 39.
No. of L. G. Schools, 25 ,, 1513 No. of girls 543.

UNRECOGNISED SCHOOLS.

No. of schools. 26. Total No. of pupils.—1054.

GOVERNMENT GIRLS' VERNACULAR SCHOOLS.

Name of School.	Grade.	No. of Classes.	No. of Girls.
Ettumanur.	H. G.	7	246
Manjoor.	L. G.	3	81
Kattampaku.	Do.	3	73
Kuravilangad.	Do.	4	106
Kulathur.	Do.	3	78
Athirampuzha St. Mary's, aided.	Do.	4	133
Kumaranallur.	Do.	4	110
Kidangur.	Do.	4	97
Muttuchira.	Do.	3	81
Kaduthuruthi.	Do.	3	94
Kyppuzha St. Maret's aided.	H. G.	7	302

BOYS' ENGLISH SCHOOLS.

Government L. G. School, Ettumanur, 3 forms, 81 boys
11 girls.

St. Mary's L. G. School, Kidangur, 3 forms, 91 boys,

Do. Do. Kuravilangad, 3 forms, 99 boys

St. Ephrem's H. G. School, Mannanam, 6 forms,
299 boys.

INDUSTRIAL SCHOOLS.

Name of School.	Pupils.	Staff.	Subject.
Punnathara Sugar Industrial School, Ettumanur.	Pupils of the H. G. V. School.	One Teacher.	Sugar industry.

Natural Products and their Present Utilisation.

Paddy.—Paddy is cultivated to a large extent in the taluk. The total area under paddy is 11,272 acres and there

is only one crop of paddy in the year. In Kattuthuruthu pakuthy alone 3595 acres are paddy land. Paddy cultivation is found only over a small area of 142 acres in Kodumallur pakuthy. Paddy is grown not only for local consumption but also for export purposes. A large quantity is exported to Alleppey. A mill for rice hulling might be installed in the district with profit.

Cocoanut.—The total area under cocoanut cultivation is 2428 acres. Kanagari and Kaipuzha could be mentioned as the two cocoanut producing pakuthies of the taluk. The products of the tree are used not only for local consumption but export trade is also carried on to Alleppey and Cochin. Over four lakhs of cocoanut trees are found in the taluk. The great trouble here is the lack of soaking facilities in the interior pakuthies. If fibre extracting machines were installed much waste could be avoided and brush making could be done as a cottage industry. Copra manufacture is also carried on (see later)

Arecanut.—Arecanut trees are freely cultivated in the taluk. Four lakhs of trees are growing, the greater part of the produce obtained by slicing and drying the nuts etc., is exported to Alleppey. Experiments to find other uses for the nuts and for the extraction of the alkaloid should be conducted. The full economic value of these trees is unknown and considering their great number in the State it should be carefully investigated.

Tapioca.—This taluk is rich in land for the production of tapioca and other yams in common use by the people. In all the pakuthies tapioca is grown in abundance. Export trade is done in dried tapioca. The root is washed, sliced and sun-dried, and then packed in bags for export by vallam to Alleppey and other places. Flour making could be carried in a central place like Kottayam. More than 9000 acres of dry land are available for tapioca cultivation. This is a most suitable area and the industry should receive attention.

Arrowroot.—Arrowroot grows wild throughout the taluk and is utilised to a small extent at present. If a flour mill is established this root also can be profitably utilised. The value of arrowroot flour on the market is considerably good and ready markets are already awaiting supplies.

Sugar-cane.—The only sugar growing area in the taluk is in Ettumanur pakuthy on the banks of the Minachil river. The banks of the river are good sugar-cane growing area and

large plantations are found. At Punnathara, there is a sugar factory which is fed by cane brought from Kottayam and Minachil taluks. At present, the whole of this is crushed in mills worked by bulls, and then turned into jaggery by boiling. The method is crude and dirty. An attempt to refine sugar has been made at Punnathura. A capital of Rs. 30,000 was raised and a factory built. A brief description is set out below.

Situated 3 miles from the Ettumanur main road, on the road to Lalam and then one mile from Lalam road towards the river, *i. e.* due south.

Management.—The sugar industry in the place is conducted by Mr. Sankara Pillai, and others who are share-holders.

Investment.—The site is suitable and is on the banks of the river. Cost Rs. 12,000. The investment in plant comes to Rs. 15,000.

Plant.—Power is supplied by a 24 H. P. steam engine of modern design from Huddersfield (Messrs. John Broadbent & Sons.) and is communicated by a fly wheel and belt to a shaft running the length of a long shed, from which smaller wheels and belting supplied the power of the several machines.

Crushing.—Driven by a belt from the shaft, the cane is fed into the rollers by hand and the juice is collected in copper basins. Its impurities are strained off in metallic sieves. Lime and the leaves of "Lady-finger" are applied to get the sugar separated from the treacle. The sugar, in this watery state, is evaporated with the aid of a furnace arrangement, consisting of two tanks, one higher than the other, and communicating by means of a channel and taps. When the right consistency is obtained in the upper vat, the liquor is run into the lower one, strained in transit and then further concentrated by heating. This unrefined sugar known as molasses, is put into a centrifugal machine, giving 1500 revolutions per minute. The sugar is thus refined into a brownish looking material. No animal charcoal or any other chemical is used for refining the sugar. For further refining this is necessary. No Vacuum Pan is installed. This is also essential for further refinement.

Storage.—Ordinary earthenware chatteys, manufactured from the clayey soil of the immediate vicinity, in fact, the kilns, are at the factory gates.

Market.—No foreign or open market for sugar is found. For the purpose of encouraging the industry, Government took supplies for the use of certain temples. Molasses are sold in the local bazaars.

Existing state of the industry.—The factory is idle and no work is likely to proceed. A small quantity of sugar is stored.

Causes attributed for failure.—The factory was established five years ago, during which time no dividend has been paid to the shareholders. The last two years of working entailed loss due to—(1) Fermentation of glucose, (2) No market for glucose. Inefficiency was attributed by the proprietor to (1) insufficient cultivation of sugar cane, (2) the low percentage of sucrose in the juice so obtained, roughly 30 to 40% sucrose, 60 to 70% glucose, (3) the system of advances on standing and growing crops by the middlemen wanting the molasses for export. The cultivator is poor and accepts loans. The middleman takes the crop in return. The proprietor expressed the belief that if the mill had enough funds to grant similar loans the success would be ensured. The mill needs another Rs. 30,000 to run it successfully and no further capital is available locally.

General Impression.—The factory is well equipped and the location is quite good. Government has granted land at Thodupuzha to this company for experimental cane growing. The waste product of the crushing of the cane is unused except for fuel for the vats and engine. It seems by the fibrous structure as though it might possibly be utilised for paper manufacture. This is a matter for experiment. The chief reasons for the non-success of the factory are:—(1) the lack of working capital, (2) the lack of vacuum pans, (3) the want of a trained sugarist to control the process.

A sugar expert visited the mill and the whole area and his report was most encouraging. He stated that the canes grown at Ettumanur and Tiruvella were of excellent quality and up to the standard of anything he had ever seen. He was very sanguine as to the future of a well organised industry. The mill, he stated, needed a Vacuum pan and above all working capital and expert direction. The services of an expert sugarist were essential. The quality and quantity of the canes are alright, but the high price of jaggery in the vicinity is another cause mitigating against success. The additional cost of refining the sugar is not justified when nearly as good

a price is obtained for jaggery. The whole question needs careful organisation and plenty of capital. This will make it a success. The Director of Agriculture has demonstrated the advantages of growing sugar cane on specially manured areas with splendid results. Quality and quantity were increased and this being so, there is every reason to believe in the ultimate success of the industry if capital is found. Transport is easy and cheap for export and the cane growing districts are well situated. So much might be done with this sugar, it seems a pity not to go ahead. A Government controlled scheme would work best at first as this would ensure scientific handling of the goods. It might also be possible to extract Motor Spirit from the fermented glucose by distillation. This would be a by product and could be done by the Excise Department. Confectionery and preserves might also be made. The whole question needs serious thought and attention and is one of the points I wish specially to commend to Government.

Tests applied to Ettumanur sugar cane showed that two qualities of sugar could be obtained with only small wastage. Proper business method is needed for the success of the industry. The present capital needs doubling. The original company was floated for Rs. 60,000 and only half this amount was raised. If the whole capital, as estimated, had been collected the mill would have worked successfully with expert management.

Ginger.—Large plantations of ginger are found in the taluk and most of it is exported in the dried form to Alleppey and Cochin. The preserving of ginger for export purposes is an industry that is highly suitable for this district. The Japanese and Chinese articles are imported into India in glazed earthenware jars of crude shape and design. There is plenty of sugar in the district for the preservation purposes and also clay for pottery, and potters also exist in plenty throughout the taluk. If these people were taught the art of making the glazed jars and a preserving factory was established much of the trade with Europe, from China could be attracted here. This preserving industry could well be an adjunct of a successful sugar mill.

Fruits.—Pine-apple, plantains, jacks and mangoes are all grown in abundance in the taluk and fruit preserving could be established. All the materials, sugar and fruits are obtained locally.

Cashewnuts.—Cashewnuts are found in abundance in the taluk. The full use of these nuts has not yet been investigated. The economic and commercial value of the oil to be expressed from them is not fully known nor is the best method of extraction. The value for export purposes is also unknown. The bark yields a good tanning material containing 9.43 % tannin. The proportion of tannin to non-tannin is almost equal. The economic value of these trees is almost unknown and investigation is necessary.

Trees and Timber.—Jack, mango, anjili, and other common trees are found in abundance.

Minerals.

Good clay is found for pottery and is used largely for making tiles and pots. A tile factory is established in Parambukkada. It is in good working order. Potters are found in other places throughout the taluk.

Mica.—A good deposit of mica has recently been found near the Mudyoorakara Lower Grade Vernacular School. Both biotite and marcasite varieties are found.

Existing Industries.

Agriculture.—Of the products of agriculture paddy is the most important. Sugar cane, cocoanut, tapioca, ginger are also largely cultivated and engage some thousands of people. Besides, there are about 20000 skilled agricultural workers. The average yearly income of a landowner may be estimated at Rs. 500. His expenses would amount to Rs. 30 a month and hence little is left for him to improve his land. The average income of a skilled workman is Rs. 8 a month and this is barely sufficient for his expenses. The difficulty here is to find workmen for the supply of implements of agriculture. The trouble is the same as in other places.

Copra making and oil Pressing.—Copra making and oil pressing are carried on in the taluk but not to a very large extent. Copra is exported to Alleppey, and the local presses just meet local demands.

Coir Industry.—The lack of soaking facilities is the great impediment to the success of this industry. Coir making is carried on by a few people in Manjur pakuthy. It is also done in Kaipuzha pakuthy. The major portion of the husk is burnt for fuel. The introduction of fibre extractors

would extend the coir industry in the taluk and also enable a brush making industry to be established.

Weaving.—Isolated weavers are found in Kattuthuruthi and Manjur pakuthies but weaving is not an organised industry here. The people engaged simply make local cloths and the market for them is entirely a local one.

Tiles and Pottery.—There is a tile factory at Parambukada pakuthy. The tiles are used locally and also exported to Kottayam, Vaikom and Minachil taluks. Clay is obtained locally, particularly along the river side and firewood is plentiful locally. Many families of potters have settled down in the district and they supply the local needs. A great deal of the pottery is exported to Vaikom and other neighbouring taluks. The average earning of a potter is from Rs. 6 to Rs. 7 a month. He gets additional income from the compound ; generally, no rental is paid by him to his landlord. It has already been mentioned that there is plenty of scope for the manufacture of glazed earthenware jars and for the packing and storage of preserved fruits and ginger. There is also a wide market for these goods outside and it is certainly an industry that will achieve success when fully developed.

Umbrella makers.—A feature of the cottage workers is the presence amongst them of a number of professional umbrella-makers. There is a large local demand for their manufactures. The umbrellas are made with a bamboo stick and a covering of palm leaves. The palms are found growing in large numbers in the taluk. The cost of an umbrella ranges between 2 As. and 8 As. and superior ones even cost Re. 1. The average wages of a skilled worker amounts to 8 As. a day and the workers supply a purely local demand. The shape of the umbrella is the same as that of a mushroom. One is unable to shut them, and the new style steel frame variety imported from abroad is fast replacing them as being more portable and less cumbersome and inconvenient. It is these people who could be taught to make match boxes with the same material. This would be comparatively easy as they are already skilled in the use of tools to manipulate the raw material.

Basket making.—The Pulayas are skilled in making bamboo baskets. The raw products are brought from the forests by the workers themselves, and the finished baskets are sold in the market. There is a great local demand for

the articles and many persons either earn a living by this means or add to the family income. At present, this is not an organised industry and no attempt is made to improve it or to supply a wider market. The making of other useful articles such as bags, could also be taught to these skilled workers. The average income of a basket weaver is 6 Chs. a day, if he is in full work, but to many it is only an additional source of income.

Mat-weaving.—Screw-pine mats are woven by a few people. This is a small industry in the taluk compared with some of the other taluks further south.

Possible Industries.

Tapioca and Arrowroot flour making.—The possibility of this industry has already been discussed.

Cocoanut Industries.—These have already been discussed. The introduction of coir extractors would develop the coir industry in the taluk.

Brush-making.—The whisk from the coir extractors could be used for brush-making. This might be begun as a cottage industry.

Basket-making.—Baskets of different designs could be made if proper instruction is given to the basket weavers.

Sugar.—The establishment of a sugar refinery has already been discussed at length and, provided sufficient capital is forthcoming, would certainly succeed.

Fruits and Ginger Preserves and Confectionery.—This has already been mentioned. It would form an adjunct of the sugar factory at Ettumanur.

Match-boxes from palmyra leaves.—There are many palmyra trees in the taluk and match-boxes may be made from them as already pointed out.

Foodstuffs used and available locally.—Rice, chamai, tapioca, yams, plantains, peas, jacks, mangoes and vegetables. Fish is also consumed largely.

Economic Statistics.

Besides agricultural labourers and small landowners

there are some thousands of skilled artisans. They may be roughly divided as follows:—

Carpenters.	253.	Earn 8 to 12 As. a day.
Masons.	55.	Earn 10 As. a day.
Blacksmiths.	a few.	Earn 12 As. a day but generally contract work.
Goldsmiths.	a few.	Contract work & 12 As. to Re. 1 a day.
Potters	some hundreds	Rs. 6 to Rs. 8 a month.
Bas et makers	Do.	Earn 4 to 6 Chs. a day Rs. 3 a month.
Coolies.	Do.	Earn 5 to 6 As. a day.

Professional men.—About 200 including vakils, teachers, vaidyans, and others.

Cost of living.—Cultivator's family, Rs. 25 to Rs. 30 per month. Cooly's family, Rs. 6 to Rs. 7/8 per month. Single person middle class, Rs. 7 to Rs. 9 per month.

Number in family.—Cultivator's family, 6 or 7 persons. Cooly's family, 3 to 5 persons. No. of voters, 77.

Co-operation.

No co-operative societies exist in the taluq.

Joint Stock Companies.

Name of company.	Place.	Capital.
The Carpenter's Co-operative Corporation.	Ettumanur	Rs. 400
The Kerala Deepika Co., Ltd.	Ettumanur	Rs. 25,000
The Punnathara Agricultural and Industrial Co., Ltd.	Punnathara	Rs. 60,000

Capital and Remarks.

The total joint stock capital is Rs. 89,000, but no co-operative capital is found in the taluq. It must be borne in mind that the above joint stock capital is the registered amount and not the actual figure collected. Rs. 30,000 was only obtained for the Punnathara Company. It is doubtful

if much capital can be raised here now as the failure of the sugar mill has had a detrimental effect on the investing public. However, if capital is to be collected in the future, the sugar mill should just be worked successfully and the moral effect of the failure removed. The ryots are generally poor and take advances to enable them to cultivate their crops. A means of freeing capital locked up in land would be desired and would greatly stimulate industrial development.

TIRUVELLA TALUK.

Area. 172.18 sq. miles. Population. 1,75,030. No. of Houses
33,253.

No. of Pakuthies. 18. Taluk Town.—Tiruvalla.

Location.

Division.—Tiruvella is one of the northern-most taluks of the Quilon Division. It occupies the middle portion among the three northern taluks of the Division.

Boundaries.—NORTH.—Chenganachery Taluk.

SOUTH.—Chengannur Taluk. The Pampa river divides Tiruvella Taluk from Chengannur in the south.

EAST.—Chengannur Taluk.

WEST.—Kartigapally and Ambalapuzha Taluks.

Railway.—Tiruvella is not reached by any railway. The nearest railway station is at Kottarakarai and is 34 miles distant. The produce of the taluk does not go by rail as it is more easily taken to Alleppey by water.

Main Roads and Village roads.—The main central road passes through Tiruvella and divides the taluk into two unequal portions. From Tiruvella one road goes to Mavelikara and another to Kozhanchery. The village roads are not in good condition and in many cases scarcely cartable. There are instances here of local effort being expended to improve

the condition of the roads and particularly the road from Tiruvella to Eraviperur and onwards beyond. This was made almost entirely by local effort.

Backwaters and Rivers.—This taluk is not washed by backwaters. The Manimala River cuts the taluk into two equal portions. The Pampa river passes through the taluk in the south and forms a portion of its southern boundary. Both the rivers are navigable for all the year round for boats and are the chief means of communication between Alleppey and Tiruvella. Tiruvella can be reached from Mavelikara, Kayankulam and other places by water alone. The landing places for Tiruvella are usually Manipuzha or Pulakezh. The Changanachery backwater is also only 6 miles from Tiruvella and a regular motor boat service is run daily between there and Alleppey. This is only 16½ miles and is open all the year round. It is much used for traffic.

Nearest Seaport.—Alleppey is the nearest seaport and is 23 miles distant. It can be reached by water and regular services of vallam run between the two places.

Cultivation.

Wet land area, 21,184 acres. Dry land area, 57,600 acres.
No. of Cocoanut trees, 4,50,000. No. of Arecanut Trees, 5,80,000.

Pakuthies.

Name of Pakuthy.	Area.	Population. Acres.	Wet land. Acres.	Dry land. Acres.	Cocoanut land. Acres.
Kishakkebagam ...	4.31 Sq miles.	8276	2087	464	464
Kadappira ...	6.50 "	14630	2249	1426	1426
Nedumpuram ...	3.31 "	4610	1304	544	540
Perungur ...	4.87 "	8620	2267	694	693
Kavumbagam ...	4.23 "	9000	1611	821	821
Tiruvalla ...	9.62 "	11380	1723	4037	3900
Eraviperur ...	10.92 "	9130	1745	4646	3540
Kaviyur ...	11.72 "	8000	1141	6168	136
Eshamattur ...	19.91 "	7720	485	9524	3314
Koippuram ...	8.63 "	7230	914	4351	181
Aranmula ...	9.38 "	22190	1124	4222	200
Tottappushacheri ...	5.62 "	7830	405	2966	2066
Mallapushacheri ...	7.35 "	12750	881	3262	3267
Cherukol ...	14.68 "	8020	544	6040	6040
Ayirur ...	9.96 "	8580	275	6091	5568
Kallupara ...	34.48 "	25000	1286	17203	5000
Mannaru ...	3.08 "	5430	670	1171	1171
Kuratticheri ...		4380	1759	487	486

Education.**GOVERNMENT VERNACULAR SCHOOLS.**

No. of H. G. Schools. 20. No. of Boys. 5551. No. of Girls. 741.
 No. of L. G. „ 33. „ 3590. „ 1588.

AIDED SCHOOLS.

No. of H. G. Schools. 7. No. of Boys. 756. No. of Girls. 227.
 No. of L. G. „ 143. „ 6441. „ 3685.

PARTIALLY RECOGNISED SCHOOLS.

No. of Schools. 16. Total strength. 538.

GIRLS' SCHOOLS.

No. of H. G. Schools. 11. No. of Girls. 2474.
 No. of L. G. Schools. 15. No. of Girls. 1516.

ENGLISH SCHOOLS FOR BOYS.

Name of School.	No. of Forms.	No. of pupils.	
		Boys.	Girls.
St. Thomas L. G. School, Kadapara.	2	69	26
Do. Do. Eraviperur.	3	132	12
Do. Do. Kozhenchery.	3	288	28
C. M. S. School, Kuzhikkala.	3	88	14
Do. Mallappalli.	3	136	20
Nair Samajam, H. G. S. Mannar.	6	379	25
M. G. M. School Do. Tiruvella.	6	473	13
S. C. S. H. G. School. Tiruvalla.	6	476	2
St. Mary's L. G. School, Niranam.	Prep: Class	21	4
P. M. M. L. G. School, Aiyurur.	2	94	14
G. D. Do. Do. Aiyurur.	1	36	2
L. G. School, Maramon.	Prep: Class	41	7
Do. Do. Valankara.	1	43	10

ENGLISH SCHOOLS FOR GIRLS.

Government L. G. School. 3 Forms. 128 Girls.
 Nicholson Memorial H. G. E. S. 6 „ 134 „

INDUSTRIAL SCHOOLS.

One Industrial School is established for teaching carpentry and allied subjects this year. It is aided by the Government. At the present time, instruction is given on Saturdays and Sundays and also during the holidays. This institution is more of the nature of a continuation school.

Natural Products and their present Utilisation.

Paddy.—The total area under paddy cultivation is 21,184 acres. Paddy is grown not only for local consumption but also for export. There is a rice mill working at Pulikezh. It is situated on the bank of the river and the locality is good. The engine registers 20 h. p. of which only 17 h. p. is utilised for the husking. The hulling machine works only 8 hours a day and to keep the works going, paddy is imported from Cochin. The local paddy does not come to the factory in large quantity as most of the people husk it themselves. The company has invested Rs. 12,000 in the concern and it has been working for 6 years.

Cocoanut.—There are about $4\frac{1}{2}$ lakhs of cocoanut trees. Coconut cultivation is carried on in all pakuthies, but in many of them cocoanut is grown only for local consumption. Among the most important cocoanut growing pakuthies could be mentioned Vallamkulam, Kadappira, Kizhakkumbakam, Peringor, Kaviyoor and Kallupara. Cocoanut is exported to Cochin and Alleppey as copra. Cocoanut oil is also extracted locally.

Tapioca.—Tapioca is cultivated all throughout the taluk and more than half the population live on this as their staple foodstuff. There is more land available for this cultivation. Much has already been done, but acres of land are lying fallow in alternate years for want of manuring and large areas are still uncultivated. A large amount of tapioca is exported to Cochin and Alleppey in the dried state. Tiruvella is a very good site for tapioca flour factory for Central Travancore. Water is good and plentiful and it is the centre of many of the tapioca growing areas. It is also more favourably situated in point of communication than many other towns. There is a wide scope for development of tapioca products in this district.

Sugar-cane.—Sugar-cane cultivation is carried all along the river-side. The following pakuthies are important sugar-growing areas :—Ayirur, Mallapuzhachery, Kalloppaara,

Karrioor, Eraviperoor, Kavumbhagom, Kizhakumbagom, Kuthur and Thalayar. Sugarcane is grown in quantity and is now used for making jaggery or molasses, which is largely in demand by the local people. Export trade is carried on to the neighbouring taluks and also to Cochin.

A typical example of the sugar-growing area is seen at Eraviperur and is fully described below :

Eraviperur is reported to be the best sugarcane producing area in the taluk and in the State. My visit confirmed this, for there was a large quantity of cane growing everywhere.

Only indigenous varieties are cultivated by the ryots. They have not yet attempted any manuring at all. The soil is most suited to the cane, and yields a flourishing growth.

The use to which the cane is put is the making of molasses. This is done by a simple method. The juice is crushed out by means of a crushing machine, which is made abroad. It consists of three cylindrical metallic rollers, which are rotated by means of a cog-wheel. This wheel is turned round by means of a shaft drawn by bullocks, driven round a circular track. The juice is collected in a huge brass cauldron, and is boiled in a similar vessel. The dirt and foreign matter are removed by means of coir netting ladles, and at the right consistency the liquor transferred to another cauldron where it is concentrated. Finally it is collected in wooden basins and allowed to solidify. This gives molasses. Everything is done by hand, except the crushing. The process is unclean and much of this handling with the hand could be avoided, if after crushing, the juice is boiled in one vat placed at a higher level than the others. The two basins might be connected by means of a tap and a conduit pipe. When the contents of the higher vat have been boiled to the correct consistency the juice could be released through the tap, and passed through a metal sieve of narrow mesh, sufficient to remove the larger dirt and impurity particles. Thus it passes into the other vat clean and is again boiled to the right consistency, and allowed to solidify. This would produce cleaner molasses than the one now made locally. In fact the product would not be very coloured.

These molasses contain 50 to 60 per cent sucrose which is much higher than that of Ettumanur.

Arecanut.—There are about 6 lakhs of arecanut trees growing in the taluk. The nut is boiled, cut and dried. It is then exported to Cochin and Alleppey. Experiments of this product should be conducted so that better use could be made of it. As indicated in other reports research work is necessary.

Plantains.—Bananas and plantains are extensively cultivated in the taluk. A large portion of the fruit is exported raw to Alleppey, Ernakulam and other places. There is scope for increasing the cultivation, if a wider market is shown to the people. Banana flour and fruit preserving could be introduced and would give a stimulus for increased cultivation and output.

Lemon-Grass.—Large plantations of this grass are found in the taluk. Most of the grass is utilised for distillation of the essential oil. It is carried on in the old method. Large quantities of the oil are exported to Alleppey and Cochin. The citrol content of the oil is poorer than that of the oil from Alwaye and the average is between 65 and 70 per cent. Throughout Travancore Lemon-Grass grows in abundance and in Central Travancore it is available in very large quantities. Mavelikara, Tiruvella, Punalur and many other places round about these centres, yield excellent crops of this grass every year. At Chunnakara in Mavelikara Taluk a large number of disused stills are now in existence whilst in other places they have been sold and discarded. Before the war, a considerable export trade was done in this commodity and shipments were made to Europe for the manufacture of artificial scents and for use in soap manufacture. Ionone or artificial violet is one of the best known of these. The industry in Travancore has been steadily declining for some years, even before the war cut off the European market entirely. Several causes are attributed but after careful investigation the real reason is obvious.

At Arnalloor one plantation extends over 14 acres. The total amount of oil obtained from this plantation is 100 bottles of 24 oz. each. The present price of the oil is Rs. 2/8 per bottle.

Cashew-nut.—Large numbers of cashew-nut trees are found in the taluk but very little use is made of the products. The wood is used for fuel and nuts are gathered by local

people and consumed locally. Experiments could be conducted on the various products of the tree. The value of the bark as a tan-stuff has already been indicated and fully discussed.

Fruits.—Mango, jack, pine-apple, grow well in this taluk.

Trees.—Oil bearing trees—Marottie, Pinnay, pine are all found in large numbers in the taluk.

Timber trees.—Anjili, seelanthi, black-wood, venga, thempavu, etc.,

Umbrella & Sago Palm.—Umbrella and sago palms are also grown well in the taluk. The “kitul” fibre of commerce, used for cordage, brushes, brooms, etc., could be extracted from the latter. The leaves of the former can be used for match box making and the leaf sheath and stalk for fibres.

Minerals.

Mica.—Mica is found near Pullanad, in Vallamkulam Hills and Kanakapuzha Hills.

Clay.—Clay for pottery and tiles is obtained near Puli-kezh and also in other parts of the taluk.

Kaolin.—China clay occurs in Tiruvella at a depth of 30 to 50 ft. below the surface as a thick vein.

Existing Industries.

Agriculture.—Paddy cultivation extends over 21,184 acres and there is only a single crop in the year. It is about one fifth of the total area of the taluk. Besides paddy the important products cultivated are—sugar-cane, cocoanut, lemon-grass, tapioca and plantains. About 40,000 persons are connected with agriculture in some way or other. The average earning of a cultivator is Rs. 300 to Rs. 400 a year. An agricultural labourer receives 4 as. a day as wages. The local rice-mill has already been mentioned. It is driven by steam power, but the local work is insufficient to keep it fully working. The lack of skilled workers in subsidiary trades is felt and a school for agricultural implement making blacksmithery and carpentry would succeed greatly in minimising the difficulties now felt by the local ryots as regards the tools for the pursuance of their calling.

Cocoanut Industries.—Copra-making is carried on by many people in various parts of the taluk. Some of it is

used locally by the oil-mongers but a major portion of it is exported to Alleppey. Remarks in other reports re-copra manufacture apply here.

Coir Industry.—Coir industry engages only very few in the taluk. Most of the husks are exported to Kayankulam and neighbourhood, for soaking purposes. The want of soaking facilities is keenly felt everywhere. The introduction of fibre extractors would be of much benefit in the taluk and bring a tremendous profit to the people by utilising raw material now wasted.

Jaggery making.—This has already been fully discussed under sugar-cane. It is a flourishing industry and needs development.

Lemon Grass Distillation.—This industry has also been discussed in full under natural products.

Tapioca.—Tapioca is sliced and dried in the sun and is exported in quantity to Alleppey and Cochin. This industry could be developed, more tapioca could be grown, and tapioca flour manufacture could be begun in the taluk. The possibility of starting the industry has been discussed in our Bulletin No. 8 and earlier in this report. Tiruvella is a good place for a large factory.

Tanning.—A tannery has been established by Mr. John Mathew near Tiruvella and has been working for the last 8 years at a profit. Chrome tanning only is carried on in the tannery. The monthly output of this tannery is 100 tanned hides. About 2 cwts. of tanning materials are consumed per mensem in the factory. The possibilities of a tannery in Central Travancore have been mentioned already in the report. Many hundreds of hides and skins are exported from Changanacherry every year and they could be properly tanned in a central place like Tiruvella, where the tanning materials could be easily brought from the forests. The utilisation of cashewnut bark also may be a possible factor as it grows so prolifically in the vicinity. The tannery has also a boot and shoe factory attached to it and a large business is done in this direction also. Given proper encouragement and expert advice, the industry could be built up here most easily as the raw hides are in plenty.

Soap.—Soap-making is carried on as a small concern by a Namburi Brahmin in Tiruvella. His method of manufacture is not scientific but based entirely on old books. The

alkali used by him is obtained from ashes of cudjan. He sells his soap locally. He makes his own soda from the cudjan ashes, but much free lime is found in his soap. The efforts of this man are praiseworthy but they are crude and he is working in the dark. He is untrained and does not understand scientific method and production. He is producing inferior quality goods from good raw material. It is essential that the point already mentioned be observed rigidly *viz.*, soap-making is a chemical and scientific process and training in proper methods is absolutely essential for success as an industry.

Weaving.—Isolated weavers are found scattered about the taluk. They weave inferior cloth for bath towels, etc., and sell it locally. A small community of 5 or 6 families is found living and working between Tiruvella and Manipuzha.

Bronze Workers.—At Mannar near the road there are about 20 families of bronze workers, numbering about 50 workers in all. They work for local needs and the raw materials used by them are generally old and broken brass and copper vessels. Their work is mainly on contract and as a rule the buyers supply them with the necessary raw material. The usual method of making moulds from crushed broken earthenware pots and wax, is followed. The average earning of a workman varies from Rs. 10 to Rs. 15 per mensem when he is in full work. In the majority of cases these men do not get sufficient work for the full month and hence they are left with scanty means of support. Locally required culinary utensils are largely supplied and sold in Tiruvella and Mavelikara. The workers are quite unorganised and work independently on old methods and patterns.

Metallic mirrors.—Aranmulay is famous for its metallic mirrors. The manufacture of these mirrors is in the hands of two or three families, to whom the secret of the manufacture has been handed down by posterity. At one time there was some local demand for the article. But now they are bought only out of curiosity and the industry is declining. The price of the articles is prohibitive. For example, a mirror 12" by 8" costs Rs. 40 to Rs. 50. Smaller sized mirror can be had for Rs. 12 and upwards. The demand for the articles is very limited and now they work only to order. The mirror is made of an alloy of copper, the composition of which is kept a secret by the family, and is finely polished.

Basket making.—This is a small cottage industry among the Pulayas. The bamboo required, is obtained from the forests. These workers supply the local demands and earn Rs. 3 per month. This is carried on only during leisure hours or when they do not work in the fields.

Mat weaving.—Screw-pine mats are made by local workmen and are sold in the local bazaars. This is a cottage industry in the taluk and is usually carried on by the women in their homes.

Rattan making.—A few rattan workers are found in the taluk. The rattan is cut from the forest and conveyed home by the workers themselves. These people work only to supply the local needs and are unaware of the wider markets and their demands. A depot would greatly help these people.

Sericulture.—There is a Government demonstration farm at Tiruvella for mulberry cultivation and sericulture. Silk reeling is also done. A small mulberry garden is also cultivated in the town by the pupils of the C. M. S. High School. The results are encouraging in their initial stage and there is ample scope for development of the cultivation and the reeling in the compounds and homes of the poor people.

Pottery.—A few potters and brick makers are found in the taluk but most of the local demand is met from Changanachery. Good clay is found in the taluk and a tile factory could be established in Pulikezh. Local capital would be forthcoming for this purpose and is already available. The engine from the rice mill could be utilised for driving the machinery since its power is not fully used. A puddling machine and a mixer are required. The clay is of excellent quality and the finished goods would supply an urgent local need.

Possible Industries.

Cocoanut Industries, Tapioca flour factory. Sugar factory. Tile factory, Rice Mill, and Tanning.	}	These have already been fully discussed in this report.

Plantain fibre.—The plantain fibre industry could be started in the taluk. The local weavers could be instructed

to weave it into cloth after it has been fully treated and softened. Handkerchiefs and other useful articles could be woven successfully and profitably and the fibre also prepared for export.

Silk.—Silk reeling could be introduced in Tiruvella as a cottage industry and would be successful.

Fibre Industries, Brush-making.—As has already been mentioned, fibre from the palm trees could be extracted and brush-making introduced.

Match-box making.—This could be introduced as a cottage industry and the local mat-weavers could be instructed in the methods of manufacture. The leaves of the umbrella palm are found in quantity so that this industry would be a profitable one.

Foodstuffs used and available locally.—Rice, tapioca, yams, cocoanut, plantains and bananas and vegetables. Fish is also an important article of food.

Economic Statistics.

In addition to the agriculturalists, there are some thousand men engaged in various other crafts. They can be roughly classified as follows :—

<i>Name of craft.</i>	<i>No. of persons.</i>	<i>Daily earning.</i>
Carpenters	400	10 to 12 as. a day.
Masons	300	8 to 10 as. a day.
Blacksmiths	30	Contract work. 12 as.
Bronze workers	70	Rs. 10 to Rs. 15 per month.
Copra makers	few	up to Rs.20 a month.
Weavers	About 20 families	Rs. 8 a month.
Basket makers	Some hundreds	Rs. 3/ per month for leisure time.
Coolies	Some thousand	8 Chs. a day.
<i>Cost of living.</i> —Cultivator's family		
	Cooly's	Rs. 30 a month.
	„	Rs. 5/ „
	Single person	Rs. 9/ „
<i>No. in family.</i> —Cultivator		
	6 persons on the average.	
	Cooly	4 persons on the average.

Co-operation.

	<i>Members.</i>	<i>Capital.</i>
The Kalloor Co-operative Credit Society, Tiruvella	48	Rs. 3567/12.
The Kavangamprayar Co-operative Credit Society	31	Rs. 1826/8.
The Ayiroor Co-operative Society	111	Rs. 2923.
The Tiruvella Co-operative Distributive Society	39	Rs. 369.

Joint-Stock Companies.

The Kandathil Kudumba Yoga Co., Ltd., Tiruvella.	Rs. 100,000	
The Travancore Bank, Ltd.,	Rs. 100,000	
The Kandathil Kudumba Yoga Bank ...	Rs. 200,000	
The Malabar Mar Thoma Syrian Xian Evangelistic Association, Tiruvella.	Rs.	Voluntary contribution.
The Kandathil Kachava Co., Ltd., Thiruvella	Rs. 50,000.	
The Travancore National Bank, Ltd. ...	Rs. 200,000.	
The Malabar Co-operative Rubber Co., Ltd., Kozhenchery.	Rs. 150,000.	
Pallippadavil Kudumba Yoga Co., Ltd., Vadapara.	Rs. 100,000.	

Capital and Remarks.

The total co-operative capital is Rs. 5118/8. The total Joint-stock capital is nine lakhs of rupees. Already there is a large joint-stock capital in the taluk and much more money is available if only the lead was taken and demonstration given. A co-operative depot would help cottage industries and the co-operative movement is already begun here though only in a small way. This taluk has unique opportunities for industrial development. What is lacking is mutual trust and co-operation between different parties. Differences of thought in other directions often mitigate against whole hearted support of a project. Tapioca flour and sugar cane are the two most promising new industries whilst the other points mentioned in the report are also very important. The new bridge over the main central road has done much to facilitate

transport and the completion of the other bridges in the near future will make Motor Traction of a [heavier type possible right up to the railway. At present there is a motor bus service daily to Chengannur, which is only 6 miles from Tiruvella.

ERANIEL TALUK.

Area.— 99.82 sq. miles. Population.— 1,10,160.
 No. of houses.—22,030.
 No. of Voters.—125 No. of Pakuthies.— 13
 Taluk Town.—Eraniel.

Location.

Division.—This taluk forms the southern portion of Padmanabhapuram Division.

Boundaries.—NORTH—Kalkulam taluk.

SOUTH—Arabian sea.

EAST—Agastiswaram taluk.

WEST—Arabian Sea and Vilavancode taluk.

Railway.—No railway touches this taluk. The nearest railway station is Trivandrum and is $34\frac{3}{4}$ miles distant from Eraniel. There is a direct road to Trivandrum which is in good condition for traffic. Most of the produce however goes out *via* Nagercoil, Tinnevely and Tuticorin, because of the great saving in railway freight thus effected.

Backwaters and Rivers.—The taluk is bounded by the sea on the south-west and the length of coastal boundary being 18 miles. There are no backwaters or lakes. The Valli River rises in Kalkulam taluk and flows south through the town of Eraniel and enters the sea near Kadiapattanam. The Ananthan river has its source in the forests of Kalkulam, passes through Tovala taluk, a little to the west of Bhuthapandy, cuts across Agastiswaram and enters Eraniel taking a southerly direction and falls into the sea. Neither of the rivers is navigable.

Main Roads and Village Roads.—The main central road passes through the north-eastern extremity of this taluk. A branch of this road goes to Eraniel from near Thuckalay, extending up to Colachel. Another road runs from Eraniel southeastward to Nindakara and Muttom. The road running from Eraniel to Thengapattanam is almost parallel to the main central road for a long distance until it leaves this taluk.

There are many other village roads, besides, and they are all in good condition. This taluk is well served in the matter of roads and the means of communication are all good. Transport is almost entirely done by bullock carts and the head loading is but small.

Seaport.—The only seaport of any importance in the taluk is Colachel and shipping is carried on from there. Many of the important articles of export are shipped from Colachel to Bombay, Tuticorin, etc., by native craft and to other further distance by steamer. The distance from Eraniel to Colachel is only 4 miles. Palmyra fibre and Monazite are the main exports.

Cultivation.

Wet land area, 8079 acres. Dry land area, 36,086 acres. Coconut area, 4064 acres.

Pakuthies.

Name of pakuthy	Area.	Wet land.	Dry land	Coconut land.
	sq. miles.	acres.	acres.	acres.
Eraniel	4.72	477	1985	200
Thazhakulam	8.24	1002	3502	250
Kadiyapattanam	7.43	487	3759	133
Manavalakurichi	4.72	440	2031	766
Colachel	11.89	699	5623	1450
Kilikulam	4.03	155	2048	470
Killiyoor	8.09	610	4272	49
Kilmidalam	3.65	229	1718	100
Midalam	6.17	406	2878	77
Pattalam	6.24	557	2811	40
Allur	9.21	1930	874	56
Nindakara	19.90	612	2542	875
Tiruvankodu	4.10	475	2044	99

Education.

GOVERNMENT VERNACULAR SCHOOLS.

No. of H. G. Schools. 4. No. of boys. 1352. No. of girls. 25.
No. of L. G. Schools. 12. ... 1787 ... 228.

AIDED.

No. of H. G. Schools. 3 ... 404 ... 73
No. of L. G. Schools. 69 ... 3624 ... 1430

UNAIDED.

No. of Schools. 18. Total number of pupils. 861.

GOVERNMENT VERNACULAR SCHOOLS FOR GIRLS.

No. of H. G. Schools.	1.	No. of girls.	170
No. of L. G. Schools.	8.	...	626

AIDED.

No. of H. G. Schools.	1	...	349
No. of L. G. Schools.	9	...	659

ENGLISH SCHOOLS.

Government L. G. English School, Eraniel	3 Forms
236 boys	14 girls.
L. G. English School, Colachel.	1 ...
27	4 ...

There are no English schools for girls in the taluk.

INDUSTRIAL SCHOOLS.

Neyoor Weaving Institute (Private) 26 pupils. 2 teachers. Weaving of fly shuttle looms
Theoretical & Practical study of the different parts of the looms. Government aid Rs.40/per mensem.

Natural products & their present utilisation.

Paddy.—There are 8074 acres of paddy land in this taluk, all of which are double cropped. The Kothayar Irrigation Project has converted a large portion of the dry land into paddy land. The paddy grown is not sufficient for local consumption and so much of it is imported from Tinnevely, and directly by sea from Bombay, Rangoon and Cochin.

Cocoanut.—This taluk produces only a comparatively small amount of cocoanuts. The total area under cocoanut is estimated at 4064 acres, and the number of trees is about $2\frac{1}{2}$ lakhs. The total production of cocoanut is however small, compared with the northern taluks. Of all the paku-thies, Manavalakurichi and Kilkulam contain the largest number of cocoanut trees, these being situated along the coast. The cocoanut produced in the taluk is locally used up. Copra making is carried on to some extent and the copra is used in the local oil-mills. There is some small export. An attempt to establish a power-driven oil-mill at Monday Market failed owing to lack of raw material and working capital. There is not sufficient oil for export purposes. The husks are not utilised to a great extent in

the taluk for fibre extraction, although coir-making is carried on a small scale by some people in Manavalakurichi.

Tapioca.—Tapioca is grown largely in all parts of the taluk and forms one of the cheapest foodstuffs of the poorer classes. The products are collected in a central place on Market days and are distributed to the various parts of the taluk. The Monday Market is one of the biggest markets in the taluk and is held in the town of Neyoor. There is also a Friday Market which is of considerable importance.

Palmyra.—There are over 7 lakhs of palmyra trees in the taluk, some of which are tapped for toddy and jaggery-making. Others are made use of for their fibre and leaves. The leaves are made into baskets and mats and the fibre from the leafstalk is sold to the firm in Colachel for export.

Other Products.—Pine-apples, Plantains, Mangoes, and Jacks are the important fruit trees available in large number and their products are now used for local consumption.

Among others may be mentioned, yams, peas, grams and gingelly. These are produced only in small quantity.

Trees & Timber.—*Oil-bearing trees*.—There are about 2 lakhs of Pinnay trees found in the taluk. The seeds are collected every year and pressed in the local mills for oil which is exported to other parts of Travancore. This taluk may be taken as the largest pinnay oil producing area.

Illuppa and Veppu are others.

Timber trees.—Portia, jack, mango, the Acacias, etc.

Minerals.

Eraniel is a taluk rich in minerals of various kinds. Among them may be mentioned mica, graphite, chalcedony, pyrites, etc.

Mica.—Mica is found—(1) Near Karungal. It is of the muscovite variety and has lost its lustre and elasticity.

(2) Tippiaramali. The deposit is of the phlogopite variety and is largely developed.

(3) Surukky. It is a small deposit of the phlogopite mica.

(4) Appiyode.

This mica is now being worked in many places by Messrs. Christian & Co., who have been licensed by Government for this purpose.

Graphite.—Graphite is found—(1) Near Karingal at 90 ft. This was formerly worked by Messrs. Parry & Co.

(2) Attapalam. The deposit is 250 ft. in breadth, like a pocket or lens and is good in quality. The quantity and the extent of this deposit is not yet estimated.

Chalcedony.—Chalcedony occurs (1) at Attapalam in large blocks weighing 160 lbs. but is not homogeneous and not perfectly translucent; (2) at Appyode in a regular vein 5 inches in thickness.

Clay Iron-Stone.—Large quantity of this mineral is found near Kilkulam.

Pyrrhotite.—Pyrrhotite occurs in fairly large quantity near Kilkulam. The quality is good and it is free from impurities. Fine quartz occurs in quantity in Colachel.

Clay.—Clay occurs in large quantity near Eraniel and also in other parts of the taluk. The clay is of the good quality suitable for bricks and tiles and many tile works exist.

Monazite.—The large deposits of monazite sand found here are of considerable value and importance as being almost unique. The Travancore Minerals Co., Ltd., have the right of removal from the sea-shore whilst Messrs. Hopkins and Williams Ltd., are working on the ground immediately behind. The former company scoops up the sand and separate on pneumatic vibrating tables mechanically. The latter company use magnetic separators and have to mine the raw material. The State derives considerable revenue from these deposits in Royalties. The origin is not yet known. Around the district are many other rare earths, but these are not fully known. A detailed commercial geological survey of this taluk alone would be of enormous value to all concerned. The total quantity of monazite obtained annually from Travancore is over 1200 tons from one company alone.

Existing and Possible Industries.

Agriculture.—Paddy cultivation, growing tapioca and other yams, growing peas and other cereals are the main features under agriculture. There are over 8,000 acres of paddy land which are double cropped annually. This industry occupies more than 15,000 persons. The number of land-lords may be estimated at about 100 and their average annual income is Rs. 2,000. The expenses come to more than Rs. 1,500 a year in such families and little is left for improving their lands. The agricultural labourer earns 8 chs. a day and he spends the whole of it for his daily

needs. In the majority of cases, the labourer lives in poverty and want, when the labourer has no work in the paddy fields, he does work in his compound, in growing yams, tapioca and other materials. Cooly labour here is more independent. The Monazite and Mica Mines, the Palmyra Fibre Factories and Weaving all take large numbers of workers so that agricultural labourers are more difficult to get. Large areas of palmyra are found in the taluk. Regular pay and work at the factories is a great attraction to the labourer.

Palmyra Industries, Palmyra Fibre.—The Palmyra Fibre Industry is one of the most important in the taluk as Colachel is the main centre for South Travancore. The industry is carried on by two firms, namely, Messrs. Vavasseur & Co., Ltd. and the Madura Co., Ltd. Both firms have large and well equipped establishments for dealing with the fibre. Fibre is obtained from the leaf stalk and also from the fronds. Four kinds of fibre are torn from the former and from the latter the extraction is done by beating with wooden hammers. The strongest stalk fibre is torn from the edges and the weakest from the centre. The fibre torn from the lower side is intermediate in strength. From these fibres are made cables, cordage, ropes, yarn, brushes, rough hats and baskets. The refuse of the stalk forms fuel and manure. From the fronds, the fibre is obtained by beating it with a wooden hammer and extracting the fibre thus detached. The best trees for the purpose are those attaining 12 to 15 ft. in height and from 10 to 19 years of age, as in these there are more leaf-stalks attached to the trunk. There is great demand for the fibre in Europe and also in Japan to which place it is now shipped in large quantities. The following are the figures relating to the export of raw and manufactured fibre during the last six years from Travancore :—

Year.	Raw.		Manufactured.	
	Cwts.	Value Rs.	Cwts.	Value Rs.
1087	8	105	17,970	2,54,691
1088	6	83	18,107	2,59,666
1089	11	145	20,323	3,11,778
1090	2,444	1,700	10,025	1,61,617
1091	2,737	1,711	14,438	2,22,933
1092	1,636	1,023	15,425	2,25,685

The Palmyra Fibre Industry is carried on at Colachel by various firms. In common with other industries the war has considerably affected the annual out-put of the fibre. On account of the fact that the fibre is extracted from the fronds of tender trees and as only a small covering of leaves is left at the top, it is remarked that the removal of the fronds prevents the healthy growth of the trees. It may be mentioned, however, that observation shows that the tender trees have on an average from 25 to 40 fresh green leaves at a time, of which 12 to 15 may be cut off annually without injuring the tree seriously although of course, the tree is slightly affected.

For commercial purposes, the fibre has to be treated chemically and dyed. A form of fibre which is bleached is very valuable. The bleaching process has been worked out by this department and is as follows :—

Bleaching of fibre.—Soak the fibre in warm water for one day, to loosen the fibre, then (2) boil for 6 hours in a solution of caustic soda, containing an ounce of soda to every gallon of water. Then wash for half an hour in cold water, (3) treat this from 14 to 18 hours with a solution of freshly powdered bleaching powder. Two to three ounces of bleaching powder should be added to every gallon of water. Again wash this for half an hour, (4) Soak for an hour in a solution of Hydrochloric Acid, containing two ounces by volume of acid per gallon of water. Wash with water for an hour. (5) Steep for an hour in a solution of soap in a gallon of water. Again wash and dry in the sun.

The question of obtaining a suitable black dye for the fibre was also taken up by us. The absence of German Synthetic dyes was keenly felt and experiments were conducted successfully to obtain a suitable substitute. It was discovered that Cutch and soda gave the requisite black but it was of slate colour and not of the bluish-brown necessary. It was found as the result of experiment that a light topping of indigo gave the requisite tone and this has now been adopted. The Indigo grows at Vadasserry and Colachel easily and reports from the various markets confirm the samples as being quite good. The price is also considerably less. Cutch is the dried extract of a species of acacia and was formerly very much used in Europe for the production of fast brown shades. It has been found that the demand for fibre in foreign countries was mainly for the manufacture

of brushes, and the question of starting brush manufacture was investigated. The matter was discussed with many local gentlemen and they were convinced of its excellent chance of success. Excellent specimens of locally made brushes ready for export have been made for Messrs. Vavasour and Co., Ltd., Colachel, by local workmen, under their guidance and instruction. House brooms, coat brushes, yard brooms, etc., have been sent as samples and are approved of by home and foreign firms. This industry can be easily developed as no large capital is necessary to start it on a cottage basis in South Travancore. Depots could be established for circulating the bundles of dyed fibre and the wooden handles and boards. I would suggest that the best way of accomplishing this would be to open two schools, one at Colachel and the other at Kuzhithurai. The functions of these schools would be to give instruction in brush-making to the people. Thus the cottage industry would be maintained by trained and skilled workmen. The schools proposed above could be so arranged as to be also the depots for distribution of raw materials to the surrounding workers and the collection of finished articles. These schools could be kept in touch with the requirements of the market and be ready to teach new designs as required. Whisk brooms, scrubbing brushes, pan brushes, clothe brushes, and ordinary brooms can be made and sold both locally and abroad. The depots should be the intermediary agency with the markets. It will be necessary to employ local carpenters to make the wooden backs and then the rest can be done in the homes of the people. A large number of people can thus be helped. The tools required are few and inexpensive and it would be a good thing if each pupil of the school be given a set of his own. They can all be made locally. In this way people will be enabled and encouraged to make up the industry. A set of tools and a capital of Rs. 20 would be ample to start this as a home industry. While under training, scholarships might be given to the poorest classes for their maintenance. Above all the schools and depots should be worked with the business world and should therefore be carefully guided by the Industries Department in matters affecting the prices and markets. The co-operation of the South Travancore fibre business firms is assured for the enterprise. It should be noted however, that the annual production of fibre is not sufficient to supply the demands in normal times, and consequently steps must be taken now to establish a sure and constant supply of raw material. A large manufacturing

and fibre exporting firm informed me that there was a big shortage in the production of fibre in Travancore and that, if this went on, they would have to bring fibre to Colachel in Native craft from Tuticorin in order to keep their factory working. At present there are over 1500 people in the factories in Colachel alone, not to mention the numerous climbers and others engaged in this industry.

The only way to secure the increase production of fibre is by encouraging the plantation of the palmyra tree, since the best fibre is obtained from the young trees. There are at present many acres of land at the foot of the hills in South Travancore, where the trees may be planted with profit. Assistance could be given by giving help or small concessions to poor ryots for the purpose of planting up these trees. The importance of planting of new trees cannot be over-estimated. The conversion of dry to wet lands has largely decreased the number of trees and also large numbers are being used for timber owing to the scarcity of tappers.

Mat-Weaving and Basket-making.—Side by side with the fibre industry is worked the industry of mat-weaving and basket-making. The palmyra leaf is used to a large extent for this purpose. The mats made out of it are stronger than those made out of screw-pine leaves and are harder in texture. At present Japan supplies India with baskets made out of palmyra leaves. They fetch a good price and find a ready sale in the market. As an experimental measure one of the Japanese baskets was purchased and a similar one was made on that model by a local workman. He did the work so well that it was not distinguishable from the original Japanese article. The cost of making came to 10 As. 6 Ps. but Re. 1 was offered for it. The Japanese article cost us Re. 1-4 and the increase in price was due to superior finish. Skilled basket makers already exist in the State in the Northern Taluks. These people could be used as instructors in South Travancore. This industry of basket making should be properly taught and might be successfully introduced as a cottage industry and with our low price and superior workmanship we can gain the market without any trouble. Recently nearly 1,000,000 square feet of these mats have been exported from South Travancore for war purposes. The mats are usually made in size 4 ft. x 4 ft. and 6 or 7' x 3 or 3½'. The industry at present is not properly organised and has great opportunities before it. In Eraniel and the southern taluks the cottage

workers are numerous. The industry is carried on by the poorest people and Rs. 4 to Rs. 5 can be earned by a woman if she is a good worker. New designs, small cases, baskets, would find a ready sale in outside market, but there is no opportunity given for instruction in these patterns or for the collection of goods for the market at present. A depot will be a great boon and should be for instruction in new patterns as well as for collection of finished products and subsequent disposal of the same. The demand exists in India today and we have already had enquiries for large orders. More can be done if the cottage workers are organised.

Another branch of this industry exists at Eraniel, namely for fan making. Two kinds of fans are available :—

1. Made from the leaf itself, using the leaf-stalk as handle.
2. A folding fan with sides of palmyra wood.

The former are in common use and cost but a few chuckrams whilst the latter are more expensive, but find a ready sale on outside markets. Orders for these have also been received and supplied through our help. A further use has been for writing as a kind of stationery. The writing is done by a stiletto and this is still used in some places as a cheap substitute for paper. The palmyra leaf industry can be easily developed; raw materials are plentiful and cheap, and organisation and instruction are all that are necessary.

A recent discovery has also given a further use for the leaf of the palmyra. It can be easily made into match-boxes and is peculiarly suitable for this purpose. It is thin and smooth, easily cut to shape and strong and thus planing machine is unnecessary for its preparation previous to the manufacture of the boxes. It is hoped that before long a firm will open out in South Travancore for this purpose and the skilled fan makers will be able to take up this lucrative source of cottage employment. The match-sticks can be made from the centre stalk of the cudjan leaves.

Manufacture of Fermented Toddy.—By far the most important product of the palmyra is the saccharine sap which flows from the flower-stalk. It is obtained by bruising the stalk with a wooden instrument so as to crush the embryo flower or fruit within and taking a thin slice off the end for several successive days. About the eighth the sap begins to exude and is received by a little earthen vessel. The inside

of this vessel is smeared with chunnam to prevent the juice from fermenting. The tree is climbed both morning and evening for the sake of bleeding the stalk but the sap, which has collected since the last ascent is usually brought away in the morning only, as but few female and still fewer male trees will fill the chatties attached to them more than once in 24 hours. The quantity of juice usually yielded by a male tree is only two thirds of what is obtained from a female tree, but is said to be sweeter. Much of the unfermented sap is drunk just as it is drawn from the tree, but, the supply being greatly in excess of the demand for it in this particular form still more is boiled into jaggery.

Palmyra toddy is drawn and sold in Eraniel. The trees are previously marked under tax rules. Each shop-keeper is permitted to tap only as many trees as are required for legitimate sale in his shop. The independent shop system with its accompaniment of tree tax has been working in this taluk for the last nine years. The statement given below shows the number of palmyra trees tapped for toddy, in the taluk during the years 1087 to 1092.

1087	2848.	1088	2837.	1089	3015.
1090	2622.	1091	2951.	1092	3019.

The demand and supply have thus been maintained at the comparatively steady figure for the last few years.

Sweet toddy and jaggery.—This is one of the taluks where exemption is granted from the sweet-toddy rules so that it is difficult to obtain any figures relating to the number of trees tapped annually. The total number of palmyra trees in the taluk is about $7\frac{1}{2}$ lakhs. It can be said that about 25% of these are tapped annually. The Eraniel taluk contains the largest number of palmyra trees of any taluk in the State. The sweet-toddy is rendered into jaggery thus—

The sweet juice obtained from the tree is taken by the cottage people and boiled down to make jaggery. Large quantities of this are produced and used for local consumption, but the major portion of it is exported to be made into sugar. The collection of jaggery from the ryots is a simple matter, as it is brought up largely by agents. One point that should be mentioned here is, that the boiling of the sweet-toddy is mostly done by women, but they are now taking to cleaner walks of life such as lace-making. This is another cause of the decline of the industry. At present the

boiling is done in earthen-ware chatties and is a very tiresome process owing to the length of time the person has to maintain a good fire and dirt and smoke involved.

The introduction of lace-making has afforded the women an easier alternative employment in their cottages, which is lucrative and cleaner.

Large quantities of jaggery are obtained in the taluk and these are brought up at the local markets and conveyed to Nagercoil to be drained for molasses preliminary to export for sugar manufacture. In 1092 the weight of jaggery exported, from Padmanabhapuram Division was 1,51,598 cwts. and the export duty realised Rs. 26,531. It will thus be seen that the industry is of the highest importance both to the State and to Franiel taluk. The great trouble here is the decrease in the number of climbers. The Channar community from which the men are drawn has availed itself of education and consequently seek more lucrative and less dangerous employment. With the construction of the Patchipara Dam, much of the dry lands have been converted into wet lands consequently the climbers have become paddy cultivators and thus their original calling is dying out. The removal of labour to tea and rubber estates has also resulted in the diminution of climbers. The recruiting of coolies from amongst the communities has been great. The daily earnings of the climbers vary from place to place. A climber gets from 4 to 8 chs. a day according to skill. In some places he has his salary in kind by claiming the products of the tapping on alternate days. In any case the tapper is supposed to tap 25 trees daily and since each tree has to be climbed twice per diem—morning and evening—he climbs up and down 50 times a day. Taking the average height of the tree as 50 feet, it may be observed that the nature of his calling is very difficult, and the remuneration obtained for his work very meagre. He climbs on the average 2,500 ft. a day.

With the help in Travancore, of a sort of movable girdle to keep his ankles a certain desired distance apart, he clasps the tree with the palm of his hand and the sole of his feet leaning the weight of his body on the latter, and ascends and descends by a series of springs in which first the hands, then the legs or *vice versa* act simultaneously. In this it may also be mentioned that the educated portion of the Channar community induce their brethren, following the profession of climbing the palmyra trees, to take to other more profitable and less arduous walk of life. It is only

such of the members of the community as would otherwise be destitute, that take up the profession of drawing the sweet juice. In these days the general tendency on the part of the communities supplying professional drawers of toddy is to leave the profession so as to elevate themselves in the social scale. A social elevation is what they desire and they find their calling is hard when other opportunities are offered to them by education which will place them on a higher social scale. They readily seize chances of education in order to gain this end and the educated section finds other means of livelihood of an easier nature than climbing trees. The nature of their calling is arduous and dangerous and if the industry is to survive, new methods of tapping should be worked out and employed.

The palmyra industries are all important to this taluk and great attention should be paid to their conservation and development.

Lace making and Embroidery.—Eraniel Taluk is the largest centre for lace making and embroidery in Travancore. The industry is carried on under the auspices of various religious institutions and also by Mrs. Allen, late of the L. M. S. The Roman Catholic community have a large institution at Mulagumudu where over 3,600 people are employed. They are at present building a new branch at Colachel. There is also a vigorous L. M. S. branch at Neyoor. Brief notes on both places are herewith appended.

Neyoor Embroidery School.—At Neyoor and Trivandrum the London Missionary Society devotes its attention to the sister industry of lace making namely embroidery. At Neyoor about 160 workers are attached to the industry. There is a small school where the beginners and new patterns are taught. This school is not State-aided. The earnings of the workers vary considerably and a fine worker who is able to give a good deal of time to her industrial work can earn about Rs. 5 per mensem. The majority however, are not able to earn so much, in fact the pay is exceedingly poor. Living is fairly cheap though the cost is increasing. The sale of goods is maintained entirely by one customer recommending another and the worker in charge, Miss. Blanchard, states she cannot give more time to extend the industry further. It is confined entirely to the Christian Community and if European direction could be found from a central source many other non-christians might be taught this means of livelihood. One of the chief difficulties is the high price of the raw materials.

Mulagumudu Orphanage.—The history of the institution dates properly from the year 1907, when two religious Belgian ladies the Rev. Mother Louise and Mother Ursule arrived to take charge of a small number of orphans gathered together here by a Missionary Rev. Fr. Victor, and committed by him to the care of some native widows pending the arrival of those who may be considered to be the founders of the establishment. All this was to be done, in fact when they arrived to establish their institution at Mulagumudu. They set nobly to work and appealed to the generosity of their parents and friends in Belgium. From them they obtained the sums of money necessary for the construction of the place required for the orphans, the number of which rose from day to day. A few months after their arrival, having conquered the first difficulty of the language, they opened an Elementary School for the children of the village and the district, admitting the orphans as well. Seeing the extreme poverty in which the people surrounding them were living, they saw that yet another thing had to be done to assure the material well-being of many of the families. From them emanated the idea to establish also a technical school where the young girls would be able to learn crochet work, lace-making and embroidery and thus earn for themselves a means of an honourable subsistence. The first attempts were crude and it was necessary to have immense patience to induce these unskilled coolies, used only to running and playing in the open air or lying on their mats without control and without constraint to resign themselves to ply the needle in the necessary manner for several hours daily. The first results were naturally very mediocre, but the time spent and the recompense gained balance each other, when proper and careful work is accomplished. The first wages obtained stimulated the pupils, even the less active ones, and from this moment the applications for admission grew enormously. Some years have passed since then. The work so founded extended in its beneficial action much further. An industrial school has since been established at Cape Comorin in 1908 another at Nagercoil in 1910 and an orphanage at Srivilliputtur in 1911. Here at Mulagumudu there are about 300 orphans admitted at all ages and they remain in this establishment till the time of their marriage. During the time they stay at the orphanage they are given Elementary Education. Those who show special aptitude for study are sent to the institution at Nagercoil where they are able to study through the seven

classes and obtain a diploma from the institute. The others are maintained at the Technical school where they learn several kinds of lace making such as: Torchon, Maltese, Chiny, Bruges, Honiton. The others make English embroidery on tulle etc. The orphans learn to cut out and sew their garments, to prepare food and carry out the other duties of house-keeping. When the girls leave the institution to marry, they receive a dowry a box containing clothing and all the necessary materials to make lace and embroidery for themselves. At present, nearly a thousand people both internal and external have already passed through the school and are working at their cottages. The other women of the surrounding villages have served their apprenticeship in great numbers, so that there are actually at present no less than 3600 persons who are able to make lace, embroidery and thus gain for themselves the means whereby they can live. They are paid according to the work they have completed and are able to earn between 7 to 10 As. per day according to their wish and diligence. Women of this type live sometimes in adversity and misery and are obliged to borrow in order to meet the expenses of their families and to help their meagre lot. Since the foundation of the orphanage, thanks to this new industry, the poor women have a lucrative and easy employment which permits them to manage their family affairs with ease, and allow the latter to live in happiness and free from care. The orphanage and work rooms are excellently equipped. The school is a large and spacious building and the market for the goods is readily found, in fact the orders at present are sufficient to keep the large number of workers in constant employment for the next year and a half. The Mother Superior informed me that further work was impossible at present as the supply of cotton is small, expensive and difficult to get. The staff is fully engaged and very efficient. No Government aid is given to this institution which is entirely self-supporting. The institution has now enough orders in hand to maintain the 3600 workers in continuous work for one year.

The importance of this as a cottage industry lies chiefly in the fact that the women become cleaner and more self-respecting. They have an independent source of income and they remain in their houses to do the work. Bulletin No. 3 of this department deals fully with this question and makes suggestions for its future development.

Weaving.—The Eraniel Taluk is one of the most important weaving centres in Travancore. Some thousands of weavers with their looms are being in the neighbourhood of Neyoor, Eraniel and Palliyadi.

The weaving community here is composed of Sarkaravars, Nairs and Mohamedans. The Sarkaravar community has an interesting history. Tradition states that the community originated from Kaveripoom-patanam a trading centre of the old Chola Kingdom which now comprises Trichinopoly, Tanjore and South Arcot districts. They were here known as the Saiva Chetty Vellalas. The king or ruler of Kaveripoom-patanam is reputed to have borrowed large sums of money from a local Siva Chetty merchant and liquidated his debts by giving his beautiful daughter in marriage to the merchant's son. It was the descendants of this couple that, being disowned by the Saiva Chetty community, developed into a separate and distinct body. Many of the members came to South Travancore and settled there. They were called Kaveripoom-pattanathar, Kaveripattanathar and Kaveriyar successively. They then became confused with the Karthees who were the Channar Barbers. The caste or tribal name of the community was Sackaravarthy and now this is rendered into Sackaravar. Over 3000 of the community are christians. The numerical strength of the community is about 15,000 of which 2000 are L. M. S Christians, 1000 Roman Catholics and 12,000 Hindus. They occupy over 2000 houses. About 12,000 persons or 2000 families are weavers and have been from time immemorial. In pre-war days the average income of a labourer was 5 Chs. and that of a loom owner 8 Chs. These people can be said to form the working portion of the weaving community of the Eraniel taluk. The system on which the industry is based is the same here as in Agasteeswaram taluk and the difficulties are about the same. There are a large number of wealthy shop-keepers and yarn merchants who give out the yarn to the weaver on credit at interest and then take back the finished cloth for sale or export. Thortus, Mundus, Thuppaties, Adiyuduppu, Pudavas, Nariels, Towels, Bed-sheets, Surgical bandages are all woven here. There is no proper organisation of the industry and the earnings and supply of yarn are completely controlled by the merchants.

A statement showing the counts used for weaving in Eraniel Taluk and the purposes for which they

are used is appended herewith. There are many cloth stores and the stocks of yarn held are very considerable, amounting to over one lakh of rupees in value. There is one institution run by private enterprise for the teaching of weaving, named the Neyoor Weaving Institute, managed by Mr. Krishna Pillai.

In this institution 20 boys are instructed and the monthly cost of establishment varies from Rs. 150 to Rs. 200. The yarn used is purchased from local merchants. The income of the business is Rs. 300 per mensem and thus a profit is shown in the working. The usual difficulty is found here in supply of yarn. The remarks on weaving found elsewhere can also be applied to this Taluk.

The Chalayas also form a considerable portion of the weaving community here and more than 100 families are found in Eraniel town alone. They are intimately connected in work and origin with the Vadaseri weavers and similar conditions of working prevail. (Agasteeswaram Report).

The Mohamedan weaving community in the taluk is found near Tiruvancode and Thackalay and numbers about 150 families. They weave coloured cloths chiefly. The weaving industry is of the highest importance in the taluk.

STATEMENT OF COUNTS USED FOR WEAVING IN SOUTH TRAVANCORE FOR VARIOUS PURPOSES.

Count No.	No. of hanks per bundle.	Quality.	Used for.	The fluctuating price before the war per bundle.	The present price per bundle.	The firms from which the variety is obtained.	The difference in price.	Remarks.
14	14	Rough.	Thortus.	From Rs. 3-8 to Rs. 4.	Rs. 16.	Coral Mills Co. Tuticorin.		No. 14 and 16 are used for thortus and are useful for Chalyars.
16	16	Rough white ties.	Do.	Rs. 4 to Rs. 4-8.	Rs. 16.	Do.		
20 I	20	Rough red tie.	Mundu and Thuppatas.	Rs. 4-4 to Rs. 4-8	Rs. 22.	Do.		These are the varieties required.
20 II	20½	Do.	Do.	Do.	Rs.	Do.		But 1 and 2 are more useful and 3 is also important.
20 III	20½	Do.	Do.	Do.	Rs. 21-14.	Kaleeswarar Mills, Co., Coimbatore.	2 As. less than 1 & 2.	
20 IV	20½	Rougher.	Do.	Do.	Rs. 21.	Tinnevelly Mills Co.,	12 A. less than 1, 2, & 3.	4 and 5 are cheaper.
20 V	20	Not very useful.	Do.	Do.	Rs. 21-8.	Madura Mills Co., Ltd.	8 As. less than 1 and 2.	

STATEMENT OF COUNTS USED FOR WEAVING IN SOUTH TRAVANCORE FOR VARIOUS PURPOSES.

Count No.	No. of hanks per bundle.	Quantity.	Used for.	The fluctuating price before the war per bundle.	The present price per bundle.	The firms from which the variety is obtained.	The difference in price.	Remarks.
26	26	White ties are best.	Mundu and Thuppattas.	Rs. 5-12.	Rs. 23.	Coral Mills Co., Tuticorin and Kaleswaram Mills.		This sort is also required but not so useful as 20.
40	10x2—20	Red and yellow ties are best.	Mundu and Adiyuduppu.	Rs. 3-12 Rs. 5-4.	Rs. 16- Rs. 12-8. Rs. 11-4.	Binny and Co., Bombay. Rally Bros. and Coimbatore Mills.		This is another variety which is of next importance.
50	12½	Soft.	Adiyuduppu.	Rs. 4-12 Rs. 5.	Rs. 16.	Binny and Co., Bombay.		This sort is not so useful to the people as others but will be in demand when price goes higher.
60	15	Do.	Do.	Rs. 5-4 Rs. 5-8	Rs. 17½. Rs. 19½.	C. F. Mandlay and Co., Manchester.		This is needed for weaving soft mundu.

STATEMENT OF COUNTS USED FOR WEAVING IN SOUTH TRAVANCORE FOR VARIOUS PURPOSES.

Count No.	No. of hanks per bundle.	Quantity.	Used for.	The fluctuating price before the war per bundle.	The present price per bundle.	The firms from which the variety is obtained.	The difference in price.	Remarks.
70	17½	Glazed.	Nariels.	Rs. 6 Rs. 6-2.	Rs. 9. Rs. 20.	C. F. Mandlay and Co., Manchester.	These 5 counts are very useful and are obtained from C. F. Mandlay and Co. Manchester. Similar productions sent from Japan and India are rough and not so strong. Now Manchester yarn used.	This is like No. 50 and is occasionally used.
80	10 × 2 —20	Do.	Do.	Rs. 6-12 Rs. 7.	Rs. 25. Rs. 27.	Do.		These three varieties are of equal importance these are the necessary counts used to weave
100	12½—2 —25	Do.	Do.	Rs. 8-8 Rs. 9	Rs. 33. Rs. 33½.	Do.		Nariels in Travancore. The chief places of demand are Kottar Eraniel, etc.
120	15—2 —30	Do.	Do.	Rs. 10 to Rs. 10½.	Rs. 35.	Do.		There are many other sorts also but these three are the best and the colours are fast.
140	10—2 —20	Jegajotti Red.	Pudavas.	Rs. 4-12 Rs. 5.	Rs. 15.	Mostly from Madura and Madras.		
Do.	Do.	Alkarappu.	Do.	Do.	Rs. 14½.	Do.		
Do.	Do.	Vidamanjal.	Do.	Do.	Rs. 14½.	Do.		
Gold lace.	Marks. 8		Nariels Adiyuduppu.	Rs. 30	Rs. 160. Rs. 87.	France.		

Brass-Workers.—There is a large Mahomedan community established in around Tiruvancode. It is here that brass workers live in large numbers, in fact it is the staple industry of the place. The articles made include lamps and all kinds of culinary utensils as well as domestic vessels. A large trade is carried on with the neighbouring places and the goods are exported as far afield as Trivandrum and Quilon. The average brass-worker gets 8 As. to 10 As. per day and here there will be some hundreds of them. Living is comparatively cheap, and the ready markets for their goods assist them to maintain themselves fairly easily. The brass is obtained from scraps bought locally, old vessels and the like. Formerly brass from Tinnevely, *via* Nagercoil was brought by them. The usual methods of manufacture are in vogue here *via* burnt earthenware clay and cow-dung moulds with wax inside to be supplemented with molten brass. A large amount of beaten brass and copper work is also done. Copper vessels are also made and it is possible to buy bowls of beaten copper or brass at reasonable rates. This is a very old established industry here and is capable of expansion and improvement.

Fishing and Fish-curing.—There are more than 10,000 fishermen in this taluk. Their fishing instruments are catamarans, boats, and nets. The average income of a fisherman from this industry is Rs. 6 a month and this is barely sufficient for the maintenance of one family. There is a fish-curing yard at Muttom, the only one of its kind in Travancore. Pit curing is the most common method followed by the fishermen. The present system is insanitary and involves waste of salt. The better method of dry curing does not find favour among the fishermen. In the Government fish-curing-yard at Muttom dry-curing alone was allowed and very few fishermen went to the yard. Improvements are being made by the substitution of wooden tubs for pits. In 1092 there were 23 licensed curers and about 4370 maunds of large fish and 1870 maunds of small fish were bought for curing and cured in the yard for export.

Salt-Manufacture.—This industry is under the management of the Excise Department. The factory is situated at Colachel and covers an area of 89·71 acres. The pans occupy 46·9 acres of which 40·74 acres are for manufacturing purposes. The extent of waste pans is 6·16 acres. The out-put

of the factory in 1092 was 15,484 maunds, averaging about 379·18 maunds per acre. The annual rain-fall was 32·85 inches.

Tile and Brick-works.—Six factories or more are found where tiles and bricks are manufactured, one in Karangavu, one at Mullivila, one at Neyoor, one near Colachel and two near Mulagumudu. The one at Neyoor was started on a large scale with power machinery and other equipment, but owing to lack of working capital, it did not work well and has now ceased altogether, the machinery lying idle. The others are carried on without any elaborate machinery and they supply the local needs. Good clay is found in quantity. When there is pressure of work, 50 to 100 coolies are employed in each factory. The wages of these coolies are estimated at from 3 As. to 6 As. a day. There is scope for a big tile factory in this taluk and the facility with which they could be exported by native craft from Colachel to Ceylon would assure a market for a good article.

Toy-Making.—Toy-making is carried on a small scale. Coloured clay models of fruits and fancy fans are made and sold locally. This industry needs development on a cottage basis. Many people are already skilled in the work, but want new patterns and wider market.

Comb-making.—Several Mohamedans in the taluk make combs out of horns, bones, etc. At the present time this is a small industry and only local demands are met. This industry can be encouraged and developed by the introduction of hand-machines for combs. The raw material can be obtained easily and the workmen are already skilled. Snuff-boxes and other small things are also made in small quantities and they find a ready market locally.

Coir-industry.—The chief difficulty in the taluk is want of soaking facilities. At the present time coir making is carried on a small scale and coir is sold locally. The introduction of coir extractors will greatly help this industry. With the abundance of palmyra fibres a brush factory can be started. The whisks from a coir extractor can be also used for the purpose.

Aloes.—Large quantities of Elephant Aloes are found in the taluk. The leaves are cut at the proper time, soaked in water, preferably in running water, and the fibre extracted

by beating with a mallet. It is bleached white in the sun. Ropes, twines, beltings, mattings, etc., are all made out of it. This industry will become a thriving one as soon as shipping is normal. Systematic planting, introduction of fibre extracting machines are all required. Experiments have shown that by chemical treatment the fibre can be softened and gunny substitutes and other products can be made out of it. Large quantities have been bought by Messrs. Vavasseur and Co., Ltd., and made into netting ropes and belting, etc. They have also large orders for export.

Lime Burners.—All along the coast lime burners are found gathered together at particular places in groups of 3 to 5 families. The shells are gathered from the sea bottom and the beach also. The kiln itself is made of mud and lasts six months. It costs Rs. 3 to construct. Charcoal and coconut husks are generally used as fuel and a mechanical blower is attached and driven by a wheel and a rope to keep an air current through the kiln. The total outlay for each kiln including blower is Rs. 20. Usually lime burning is done in the same kiln 2 or 3 times each week, but work is spasmodic and many of the burners only work when required to do so. The kilns are about 6 ft. in diameter and 3 ft. high as a rule. To fill it the cost of shells varies from 8 to 10 fanams and the fuel used costs Re. 1. It burns for 24 hours and the product is worth Rs. 2/8 to Rs. 3. The average monthly income of such workers varies greatly with the diligence of the worker and the demand for the goods. Rs. 5 to Rs. 7 is a good average estimate of their monthly earnings. The shells are usually gathered by the burner himself who thus obtains his raw material for the price of his labour.

Brush-making.—The question of brush-making has already been attempted by Messrs. Vavasseur and Co., who made a quantity for export to Australia. They were exceedingly good. Brooms in the Monazite Factories were also made locally. The local carpenters make the backs of the brushes and the handles, whilst the artisans make the fibre part. This industry is one which will certainly thrive here since local raw materials are so cheap. Bristle fibre from coconut, is also available and large quantities of palmyra fibre now collected would be utilised. There is no doubt that this is a great possibility for Colachel people.

Economic Statistics.

More than 15,000 men are engaged in agriculture and in other walks of life and more than this number are found. The workmen are set out as follows:—

Carpenters.	100 families.	6 As. to 12 As. a day.
Masons.	About 100.	8 As. a day.
Blacksmiths.	50 families.	Contract work, earns 12 As. to Re. 1 a day.
Weavers.	3000 families.	Earn from 5 Chs. to 8 Chs. a day.
Toddy drawers etc.	Some thousands.	Earn 8 Chs. a day.
Lace and Embroidery workers.	Some hundreds.	Rs. 3 to Rs. 4 a month for spare time work.
Oil Mongers.	Some hundreds.	4 As. to 8 As. a day.
Fishermen.	Some thousands.	6 Chs. a day.
Coolies.	Some thousands.	5 Chs. to 10 Chs. day.
<i>Cost of Living.</i>	Cultivator's family.	Rs. 25 a month.
	Cooly's family.	Rs. 4½ to Rs. 6 a month.
<i>Number in Family.</i>	Cultivator's family.	5 persons,
	Cooly's family.	3 to 4 persons.

Co-operation.

No co-operative societies are yet in existence in this taluk.

Joint Stock Companies.

<i>Name of Company.</i>	<i>Capital.</i>	<i>Paid up.</i>
The S. Travancore Weaving and Spinning Co., Ltd., Neyoor.	Rs. 8,000.	Rs. 3,575.

Capital and Remarks.

The total joint-stock capital subscribed is Rs. 8,000 of which only Rs. 3575 are paid up. No co-operative capital exists in the taluk. The large factories are almost entirely run by European capital. Weaving is entirely Indian. For the development of weaving a co-operative depot is necessary. There is plenty of local capital in the taluk and if Indian gentlemen here unite and come forward there is ample scope for industrial development.

DEVICOLAM TALUK.

Area—625·52 sq. miles. Population.—21,270. No. of Pakuthies.—11.

Taluk town.—Devicolam.

Location.

Division.—This taluk forms the northern portion of Devicolam Division.

Boundaries.—*North*—Coimbatore district. The Chinna Aur and its tributary divides the taluk from Coimbatore.

South—Peermade taluk.

East—Madura district.

West—Todupuzha and Muvattupuzha taluks.

Railway.—There is a rope-way in the taluk. A light railway reaches up to Munnar from Yellampatty. This is the most important means of communication. Pollachi is the nearest railway station and is 53 miles from the taluk. Alwaye railway station is also utilised for transport.

Backwaters and Rivers.—This taluk is mountainous and has no backwater facilities. The Periyar and its tributaries are the most important rivers. The Chinna Aur and the Pampa Aur flow in the north.

Main Roads and Village roads.—The only road of importance is that which leads to Munnar, which is connected due north to Udumalpet. There are many other roads leading to the different estates, but many of these are under private management.

Cultivation.

Wet land.—3597 acres. Dry land.—34,331 acres.
Unregistered land.—210,479 acres.

Pakuthies.

Name of pakuthy.	Area.	Wet land.	Dry land.	Unregistered land.
	Sq. miles.	Acres.	Acres.	Acres.
Keolandur ...	26.25	783	83	2393
Natchivayal ...	5.78	558	474	2563
Marayur ...	35.76	866	103	21405
Kantalur ...	18.60	786	81	10647
Kottakombu ...	13.86	134	16	8736
Vattavadai ...	12.21	381	97	7345
Kannan Devan Hills ...	214.74	...	...	...
Pooppara ...	99.36	...	...	...
Udumpanchola.	197.40	9	19091	45394
Pallivasalestate.	1.34	...	14417	111998
Anakulam estate ...	23	...	...	...

Education.

There are four L. G. Vernacular Schools in which more than 48 pupils are in attendance.

Natural Products and their present utilisation.

Paddy.—Paddy is grown in Kanthallur, Kilanthur, Marayur, Natchivayal, Vattavadai, and Kottakambur pakuthies. The local produce is not sufficient for local consumption and so rice is imported.

Wheat.—Wheat is grown to some extent in Vattavada pakuthy.

Ragi.—Ragi is grown fairly largely in almost all the pakuthies. This is consumed by the poor people in the locality.

Tea.—Tea is largely cultivated in Pooppara, Kannan Devan Hills, and Pallivasal estate. Large quantities are exported.

Coffee.—Coffee is cultivated in Vattavadai, Kottampur, Natchivayal, Pooppara and the Kannan Devan Hills. It is exported mainly to Madura.

Rubber.—There are many rubber estates in the taluk of which Anakulam and Kannan Devan Hills are most important. The manufactured product is exported to Europe, America, and Ceylon. The estates have modern power factories.

Other products.—Potatoes, garlic, plantains, sugar-cane, camphor, and cinchona. Large quantities of sisal hemp are grown in Kannan Devan Hills. The fibre is extracted by machinery and exported. In Kannan Devan Hills, oranges, apples, and pears are obtained. Several kinds of resinous trees are found here. Mulberry grows well in the Kannan Devan Hills. Plenty of castor plants are obtained in Kottampur, Vattavada and Kanthalur, Kilanthur, Natchivayal and Marayur pakuthies.

Minerals.

Mica.—Mica is found in certain localities in Kannan Devan Hills. The mineral value is at present largely unknown. Peat is found in several places.

Existing and Possible Industries.

Agriculture.—Agriculture is the main industry of the taluk. Paddy cultivation, rubber, tea, coffee, cardamom and other plantations are the most important. There are about 3,000 agriculturalists and some thousands of coolies working in the plantation. In Kannan Devan Hills the cooly wages come to 8 As. a day.

Power.—There is electric power station in Kannan Devan Hills and supplies power to the factories and also for lighting etc.

Tea.—Manufacture of tea is carried on in a large scale in some factories. The tea is packed and exported.

Fibre Industry—Sisal hemp fibre is extracted in large quantity in Kannan Devan Hills. It is exported to Europe and other places.

Estates.—The most important among the estates in this taluk is the Kannan Devan Hills Produce Co., Ltd. This company has 24 estates under its management. Rubber and tea plantations are the most important. The general manager of the company is Mr. H. L. Pinches. The estates under him have a separate manager. The company has an engineering department which is managed by one chief engineer and

two assistant engineers. The Anglo American District Tea Trading Co., Ltd., has plantations of tea in Periyakanal, and Pallivasal, each under separate management.

The other estates are found in Talliar, Devicolam, Surianalle and Bodinayakannur. The Malayam Rubber and Produce Co., has three estates under it, situated in Devicolam and Surianalle. Mr. E. L. Williams, has 4 estates in Talliar and Mr. T. R. Lekshmana Singh has the same number in Talliar. There are two estates in Bodinayakannur under Mr. A. S. Suppen Chetty. The Travancore Produce Co., Ltd., has one estate in Surianalle. The vast quantities of tea and rubber produced are exported largely *via* British India. A forest trainway for passenger and transport services has been installed. The whole area is up to date in industrial appliances. The area has not been surveyed yet by me and the figures etc., now quoted, are due to the Commissioner of Devicolam. It is hoped that a complete record will be published later as a separate appendix. Cardamoms are also exported in large quantities.

Foodstuffs.—Rice, ragi, wheat, potatoes, and plantains.

Economic Statistics.

The total number of labourers is 19,148. The skilled artisans are set out as below :—

Carpenters	527	Re. 1 a day.
Masons	520	12 As. a day.
Coolies	Some thousands	6 As. to 8 As. a day.
<i>Cost of living.</i>	Cultivator's family.	Rs. 15 a month.
	Single person.	Rs. 5 a month.
	Cooly.	Rs. 4 to Rs. 5 a month.

No. of Voters. 39.

Co-operation.

There is no co-operative capital in the taluk.

Joint Stock Companies.

	Authorised. Capital.	Subscribed. Capital.	Paid up. Capital.
The Munnar Supply Association Ltd., (To carry on the busi- ness of a co-operative store in all its bran- ches.)	Rs. 45,000	Rs. 25,000	Rs. 25,000
The Munnar Indian Co-operative Store Ltd., (To deal in goods, stores, etc.,)	Rs. 8000	Rs. 8000	Rs. 8000

PEERMADE TALUK.

Area—628·00 sq. miles. Population—58,570.

No. of pakuthies.—10. Taluk town.—Peermade.

Location.

Division.—It forms the southern portion of Devicolam Division.

Boundaries.—NORTH.—Todupuzha taluk, Devicolam taluk and Madura district.

SOUTH.—Chengannur taluk.

EAST.—Madura district.

WEST.—Tiruvella, Changanacherry,
Kottayam and Minachil Taluks.

Railway.—Alwaye, Punalore and Kottarakara are the nearest railway stations to the several portions of the taluk.

Backwaters and Rivers.—The Periyar river, the Manimala river and the Poonjar have their sources in the taluk. The Periyar lake in the south is dammed near Mount Estate. It is a hilly district and has no backwater facilities. In Milappara pakuthy water communication is possible for 20 miles.

Main roads and Village roads. The most important road is that from Kottayam to Peermade and Periyakulam. The other roads are only small ones leading to the estates from this. A road runs from Mundakayam to Erattupetta and Pala. This is also a good cartable road. The Mundakayam Transport and Ropeway Co., run a regular daily service of motor waggons from Kottayam to Mundakayam. From thence a ropeway is being constructed to Peermade and will soon be working. This will greatly facilitate the transport of estate goods. The tea and rubber is usually conveyed to Kottayam by motor and from thence by boat to Cochin for shipment.

Nearest seaport.—Alleppey is 35 miles from Manimala pakuthy. The produce is mostly shipped *via* Cochin.

Cultivation.

Wet land area—784 acres. Dry land area—200,743 acres.
Cocoanut area—16,757 acres. Unregistered land area—
225,584 acres.

Uncultivated land area—161,660 acres.

Pakuthies.

Name of Pakuthy.	Area	Population	Wet land.	Dry land.	Coco-nut land.
	Sq. miles.	Persons.	Acres.	Acres.	Acres.
Manimala.	13.50	1990	52	5028	3500
Cheruvalli.	4.34	2280	...	2776	2000
Chirakkadavu.	10.56	2300	...	6944	4000
Kanjirapalli.	101.22	30370	19	64688	4000
Punjar.	80.79	...	...	50921	3000
Peruvanthanam.	49.88	3800	...	30734	257
Peermade.	124.18	10180	..	19775	...
Periar.	98.20	1380	334	4086	...
Vandamettu.	116.24	930	328	15657	...
Mlappara.	61.40	360	...	134	...

Education.

GOVERNMENT VERNACULAR SCHOOLS.

No. of H. G. Schools, 2.	587 boys.	29 girls.
No. of L. G. Schools, 8.	936 „	279 „

AIDED SCHOOLS.

No. of H. G. Schools, 1.	155 boys.	81 girls.
No. of L. G. Schools, 12.	639 „	301 „

GOVERNMENT VERNACULAR SCHOOLS FOR GIRLS.

No. of L. G. Schools,	3	392 girls.

ENGLISH SCHOOLS.

Government L. G.

School	1	3 forms	123 boys.

Unrecognised L. G. Preparatory

School	1	Class.	27 „	7 girls.

There are no industrial schools in the taluk.

Natural products and their present utilisation.

Paddy.—Paddy is grown on a small scale in the taluk. In the Periyar and Vandampetta pakuthies alone, paddy cultivation is carried on a fairly large scale. Even then the area under it in each of these places is only about 350 acres. The total acreage under paddy is 784 acres only. Rice and paddy are imported from Cochin and Alleppey in quantity for consumption on the various estates..

Tea.—Tea is one of the most important products of the taluk. There are over 20 large estates growing tea. The tea is prepared, packed and exported to Europe and other places, in factories on the several estates. In Mundakayam district there are more than 2000 acres of tea plantations and in Peermade there are many more thousands of acres. The factories are well equipped with power machinery and the fuel is obtained locally. From all estates the total quantity of tea exported from Travancore in 1092 was 1,86,74,405 lbs. valued at Rs. 1,18,73,748. These figures give some idea of the importance of the industry.

Rubber.—The chief district for rubber is Mundakayam and a brief note on the industry is appended herewith:—

The district of Mundakayam lies at a point 33 to 37 miles, almost due east of Kottayam at the foot Hills of Peermade Range which in turn form a spin of the High Ranges or Kannan Devan Hills. It is the largest rubber growing district in Travancore and comprise over 13,000

acres of European owned rubber in practically one block. There are also one thousand acres of tea planted generally on the higher slopes, but this product is climatically less favoured than rubber and is never likely to become an important industry in the district.

The introduction of rubber was first made in 1094 when Mr. J. J. Murphy pioneered the district and planted about 100 acres. In the same year Eldorado and Vellandam were opened, so that at the beginning of 1905, there were some 225 acres planted. From this date the growth of the district was rapid as the following figures will show—

1905	800	acres were planted.
1906	2220	...
1907	2250	...
1908	1785	...
1909	375	...
1910	1300	...
1911	1500	...
1912	1000	

There were of course the boom years and the rapid fall in prices experienced in 1912 probably explains the cessation of planting, for in the six years 1913—1918 only some 500 to 600 acres have been put down. Mr. Murphy was also the first to plant tea, putting down 78 acres in 1910. In the same year Mr. W. B. Kirk planted 88 acres of tea on Peruvanthanam. Different kinds of rubber were tried but the para rubber has been found to be the most successful. The early success of the industry has led the Indian cultivators to follow the example of the Europeans and as early as 1913 there were some 2000 acres of rubber owned by the Indians in the district. Since then there has been a rapid extension and there are now fully 6000 acres in the tract between Kottayam and Mundakayam, while the total area of the rubber owned by Indians in Travancore must be nearly 10,000 acres.

The district lies in the wet zone and has a heavy rainfall averaging 180 inches or more per annum. Recently the average has been inclined to increase, the rainfall in 1915 reaching on one estate 250 inches. In 1917 nearly 200 inches were registered in some parts. The bulk of this rainfall is in June, July and August, these months giving as much as 50 to 60% of the rainfall. It is found out that this has a great effect on the yield of latex, and a more even monthly

distribution of rain would place the district in the forefront of rubber producing countries. It is true that March, April, May, September, October, and November invariably produce fair showers, but the three months of generally complete drought in December, January and February must adversely affect growth and yield. The temperature varies from 70 to 90 degrees F. reaching sometimes in the hot weather to 100 degrees F., but this is rare and the heavy rainfall naturally keeps the air moist with the result the climate for the nine months of the year is steamy. It is not however, unhealthy due probably to the felling and opening up of jungles previously noted for their fevers and general unhealthiness.

The excellent reputation which the Travancore Government has attained in the matter of roads and communications is verified here, and the district has never had much difficulty in finding transport over good roads for the export of its produce. The main outlet into British India, known as the Kottayam—Kumili roads cut the district almost in halves, finally linking up at the 71st mile with the road running through the Cumbom valley to Amayanayakannur or Kodaikanal Road Railway Station. This station forms the outlet for the eastern end of Peermade, but the estates at the western end use the road *via* Mundakayam to Kottayam whence transport is by backwaters to Cochin. In the early days, the produce of the district was carried exclusively by bullock carts and this form of transport is still largely in use, for its cheapness. Its unreliability, however, led to the formation in 1912 of a syndicate of planters who placed on the road a fleet of motor lorries and this syndicate has developed into the Mundakayam Peermade Motor Transport and Aerial Ropeway Co., Ltd., a company now occupied in linking up Peermade and Mundakayam by ropeway so that before long tea from Peermade may be sent direct to Kottayam by ropeway and lorry.

Development in rubber, if any, must necessarily take place westward, and it is the opinion of many that the tract immediately westward of Mundakayam will prove more suitable for the cultivation of rubber than even Mundakayam has done. There is then ample room in the immediate neighbourhood for expansion, if not in rubber, then in some new product. In 1092, 34,02,134 lbs. of rubber were exported from Travancore having a total value of Rs. 65,57,402. The immediate need of the rubber industry

in Travancore is scientific investigation of diseases and proper advice. The European Planter's Associations are already moving in the matter to secure a Mycologist but when thousands of acres of Indian owned estates are in close proximity it is essential that similar investigations and preventations for disease be undertaken for them also. The idea of the smaller plantations becoming disease nurseries is a real danger and united effort to preserve this valuable industry is highly necessary. At present there are over 30,000 acres of rubber growing in Travancore. Of this probably 26,000 acres are mature and giving an average yield of 200 lbs. per acre. The total crop per annum is thus 5,200,000 lbs. of dry rubber. Roughly a gallon of 99% Glacial Acetic Acid will co-agulate 2000 lbs. of dry rubber. This gives a consumption of 2600 gallons per annum in Travancore alone. The pre-war cost of 99% glacial was Rs. 6 per gallon. It is now Rs. 25 per gallon. The total outlay at present is therefore 65,000 rupees per annum. If cocoanut shells are distilled for the acid in a small still actual experiment showed that 45 lbs. of shells yield $7\frac{1}{2}$ lbs. or $\frac{3}{4}$ gallons 10% crude acid. The resulting charcoal weighed 13 lbs. and the other products were rejected. Even then the cost of production was less than 3 As. per gallon for a 5% solution such as is used for coagulation against $4\frac{4}{5}$ As. as pre-war price. The demand is assured and the industry should certainly be taken up locally.

Coffee.—Coffee is cultivated on a very small scale and very little is exported. The beans are prepared and exported. The price of coffee is Rs. 11 per bushel. About 1,94,400 lbs. of coffee were exported in 1092 from Travancore.

Cardamoms.—Large plantations are found in Vandampetta, Peermade, Milappara and Periyar pakuthies. The product is dried and exported to European and other places. The cardamoms were collected and exported for the extraction of oil. In 1092, 5717 cwts. of cardamoms were exported valued Rs. 6,20,852 from Travancore.

Pepper.—Pepper is cultivated in Periyar, Manimala, Kanjirapally and Cheruvalli pakuthies, in large quantities. The product is dried and exported to Europe and other countries. The cost of pepper here is 245 rupees per candy.

Tapioca.—Tapioca is cultivated in Peermade, Kanjirapally, Manimala, Peruvanthanam and other pakuthies. The

quantity grown is only for local consumption. The poor people live upon this as their chief foodstuff.

Forest products.—Gall-nuts, Forest trees, jack, mango, and many other things.

Other products.—Plantains, pine-apple, ginger, arrow-root, etc. These are grown only in small quantity. Kambu is cultivated in Vandampatta pakuthy in quantity.

Minerals.

Graphite.—Graphite is found in Manimala, Mundakayam, Kanjirapalli and Cheruvalli. These deposits have not been fully investigated.

Pyrrhotite.—Pyrrhotite is found in Kanjirapalli, certain hills in Permade and Kumili. It has not been fully investigated.

Mica.—Excellent deposits of mica and graphite are found on the estates in Mundakayam. The value is not yet fully known but is considerable.

Existing and Possible Industries.

Agriculture.—This is the main industry of the taluk. Paddy, rubber, tea, coffee, cardamoms and pepper are the chief crops produced and these engage a major portion of the people. The labourers in these plantations may be roughly estimated at 11,000. The daily earnings of a skilled labourer is between 8 as. to 12 as. a day. The several estates recruit coolies from the plains and they are well treated and well paid as a rule.

Rattan and Basket-makers.—There are about 100 persons engaged in mat and basket making. The raw products are got from the forests. The finished articles are sold locally.

Foodstuffs.—Rice, tapioca, cocoanut, kambu, vegetables, and plantains.

Economic Statistics.

Most of the people are engaged in the cultivation of tea, rubber, cardamom and paddy. The artisans are classified as below:—

Carpenters	about 200	12 as. to Re. 1/a day.
Masons	„ 80	Rs. 15 to Rs. 20 a month.
Blacksmiths	„ 30	Rs. 15 a month.
Rattan and Bamboo makers	„ 100	Rs. 7 a month.
Coolies	some thousand	5 to 10 Chs. a day.

In addition there are many engine drivers, fitters, and mechanists on the several estates.

Cost of living.

Cultivator's family Rs. 2 a day for a family of 7 members.
Single person 10 Chs. a day.
Cooly's family Re. 1 for a family of 10 members.
No. of Voters. 42.

Co-operation.

There are no co-operative societies in existence in the taluk.

Joint Stock Companies.

	Authorised capital.	Subscribed capital.	Paid up capital.
The Travancore Cardamom Co., Ltd., Kanjirapalli.	Rs. 3,00,000	Rs. 39,285	Rs. 37,991
The Twyford & Ashley Estate Ltd., Peermade. (For cultivation of rubber, tea, pepper, etc.)	Rs. 6,00,000	Rs. 4,92,900	Rs. 4,92,900

Capital and remarks.

The total subscribed capital is Rs. 5,32,185. The capital used for development of tea and rubber industries is largely European, although one or two well run Indian Estates are also found. Further plantation of rubber westward and an investigation of minor products is necessary. Aloe fibre could be produced from many of the boundary hedges of estates. Tapioca would grow in many places. One of the chief troubles is the utilisation of fuel reserves and the planting of fuel trees could be undertaken, in some of the disafforested areas with advantage. There is ample room for improvement of the local roads and the district could be opened up for new plantations by this means. With careful scientific advice this district will become a tremendous source of wealth to the State.

AMBALAPUZHA TALUK.

Area.—11,574 sq. miles. Population,—1,12,870 persons. No. of houses,—20,981, No. of pakuthies,—10. Taluk town,—Ambalapuzha.

Location.

Division.—This taluk forms the northern most portion of Quilon Division.

Boundaries.—NORTH.—Kottayam and Shertallai taluks.
SOUTH.—Karthigapally taluk.
EAST.—Chengannur and Tiruvella taluks.
WEST.—The Arabian sea.

Railway.—The two railway stations at Ernakulam and Quilon are almost equal in distance, being 49 miles from Alleppey.

Backwaters and Rivers.—The Vembanad lake occupies the northern portion of the taluk and extends as far south as Puliyankunnu. A canal connects it with the Kayankulam lake. The Manimala river passes through the taluk and falls into the Vembanad lake. It is navigable for a long distance. The means of communication by water are good throughout the taluk. Regular motor boat services run between Alleppey and Quilon, between Alleppey and Cochin and Kottayam. Direct backwater communication is possible with almost all parts of the State.

Main Roads and Village Roads.—The most important road is that from Alleppey to Ambalapuzha, which is cartable. The other village roads are not fit for cart traffic.

Nearest seaport.—Alleppey is the most important seaport in the taluk and in the State of Travancore. It is a big commercial and industrial centre and a large export trade is carried on from here. Alleppey is equipped with a good pier and port offices. The Principal Port Officer for Travancore resides here. Large steamers call here regularly.

Cultivation.

Wet land area.—39,831 acres. Dry land area.—12,997 acres. Unregistered land.—11,361 acres. Uncultivated land.—11,278 acres. Cocoanut land area.—12,997 acres.

Pakuthies.

Name of Pakuthy.	Area.	Wet land.	Dry land.	Cocoanut land.
Talavadi	6.06 sq. miles.	2430 acres.	737 acres.	737 acres.
Kozhimukku	10.42 "	4090 "	539 "	539 "
Takazhi	12.33 "	4290 "	572 "	572 "
Purakkadu	8.86 "	1752 "	1882 "	1882 "
Ambalapuzha	9.05 "	3107 "	1686 "	1686 "
Nedumudi	8.51 "	3291 "	396 "	396 "
Chambakkulam	5.50 "	2529 "	261 "	261 "
Pulinkunnu	19.22 "	8451 "	1085 "	1085 "
Kainagari	16.38 "	5088 "	468 "	468 "
Alleppey	19.41 "	4802 "	5371 "	5371 "

Education.**GOVERNMENT VERNACULAR SCHOOLS.**

No. of H. G. Schools, 8. 2170 boys. 253 girls.

No. of L. G. Schools, 28. 2279 " 958 "

AIDED SCHOOLS.

No. of H. G. Schools, 2. 558 boys. 59 girls.

No. of L. G. Schools, 27. 1366 " 641 "

UNAIDED SCHOOLS.

No. of Schools, 15. No. of Pupils, 740.

GOVERNMENT VERNACULAR SCHOOLS FOR GIRLS.

No. of H. G. Schools, 2. 452 girls.

No. of L. G. Schools, 3. 486 ...

AIDED SCHOOLS.

No. of H. G. Schools, 2. 399 girls.

No. of L. G. Schools, 5. 832 ...

ENGLISH SCHOOLS.**GOVERNMENT.**

No. L. G. Schools, 2. 151 boys.
5 girls.

AIDED SCHOOLS.

No. of H. G. Schools, 3. 1457 boys.

12 girls.

No. of L. G. Schools, 3. 316 boys.

21 girls.

ENGLISH SCHOOLS FOR GIRLS

GOVERNMENT.

No. of L. G. Schools, 1. 111 girls.

AIDED SCHOOLS.

No. of L. G. School, 1. 157 girls.

INDUSTRIAL SCHOOLS.

St. Joseph's Technical School, Alleppey. 33 pupils.
3 teachers. Drawing, Lace-making, embroidery and net-work are taught.

Natural products and their present utilisation.

Paddy.—Paddy cultivation extends over an area of 39,831 acres, all of which is single cropped. The produce of the soil is husked both in the mills and in the local wooden mortars and consumed locally. Paddy is exported to Thiruvella and other places and it is also largely imported from Burmah. Alleppey is the centre for distribution of paddy to other parts of Travancore. The imported rice and paddy is sent by backwater to all other parts of the State.

Cocoanut.—There are more than 7 lakhs of cocoanut palms in the taluk and the area under cocoanut plantation can be estimated at 13,000 acres. The nuts are cut when ripe and sold to merchants or copra makers. Most of it is exported as raw nuts, oil and copra. The husks are soaked in the backwaters and beaten to extract fibre. It is sold either as coir yarn or as fibre to firms in Alleppey for export. Most of the coir and copra are exported from Alleppey. The most important cocoanut producing pakuthies of the taluk may be mentioned Alleppey, Purakkadu, Ambalapuzha and Pulinkunnu. Undoubtedly, this is a most important cocoanut area. The backwaters give excellent soaking facilities and the ready means of export of the yarn is a great help. The large factories for coir are described later. There are large copra drying yards also along the backwaters banks.

Tapioca.—Tapioca is very little grown in the taluk.

Arrowroot.—Arrow-root is grown fairly largely in Kozhimukku and other places, but it is cared for very little. Some of it is however collected, dried and exported to Alleppey. As a cottage industry arrow-root flour is made and sold in the local bazaar.

Plantains.—Plantains are cultivated largely fairly all over the taluk. The fruits are collected and consumed locally. Large quantity of the fruit is imported to Alleppey from Changanacherry every week.

Other Products.—Arecanut, jack, mango, tamarind and pinnay are grown in a fair quantity in all parts of the taluk. The products are however not sufficient for local consumption and hence more are imported.

Minerals.

No mineral worthy of note has yet been found in the taluk. There is large amount of clay obtainable for pottery.

Existing and Possible Industries.

Agriculture.—This is an important industry. Paddy cultivation and cocoanut plantation are the most important items of cultivation. The paddy cultivation is the occupation of some thousands of people. There is only one crop in the year and the rest of the time is spent by the people in their cocoanut topes. In many parts of the taluk, pumping installations are found for removing water from the fields and many are engaged in such installations. Oil and steam engines are commonly used for the purpose. Some thousands are employed in the work of cocoanut topes. The average earning of an agricultural labourer is from 6 to 8 as. a day. The average income of a landlord is Rs. 3,000 a year at the least. There are about 200 landlords in the taluk.

Rice Hulling.—A large quantity of paddy imported into Alleppey is hulled in mills. Several such mills are in existence and the industry is thriving. The system of buying paddy and hulling it and selling the rice, is the most common in these mills, but at times persons and merchants take their own paddy to the factory and get it hulled. They pay certain charges for the purpose.

Cocoanut Industries.—There are many cocoanut firms carrying on industries on a large scale in Alleppey, and in addition smaller local merchants also make copra and coir as cottage industries in all parts of the taluk. The number of such persons can be estimated in thousands. An account of the work of some of the leading firms will give an idea of the extent of these industries.

Messrs. Walker & Co's. Works at Alleppey.—The industrial works contain four departments *e. g.*, Coir yarn department, Coir mats and matting department, the produce department and carpentry department.

Coir yarn department.—The coir yarn is sorted to colour and size, rehanked, bundled, matched and pressed into 3 cwt. bales for export. 21 skilled artisans and 214 coolies are employed in this department.

Coir mats and Matting Department.—These are woven in looms and about 58 skilled workmen are employed. They are assisted by 40 coolies.

Produce Department.—This includes preparation of shipment of all Travancore produce such as rubber, pepper, ginger, nux-vomica, cardamoms, turmeric, tea, copra, poonac, coconut oil and lemon-grass-oil. There are three skilled artisans and 30 coolies employed in this department.

Carpentry.—The work of this department is to manufacture looms, furniture and other purposes also. There are five skilled artisans employed in it. The wages of a skilled artisan range from Re. 1 to Rs. 2 per day and those of a cooly from 4 As. 9 P. to 12 As. a day. There is no power engine and all matting and others are worked by human labour. Their coir yarn is pressed elsewhere and coir mats are sheared in other places. The monthly out-turn of the factory is 50 rolls of coir matting, 50 dozen coir mats, and 400 and three cwt. bales of coir yarn.

Coir yarn and fibre are brought to their place by valams from Vycome, Alapat, Anjengo, Aratory and other coir yarn producing districts. 250 candies of the matting are consumed every month. The number of hours of work in the factory is nine hours a day.

Messrs. William Goodacre & Sons., Ltd., are a firm dealing in every variety of produce of this coast but principally in coir yarn and the various commodities manufactured therefrom. The coolies employed by the firm vary in number according to the season of the year from 400 to 1200.

Messrs. Ripley & Mackay.—This firm exports coir and general produce. They have a press for baling coir yarn and manufactured coir mats, ropes, etc. They have a large number of looms working in their factory. Two hundred men, women and boys are employed daily.

Messrs. Volkart Bros., Agency.—Buy large quantities of coir yarn which is sorted, bundled and rehanked in their factory. For this work 75 to 100 coolies (men and women) are employed every day. The factory contains three buildings in steel constructure, two of which are used for yarn business and one for rehanking.

Besides yarn they buy large quantities of pepper which is garbled in godowns. Formerly they bought big quantities of copra but for the last two years, on account of scarcity of freight and export restrictions, this business came to a complete standstill. For the pepper, copra and other produce business, such as, turmeric, nux-vomica and ginger, they have two big godowns.

They do not manufacture mats and mattings. They intend putting up a Hydraulic coir yarn press.

Among other coir factories may be mentioned that of *Messrs. Adima & Sons*. It is a big factory and is one of the leading firms in Alleppey. Over 100 looms are working on coir alone. Quite recently this firm has taken up the manufacture of aloe fibre belting on a large scale and is highly successful. The firm employs hundreds of coolies in normal times. Another recent innovation is a cotton weaving factory. About one dozen looms have been introduced and excellent towels, cloths, etc., are woven. The firm is highly enterprising and well managed. It is one of the leading Indian Alleppey mercantile houses.

Messrs. Darragh Smail & Co., Ltd.,—Their factory is principally for the manufacture of coir mats and mattings and on this work approximately 1000 to 1500 coolies are continuously employed. Their period of work is nine hours a day. Steam power is used for running the machinery. The wages of the employees vary from 4 As. to Rs. 1—4 per day according to the nature of the work. This firm also like various other agencies is one of the leading firms of the State.

The Madura Co., Ltd.—Do a large business in shipping here. *Messrs. Spaul & Sons.*, are also exporters of coir mats and matting. *Messrs. Narewalla Naorojee* are an Indian firm of good repute. They have an extensive business in coir mats and matting of which they are the direct exporters. Their factory is in constant work. *Messrs. Mohamed Kunju & Co.*, have a good reputation for coir mats etc. Besides this there are many other firms of greater and lesser importance and almost all are directly engaged in coir manufacture and export.

The General Supplies Agency—has also started a coir factory at Alleppey and are making coir mats and mattings. They also export coir yarn and do general business in lemon grass oil, etc.

Oil Pressing.—Oil pressing is carried on in many mills in Alleppey in addition to the work done in many oil presses contained in the various pakuthies of the taluk. The following oil mills may be mentioned,

1. Messrs. P. John & Sons.,
2. Messrs. P. Joseph Bros.,
3. Messrs. Kuttiammu Muhamad & Co.,
4. Messrs. Abdul Kadhar & Co.,

These firms alone can turn out over 700 tons of oil per month.

Messrs. P. John & Sons., Alleppey.—The firm of P. John & Sons., consists of 6 members of a wealthy Syrian Christian family who have been honourably associated with the commercial life of Alleppey in the State of Travancore for a considerable number of years. The business was established in 1893 by the present partners who are owners of two oil mills in the town, one being situated on the southern bank of the commercial canal, while the other,—a smaller one—has been erected to the same waterway in that portion of Alleppey known as Chungoin.

About 3000 tons of copra, most of which is purchased locally, are dealt with annually in the large mill and the oil is supplied to New York, London, and Hamberg while punnac which is a byproduct is disposed of principally in the last named city. The modern machinery in the factory is driven by an 85 H. P. steam engine for which wood and cocoanut shells are used as fuel. Employment is found for about 100 hands. About 1800 tons of copra are passed through the smaller mill in the course of a year and the produce is disposed of in a similar manner to that which obtains in the other factory. Two kinds of oil are made, the superior quality known as Cochin oil is exported to European countries and nearly all of the inferior sort are sold in Calcutta, Rangoon and Bombay.

The partners are Syrian Christians, natives of Kottayam and they are owners of a fine family ancestral property in that village consisting of 700 acres of cocoanut trees in full bearing. Another of their estates comprises 600 acres of tea bushes at Karunkulam in the district of Peermade and this property is fully equipped with factory, lines for coolies and other necessary buildings.

Cardamoms are grown upon 500 acres of land on high ranges of hills in the Todupuzha district and the produce is sold by auction annually at good prices. The firm also holds shares in the Malayalam Rubber Co.

The other places where copra industry is carried on a large scale are Champakulam and Kozhimukku.

Soap making and candle making can be introduced on a large scale in Alleppey. A small factory for soap making is already opened and soaps find a local sale.

Weaving.—A few isolated weavers are found in many parts of the taluk. Two weaving institutions are in existence in the taluk—one in Alleppey and the other in Thalavadi.

The Weaving Syndicate, Alleppey.—The workshop has seven looms working one of which is for silk and six for cotton. Eight skilled weavers are employed. Rupees 450 worth of yarn is utilised per month. Shirting and coating clothes, towels, bed sheets, etc., are made there and they find a ready sale. Silk coating clothes and saris are also manufactured. 23 small boys are engaged in the factory and are being taught weaving.

The Weaving Institute, Thalavadi.—This establishment has been running for the last nine years. It is equipped with nine improved fly-shuttle looms and accessories and a warping machine with expanding comb of up to date pattern. It turns out cloths of various textures including laced ones and the daily out-turn in different sorts comes up to 120 yards. Owing to the war and the high price of the yarn many of the looms were remaining idle. Three of the looms are working and they turn out coarse cloth.

Many hands have been trained from the institution during the last nine years and many of them have found employment in the establishment and a few have started their own looms. Silk clothes such as saris, handkerchiefs, etc., were also made in the institute. This industry can be encouraged and developed in the taluk. As already mentioned, Messrs. Ebrahim Adima and sons, have started a weaving factory in Alleppey.

Lace and Embroidery.—There is an industrial school in Alleppey where lace making embroidery work and knitting are taught. The strength of the school is 41. There are three

teachers employed. The school is under the management of a lady superintendent who has undergone training in Italy. The school draws a monthly grant of Rs. 30 from the Government.

Screw-pine bags, etc.,—Two miles from Alleppey there is a community of low class-hindus who make fine baskets of screw-pine leaves. Mats of different qualities are also made. These people are good artisans but are extremely poor. Cheroot cases, hand bags, etc., are made by them and sold in the local bazaars. This industry can be organised and developed. The only thing wanted is instruction on proper lines and on proper and up to date models. The manufacture of hats could also be attempted with good chances of success.

Tannery.—A large quantity of hides and skins is brought to Alleppey from various parts of Travancore and also tanning materials are brought from the forest for export purposes. The establishment of a tannery would be a profitable concern. Before the war, exports were made to the other countries from here.

Wood-Distillation.—Destructive distillation of cocoanut shells for charcoal, acetic acid and other products can be attempted here as a large quantity of shells is obtainable.

Lemon Grass Oil.—As a large quantity of crude lemon grass oil is brought to Alleppey for export purposes from Central Travancore. A distillery for refining and purifying the oil can be started with advantage. Attempts are being made now by two firms to do this on a large scale in Alleppey. Before the war a considerable trade was done in this commodity and shipments were made to Europe for the manufacture of artificial scents and for use in soap manufacture. Ionone or artificial scent is one of the best known of these. The industry in Travancore has been steadily declining for some years even before the war cut off the European market entirely. Several causes are attributed but after careful investigation the real reason is obvious. The oil distilled by the Travancore ryots was hopelessly impure and in many cases adulterated. Freight on such goods for export purposes is very costly and since it is quite useless to pay freight charges on water the Travancore oil fell into disfavour and purer forms were taken. In Central Travancore the oil distillation is in the hands of private individuals

and the chief market for sale is at Kayankulam and thence taken to Alleppey for export.

The method of extraction is both unscientific and dirty. There seems to be entire disregard of the fact that to meet present day demands pure clean oil is necessary. The capital outlay entailed is very small and the equipment and method of simple design.

The grass is distilled in a brass still 5 ft. in diameter and 6 ft. in height. The still contains grass mixed with water and is heated over a fire. The volatile oil mixed with steam goes into a worm condenser where it cools down to a liquid and flows out into a receiver. The condenser is a conical wooden tower with worm tubes inside into which cold water is flowing. The mixture of oil and water is decanted in the receiver and oil is drawn off. It is then kept in bottles and sold in the markets.

The oil thus obtained is highly coloured and contains much water, resinous matter and dirt and therefore does not fetch a good price in the market even if a sale is effected. This impure oil can very easily be refined by a cheap process which does not require any large machinery. This final process of refining is to be done in Central Depot established at Alleppey whence the purified oil can be shipped. At present the oil is sold in small quantities at Kayankulam and other local markets and from there it is taken to Cochin. The value of the crude oil is now Rs. 21 per dozen bottles when the cost of production of the same is only Rs. 9 in Central Travancore.

The demand at present is for the purified oil which is sold at a high price in the market. Orders from America have been received by this department for the oil produced in Travancore shipped from Alleppey in as large quantities as possible. Travancore can supply the demand if more care is taken in the extraction of the oil and its purification. Much land exists where this grass will grow in plenty, and the augmented demand of the oil should increase the area cultivated. The lemon grass oil industry is a very old one. Evidence collected shows it to have been a general process done by almost all ryots in some places but now is practically non-existent where once it flourished. The oil must be of good standard quality, free from impurity and water and then it will be bought up readily. The

transport from Central Travancore to Alleppey is easy and cheap by backwater so that no difficulty lies in this direction.

Fishery.—This is an important industry in the taluk and employs some thousands of people. Fish curing has been introduced by the Government very recently at Alleppey. Two fish oil factories are in existence in Alleppey, one run by private agency and the other by Government.

Ship-building.—Several agencies are found here for the building of vallams and motor boats. Messrs. Brunton & Co., have a large establishment for the repair and building of the boats used for traffic whilst motor boats are built locally by Messrs. Dharamsee Vagee & Co. and Messrs. Sankara Iyer & Co. The building of sea-going vessels has just been revived and one boat is on the stocks and will soon be ready. There is ample scope for enterprise in this direction. Messrs. Darragh Smail & Co., Ltd., are also interested in this industry, and a boat has recently been launched.

Foodstuffs used and available locally.—Rice, tapioca, grams, yams, peas, plantains, jack, and vegetables. Fish is an important article of food.

Economic Statistics.

There are many thousands of agricultural labourers in the taluk. The skilled artisans are set out as below:—

Carpenters	Some hundreds	12 As. to Re. 1 a day.
Masons	A few hundreds	8 As. to 12 As. a day
Blacksmiths	About 100	Re. 1 a day on an average and contract work.
Coir workers	Some thousands	4 As. a day.
Fishermen	Some thousands	Rs. 7 a month.
Coolies	Some thousands	4 As. to 8 As. a day.

Cost of living.—

Cultivator's family	Rs. 30 a month on an average.
Single person	Rs. 10 a month „
Cooly's family	Rs. 7 a month.
No. in family.	Cultivator's family. 6 persons.
	Cooly's „ 3 to 4 persons
	No. of Voters 205.

Co-Operation.

	<i>Members.</i>	<i>Capital.</i> Rs.	<i>Profits.</i> Rs.
The Ebenezer Mar Thoma Syrian Christian Co-operative Credit Society	24	3577	79-12
The Pandankari Roman Catholic Chaldean Syrian Christian Co-operative Credit Society	42	1063	8-11 loss.
The Sri Padmanabhavilasom Co-operative Credit Society	50	202	5-2

Joint-Stock Companies.

	<i>Autho- rised. Capital.</i> Rs.	<i>Subs- cribed. Capital.</i> Rs.	<i>Paid up. Capital.</i> Rs.
The Ambalapuzha Christian Bank, Ltd.,	19,000	7,000	4,821
The Malabar Trading and Industrial Co., Ltd.,	300,000	4,160	1,015
The Mar Thoma Rubber Co., Ltd., (For rubber and other plantations)	300,000	42,750	42,750
The Kuttanad Rubber Co., Ltd.,	200,000	100,000	100,000
The Chempakanad Rubber Co., Ltd.,	150,000	25,000	5,000
The Oriental Rubber Co., Ltd.,	200,000	37,750	7,550
The Central Travancore Industrial and Trading Co., Ltd.,	100,000	50,100	46,839

Capital and Remarks.

The total co-operative capital is Rs. 4,842 and the total subscribed joint-stock capital is Rs. 7,60,585 of which Rs. 7,55,103 have been fully subscribed. It is impossible to estimate the capital available. Large European and Indian firms are found everywhere who are willing to take up any profitable business. Alleppey is the commercial and business centre of the State. A commercial college and coir research institute would probably be of immense local value. In normal times there is plenty of work and plenty of money always available for new development.

CHIRAYINKIL TALUK.

Area,—146.57 Sq. miles. Population, 1,35,880.
 No. of houses, -20,095. No. of Pakuthies, 31.
 Taluk town.—Attingal.

Location.

Division.—This taluk forms the northern portion of Trivandrum Division.

Boundaries.—NORTH.—Quilon and Kottarakara taluks

SOUTH.—The Arabian Sea and Trivandrum.

EAST.—Nedumangad and Kottarakara taluks.

WEST.—The Arabian Sea.

Railway.—The Trivandrum—Quilon Railway runs through the western portion of the taluk [near the coast, Warkalay, Kadakavoor, and Chirayinkil are the three Railway stations situated in the taluk.

Backwaters and rivers.—The Nadayara Kayal extends into the Airur Pakuthy in the north. The Edava Kayal forms the northern portion of Edava Pakuthy. The Koli-thottum Kayal is situated in Vettur and Cherunniyur Pakuthies. The Anjengo Kayal is found in Anjengo a British territory. The Kadinamkulam Kayal extends up to Alur in the north and to Kadinamkulam and Pallipuram Pakuthies in the south. These waterways are connected together by the Quilon-Trivandrum Canal and affords good means of communication from Quilon to Trivandrum. The Vamanapuram river flows through Ilempa, Alamkode, Attingal and Chirayinkil Pakuthies, and falls into the lake near Chirayinkil. It is navigable for Vallams up to Attingal bridge.

Main roads and village roads.—The main central road passes through the middle of the taluk, namely, Attingal, Alamcode, Karivaram and Navaikulam. From Attingal, one road runs southwest to Chirayinkil. From Alamcode, one road goes northeast to Kilimanur and another goes southwest to Anjengo. A branch of the latter road goes to Warkalay and Edava. Many other village roads exist. Most of these roads are in good condition for cart traffic and are greatly used for transport purposes.

Nearest seaport.—Quilon is the nearest seaport and is 22 miles distant from Attingal.

Cultivation.

Wet land area, 12,473 acres. Dry land area. 53,846 acres.
Cocoanut land area, 53,846 acres. Unregistered land area, 18,534 acres.

Pakuthies.

Name of pakuthy.	Area	Wet land.	Dry land.	Cocoanut land.
	Sq. miles.	Acres.	Acres.	Acres.
Attingal	1.98	212	862	862
Kizhattingal	2.97	286	1092	1092
Alamcode	4.14	500	1757	1757
Avanavancherry	2.91	248	1188	1188
Edacode	8.88	868	764	764
Elampa	2.04	192	517	517
Mudakal	4.51	843	961	961
Kadakkayoor	4.04	232	1896	1896
Kilimanur	7.35	744	1516	1516
Palayakunninmal	9.65	573	1231	1231
Kunthalloor	1.47	320	464	464
Kizhivillam	4.67	588	2095	2095
Madavoor	7.24	547	2562	2562
Pallikkal	6.25	882	1957	1957
Vellalloor	4.39	429	1844	1844
Cherinniyur	4.20	277	1824	1824
Manampoor	5.04	660	2407	2407
Ottur	8.66	878	1787	1787
Koduvashannur	4.64	270	1377	1377
Nagarur	8.14	483	1941	1941
Pulimathu	7.32	864	2086	2086
Karavaram	5.16	519	2423	2423

Name of Pakuthy.	Area.	Wet land.	Dry land.	Cocoanut land.
	Sq. miles.	Acres.	Acres.	Acres.
Navaikulam.	10.93	1049	4574	4574
Azhur.	4.81	402	1729	1729
Charkara.	2.45	335	841	841
Chirayinkil.	1.74	336	627	627
Airur	6.77	588	1302	1302
Chemmaruthi.	6.87	488	3344	3344
Vettur.	2.62	88	1324	1324
Warkalay.	5.93	218	2448	2448
Edava.	3.52	127	1467	1467

Education.

GOVERNMENT VERNACULAR SCHOOLS.

No. of H. G. Schools,	10.	3497 boys.	212 girls.
No. of L. G. Schools,	19.	3197 „	525 „

AIDED SCHOOLS.

No. of L. G. Schools,	30.	2543 boys.	766 girls.

UNAIDED SCHOOLS.

No. of L. G. Schools,	3.	No. of pupils,	117.

GOVERNMENT VERNACULAR SCHOOLS FOR GIRLS.

No. of H. G. Schools,	4.	1195 girls.
No. of L. G. Schools,	4.	459 „

AIDED SCHOOLS.

No. of H. G. Schools,	1.	218 girls.
No. of L. G. Schools,	1.	84 „

GOVERNMENT ENGLISH SCHOOLS.

No. of H. G. Schools,	1.	492 boys.	31 girls.

UNRECOGNISED SCHOOLS.

No. of L. G. Schools,	2.	74 boys.	15 girls.

INDUSTRIAL SCHOOLS.

Kadakavoor Saraswathy Vilasom Weaving School,	16 pupils.	2 Teachers.	Weaving & sewing.

Attingal Weaving School,		Weaving & General instruction.
18	2	
Kizhattingal Shunmuga Vilasom School,	16	Weaving.
2		
Bhagavathivilasom Weaving School,	12	Weaving.
1		

Natural products and their present utilisation.

Paddy.—Paddy is cultivated in all parts of the taluk. There are 12,473 acres of paddy land of which about 87% are double cropped and the remainder single cropped. The largest area under paddy is found in Navaikulam pakuthy where 1,048 acres are under cultivation. The quantity of paddy produced in the taluk is not sufficient to meet local demands and it is imported from Alleppey. The paddy is husked locally by people in their houses. No husking mill is working in the taluk. Rice is also imported from Alleppey.

Cocoanuts.—This taluk is a large cocoanut producing area. There are 53,846 acres of land under cocoanut plantation. They are found in all the pakuthies. The number of cocoanut trees in the taluk can be roughly estimated at about 4 lakhs. The products are utilised in making copra and coir, large quantities of which are exported to Alleppey and Cochin. In some parts of the taluk such as Charkara, Kizhattingal, etc., the cocoanut industries are carried on largely. Copra is pressed for oil in the local bullock-driven presses.

Tapioca.—Tapioca is cultivated in most parts of the taluk. A major portion of the yams is consumed locally by the poor people. The cultivation of tapioca can be greatly increased in the taluk. Large portions of the existing waste land can be utilised for the purpose. Much of this land is ideal for the purpose and is hilly. Hundreds of acres could be obtained. Dried roots of tapioca are exported to Quilon and other places. A small factory for making tapioca flour can be started near Attingal.

Arrowroot.—It is grown mostly in Manampoor, Vellalur, Nagaroor, Attingal, Alamcode, Ilamba, Mudakkal and Madavur pakuthies. Very little use is made of this material at the present time.

Pepper.—Pepper is largely cultivated in Madavoor, Ilamba, Idakode, Avananchery pakuthies. The product is

gathered by local merchants and sold in Alleppey and Cochin. Very little of it is consumed locally.

Arecanut.—Arecanut is grown largely in Charkara, Chirayinkil, Navaikulam and Idava pakuthies. A large quantity is consumed locally. A portion of the quantity is dried and exported to Alleppey.

Other products.—Yams of different kinds, peas, gingelly, chama, grains, etc., are grown for local purposes and consumed locally.

Fruits.—Pine apple, plantain, mango, jack are grown fairly largely and are utilised locally.

Oil-bearing trees.—Pinnay and Marottie, are the most important found here.

Other trees.—Tamarind, pala, cashew-nut, pine, venga, black-wood, teak, etc. Bamboo and canes are also found.

Minerals.

Kaolin.—Kaolin is found near Warkalay and Attingal. The quality is fairly pure.

Marcasite.—Marcasite is found near Warkalay and Kili-mukku. It exists in tubular forms and is found mixed with iron sulphate and alum.

Graphite.—Traces of it are found near Attingal.

Lignite.—Lignite is found in the so-called "Warkalay beds". It exists in large quantity but is mixed with marcasite and clay. It can be worked with a large capital.

Monazite and Ilmenite.—Monazite and Ilmenite are found in small quantities in Warkalay from Anjengo to Edava and also near Vettoor hills.

Iron Pyrites.—This is found at a depth of 40 to 50 ft. under the backwater mud. Whilst boring for railway bridge foundations this was unearthed. Red and yellow ochre are largely derived from the local clays and are used for paper manufacture.

Existing and Possible Industries.

Agriculture.—This is the most important industry in the taluk. Paddy cultivation, cocoanut plantation, tapioca and plantain cultivation occupy the time of the major portion of the population. There are 12,473 acres of paddy land and over fifty thousand acres of cocoanut land and other

cultivable land. There are above 7,000 farmers, who own lands and under whom many thousands of people are working. The methods employed in agriculture are being improved on scientific lines. The agricultural implements are both made locally and also are imported from Quilon. Repairs are done by local smiths and carpenters. The agricultural landlords can be numbered at about one hundred. A labourer in the fields earns from 6 chs. to 9 chs. according to ability. There are many unskilled labourers.

Cocconut industries.—There are about 4 lakhs of cocconut palms in the taluk. The cocconuts are used for local needs, for making copra and oil. The husks are utilised for fibre extraction in some of the pakuthies but in others they are used for fuel.

Copra making.—Copra making is carried on largely in Chirayinkil, Charkara, Kadakavoor and Alur pakuthies. A portion of the copra is pressed in bullock driven oil presses, and the oil is mostly used for local consumption but a small quantity of it is exported to Quilon and Trivandrum. The remaining copra is generally exported to Alleppey and Cochin. Small export was also done to the oil mill at Trivandrum but with the stoppage of its working during the war this trade stopped. Copra merchants buy copra from small dealers and also make copra themselves on a large scale for export purposes. The average income of a copra dealer ranges from Rs. 30 to Rs. 100 a month.

Coir industry.—Coir industry is very largely carried on in Chirayinkil, Kadakavoor, Alur, Vakkom, Manampur and Kaikara pakuthies. In these pakuthies the soaking facilities are excellent, as the backwaters and canals run very near the cocconut plantations. This industry is mainly in the hands of the Ezhava community and more than 5,000 coolies are engaged. On the average a cooly earns 4 Chs. a day. Large quantities of coir yarn are exported to Alleppey and Cochin by backwater.

Weaving.—More than 400 weavers are working in Kadakavoor, Vakkom and Kaikara pakuthies. Superior cloth such as lace Nariethu is made in these places and also cloth for ordinary wear, such as Thorthus. There are four weaving schools in the taluk and 62 pupils are receiving instruction in them. The Attingal weaving school has a long standing as it was started in 1079 M. E. Many of the pupils who have left this school are carrying on this industry in their own

homes. An average weaver earns Rs. 10 to Rs. 15 a month under normal conditions. The yarn is bought from merchants in Alleppey and Trivandrum. Bedsheets, towels, shirting and coating cloth are manufactured in the Attingal weaving institute.

Iron work.—The hereditary blacksmiths at Warkalay are famous for their skill in iron work. There are a large number of skilled artisans in constant work. Mention should be made in particular of the work of the K. G. R. Factory. All kinds of knives, cutlery, etc., have been made and large orders supplied. The factory was established in 1917 by the Industries Department and shortly afterwards was taken up by a company. Scissors, knives, and cutlery of all kinds have been made. Tapping knives, pruning knives etc., were made to order. The factory now turns out goods valuing up to Rs. 400 a month. About 20 workmen are engaged and they earn up to Rs. 15 per mensem. The public could greatly assist the institution by orders and purchases.

Oil pressing.—More than 3,000 oil mongers are found in the taluk and about 500 bullock-driven oil presses are working. These find continuous work. Copra and laurel seeds are largely pressed. The laurel oil and seeds are exported to Kottar, Trivandrum and other places.

Fishery.—Fishing is carried on very largely in Vettur, Idava, Kadakavoor and Warkalay pakuthies. Most of the fishing is in the hands of the Mohamedans of whom some thousands are engaged in this industry. Fish-curing is also carried on largely in these places. The cured fish is exported to Colombo, Singapore and other places in large quantities every year. Thousands of people earn their living in this calling and similar economic conditions pertain here as elsewhere.

Rattan work.—There are about 300 families of rattan workers in Warkalay, Vilapuram, Attingal, and Navaikulam pakuthies. In each family there are four skilled workmen on an average. It is said that this industry owes its origin to Missionary effort but certainly it has now become a caste calling. The rattan workers cut and buy their rattan from the neighbouring forests themselves. They obtain a license from the Forest Department to cut the rattan. The work is largely done in execution of orders but some of them wander

about in search of work in Trivandrum, Quilon and other places. All kinds of rattan work are undertaken, furniture, chairs, baskets, etc., are made in quantity and sold locally. Certain members of the community travel about and undertake rattanning the seats of chairs, sofas and general repairs. The people as a whole do not get regular work and have no idea of either the place or demand of the best markets. The average earning of a well skilled workman is about Rs. 15 a month, and he could earn up to Rs. 30 if in constant work. Rs. 7 to Rs. 10 is the average earning really as few of the workers are actually engaged for more than a few days per month. The great trouble is to get the men to be diligent. It is only when faced with starvation that they really work to time. They have no idea of time, proper charges or proper markets. The goods made are hawked about the streets of the towns and sold to the highest bidder. Hunger often forces a sale to be made at less than cost price. Large and regular orders were obtained by us for these people. Three and four months were taken to execute them when three weeks were ample. Further they will not stick to an estimated price. The lack of centralised control makes the work impossible to develop. Firstly a co-operative depot is essential for the distribution of raw materials and the collection of finished articles. The people are poor and have to make advances before they can begin work. The depot should be able to make advances for work done or pay regular wages. The depot should teach new patterns, obtain orders, and supply the goods in quantity on a commercial basis. Firstly it should be Government controlled, but later it should be handed over to the people themselves when they reached a sufficient stage in their education and capacity. The market is ready and the demand assured. Organisation is all that is necessary.

The Attingal Industrial Works was started for the manufacture of penholders, inkstands, sealing wax, varnish, tapioca flour, etc. These are made only on a small scale by primitive methods. A printing press is also attached. The proprietor has considerable ingenuity, but if carefully trained in one direction only would be more likely to attain the success his energy merits.

Pottery work.—Large quantities of good clay can be seen in the taluk and pottery work is flourishing in many places. It is chiefly carried on in Airur and Attingal and the demand

for the articles is mainly local. In these two places alone there are about 200 families of potters. Rs. 7 is about the average income although well-skilled workers earn much more.

Granite work.—Granite is obtained in Naikad and Airur pakuthies and many persons are engaged in stone work. Mortars, pestles, grinding stones, curry-stones, granite oil-presses are made by these workers. The articles find not only a local sale but are sent to the neighbouring taluks also. There is a steady demand for the goods and the industry could be developed. At present it is entirely worked by individual artisans.

Basket and Mat making.—It is carried on chiefly in Attingal and Airur pakuthies. The raw materials are cut down from Nedumangad forests and carried from there either by carts or by head loads by the people themselves. There is no depot where the raw materials are stored. Baskets and mats are sold on market days in the different parts of the taluk and satisfy local demands only.

Foodstuffs available and used locally.—Rice, cocoanut, tapioca, peas, yams, and plantains, jack, mango and vegetables, Fish is largely consumed

Economic Statistics.

The majority of the population are agriculturalists. The skilled artisans in other crafts are given below:—

Carpenters.	about 700.	Earn 12 Chs. to 17 Chs. a day.
Blacksmiths.	500.	„ 12 As. a day.
Masons.	200.	„ 16 Chs. a day.
Weavers.	about 400.	„ 14 Chs. a day.
Fishermen.	4000.	„ Rs. 7 a month.
Potters.	200 families.	„ Rs. 7 a month.
Coolies.	Some thousands.	„ 6 to 10 Chs. a day.

<i>Cost of living.</i> —Cultivator's family,	Rs. 30 a month.
Single person,	Rs. 10 a month.
Cooly's family,	Rs. 7 a month.

<i>No. in Family.</i> —Cultivator's family,	6 persons.
Cooly's family,	3 to 4 persons.
No. of Voters,	106.

Co-operation.

There are no co-operative societies in the taluk.

Joint-stock Companies.

	Authorised Capital Rs.	Subscribed Capital Rs.	Paid up Capital Rs.
The Lakshmi prasada Vyavasaya Abhivardhini Co., Ltd., Attingal (To conduct a weaving institute)	5000	5000	4692
Travancore Warkala Janardana Prabha Boat Co., Ltd., (To conduct boat service in backwaters and canals.)	1050	1050	300

Capital and Remarks.

There is no co-operative capital. The total joint-stock capital subscribed is Rs. 6050 of which a sum of Rs. 4922 has been paid up. The taluk is well situated on the backwaters and road, rail and water communications are good. The above report contains suggestions for industrial development but the striking points for the future are—rattan work as a cottage industry, brush making, coir mat making, also as cottage occupations. Iron work could be more fully developed. A tapioca flour factory would certainly prosper if the production was increased. Weaving needs attention and a central cottage industry depot would help greatly. Capital can be found for small industries but large investors are few and probably absent. Intensive cultivation should be done and if some means of easy credit for banking and release of working capital is devised it would greatly assist the development of the country side.

QUILON TALUK.

Area. 147.42 sq. miles. Population. 1,63,750
No. of houses, 31,368 No. of patakhsies 13. Taluk town. Quilon
Location.

Division. This taluk forms the southern portion of the Quilon Division.

Boundaries. NORTH. Karunagapalli and Kunnathur Taluks. The Kallada river divides Quilon taluk from Kunnathur taluk.

SOUTH. Chiryinkil taluk.

EAST. Kottarakara taluk.

WEST. The Arabian sea.

Railway.—The Trivandrum Shencottah railway runs through the taluk. There are four railway stations in it. Quilon is an important railway centre. The railway runs through Perunad, Kottarakara, Vadakevila, Iravipuram, Mayanad, and Paravoor pakuthies. The means of communication and transport facilities for these pakuthies are good. The railway connects direct with the backwaters by a siding along the embankment at the edge of the water.

Backwaters and Rivers.—The Ashtamudi lake lies in the northern portion of the taluk reaching up to eastern Kallada to Perunad to Tirukadavu and other pakuthies. The Paravoor lake is situated in the centre of the three pakuthies of Mayanad Paravur and Iravipuram and is an important waterway connecting these three pakuthies. Idava lake is in the south of the taluk and is situated in the Paravur pakuthy. All these lakes are connected by the Trivandrum Quilon canal which is the main water-way between the two towns.

The Kallada river forms the northern boundary of the taluk for some distance. It is navigable for small boats. The Ithikara river with its tributaries falls into the Paravur lake.

Nearest Seaport.—Quilon is an important seaport. Regular steam and motor boat services are running between Quilon and Alleppey both by day and by night along the backwaters. For many years the port improvement has been a matter of discussion. If something could be done it would greatly facilitate the development of Travancore industries by providing a central outlet for export. Tea and rubber are sent in large quantities to Cochin and Tuticorin for export when Quilon is much nearer and easier of access.

Main Roads & Village Roads.—The Trivandrum Quilon road passes through Mayanad and Iravipuram pakuthies of this taluk. A branch of this road goes to Paravur from Chathannur. Another branch runs to Yelamballur near Kundara station. The main roads are well kept but many village roads need attention.

Cultivation.

Wet land area. 12,441 acres. Dry land area, 51,084 acres.

Unregistered land area. 5413 acres.

Uncultivated land area. 10,135 acres.

Cocconut land. 28,224 acres.

Pakuthies.

Name of Pakuthy.	Area- sq. miles.	Population. Persons.	Wet land Acres.	Dry land Acres.	Cocconut land Acres.
Adichanallur.	6.53	12950	1298	2194	1000
Nedumpana.	10.90	5900	803	3315	1500
Iravipuram.	11.23	18870	887	2603	4500
Tirukonavattam.	8.63	7180	730	2825	800
Vadakkevila.	3.81	6400	716	1423	1200
Eastern Kallada	9.59	9320	1322	2672	2100
Kilikollur.	4.33	9640	546	1897	1100
Kottangara.	9.80	8000	818	4536	1550
Minad.	27.12	12948	2436	11098	3300
Paravur.	12.72	15650	656	5203	4000
Trikadavur.	12.83	14690	446	3013	2170
Pornnadu.	20.71	17150	929	7053	1930
Qullon.	9.21	33130	853	3252	3032

Education.**GOVERNMENT VERNACULAR SCHOOLS.**

No. of H. G. Schools 11 4538 boys 789 girls.
 No. of L. G. Schools 18 2872 boys 736 girls.

AIDED.

No. of H. G. Schools 2 311 boys 48 girls.
 No. of L. G. Schools 51 3689 boys 1070 girls.

UNRECOGNISED.

No. of Schools 14 Strength 604 pupils

GOVERNMENT VERNACULAR SCHOOLS FOR GIRLS.

No. of H. G. Schools 2 709 girls.
 No. of L. G. Schools 6 1006 girls.

AIDED SCHOOLS.

No. of H. G. School 1 386 girls.
 No. of L. G. Schools 6 698 girls.

GOVERNMENT ENGLISH SCHOOLS.

No. of H. G. School 1 495 boys 4 girls.

AIDED.

No. of H. G. School 1 481 boys.

No. of L. G. Schools 2 203 boys 21 girls.

UNRECOGNISED SCHOOLS.

No. of Schools 2 92 boys 15 girls.

ENGLISH SCHOOLS FOR GIRLS. (AIDED)

No. of H. G. School 1 151 girls.

INDUSTRIAL SCHOOLS.

	No. of boys.	No. of Teachers.	Subjects.
Government Carpentry school, Quilon.	49	7	Wood work, drawing manual training and general subjects.
Mangad Weaving school. (Aided)	66	2	Wearing.
Paravur Sri Krishna- vilasom Industrial school.	44	7	Coir work, Blacksmithery, and Tailoring.
St. Joseph's Technical school, Quilon.	61	6	Lace making, embroidery fancy work, etc.

Natural Products and their present Utilisation

Paddy—Paddy is grown in all the pakuthies of the taluk and its cultivation extends over an area of 12,441 acres, a third of which is double cropped while the remaining portion is single cropped. The 3 pakuthies namely Eastern Kallada, Adichanallur and Mayyanad contain the largest portion of paddy growing area. The paddy grown in the taluk is not sufficient for local consumption and consequently a large quantity of it is imported from Burmah. There are no rice hullers in the taluk and all the paddy is husked by the local people in their own husking mills.

Cocoanut.—This is an important product of cultivation. All round the backwaters the cocoanut palm is grown in large numbers. The total area under it is 28,224 acres and the trees number over 6 lakhs. The cocoanut is cut and

copra and oil are prepared from it. The husks are soaked in the backwaters and converted into fibre and coir. A large quantity of coir, copra, and oil is exported to other countries.

Tapioca.—Tapioca is cultivated in all the pakuthies of the taluk on a fairly large scale. This can be increased considerably as there are many acres of land lying fallow, which could be utilised for tapioca growing. The present output is consumed in the locality and some is imported from Pattanapuram and other taluks. Some of the yams are dried and exported. No attempt has been made to convert them into flour. This could be done with advantage although possibly Punalur District is better suited for the location of a factory.

Other products.—Yams of different kinds, plantains, and bananas, peas and grams are grown in a small scale and consumed locally. The cultivation of these products can be increased and a large supply obtained for export.

Oil bearing trees.—Pinnay, Marotti and Pine trees are found fairly largely. Oil is obtained from the seeds and is used locally.

Other trees.—Jack, mango, arecanut, tamarind, and cashewnut. These are grown mostly for their fruits. But in the case of some the wood is also utilised.

Minerals.

Kaolin.—There is a large deposit of kaolin found near, Kallada, Kumblam, Itthikara, Kanjirode and Padappukara and all round the Ashtamudi lake. The deposit is good and large quantity is available. Attempts are being made to work it up.

Kumblam is situated on the eastern shore of the Ashtamudi lake about 22 miles from Quilon. It is a small village containing about 1000 scattered houses, and a population of 2700. A few Pulaya houses can be seen here and there.

The people in the locality are not as yet well educated; but two Vernacular schools were opened a few years ago under the management of a Roman Catholic Church. The school for boys contains four classes and has a strength of 200 while the girls' school has 100. Both of them are aided ones.

The people have little work for the major portion of the year. The occupation of the people is mainly agriculture but a few are fishermen. The cultivation of paddy and tapioca forms the chief occupation of the people. There is no industry established for them. It is a hilly tract and there is scarcity of water in many places, the wells being about 50 ft in depth.

From about 10 to 20 feet the soil is of the red variety, namely laterite. The white clay makes its appearance below this depth and is found mixed up with laterite soil for a further depth of 5 to 10 ft. Below this level it is all pure white up to 50 feet. A farthest depth to which this deposit extends is not yet known. It has also been noticed that in the first layer of the laterite soil, big lumps of the white material exist in many places and are very pure.

The people finding the white clay quite useless are throwing it away into the lake in large quantity annually, thus exhausting the resources of the district. Some of the white clay is dug out and sold in the Quilon market at 1 Ch. per pound. It is generally purchased by the poor people and used for white-washing purposes. It is also used to some extent as a substitute for white chalk. About 400 lbs. of this stuff are sold monthly in this way. Experiments are now being tried for utilising this material for making finer kind of pottery and the mineral is a source of wealth to the country if it is properly worked.

The extent of the clay is estimated to be 10 miles in length and 3 miles in breadth. The same mineral can also be traced at Koivillie, Padappukara and other places around the Ashtamudi lake. Good means of communication exist, as vallams can go direct to the place of quarrying. Quilon is probably the best place for starting the factory as communication is very easy and fuel can be more easily obtained there.

The people are poor, their staple food being rice, tapioca and yams. The cost of living for an individual comes to about 3 As. per day.

The nearest Railway Station is Kundara about 4 miles by road from Kumbalom but the roads are poor. The cart road is not a good one and is nearly a village road unfit for hard wear. It is suited for making "Blanco". The

result of the analysis is as follows, as a sizing material for paper and for fire bricks.

Clay matter (PURE)	87.2%
Quartz	2.8%
Felspar	0.0%
Water	10.0%

A further use for the Kaolin is in the preparation of size, for cloth, etc., and the Travancore variety is eminently suited to this. Already arrangements and negotiation are on foot to start the Industry and it is probable that this will be done within the next few months. The suggestion that "Blanco" might be made as a minor Industry was put forward. The process is simple, the dry clay was taken in an actual experiment performed by this department and finally crushed to a smooth powder. It was next mixed into a paste, made of the powder a liquid obtained by boiling a bruised piece of "Prickly pear Cactus" so as to extract the sticky substance contained therein. This gives the necessary adhesiveness to the clay. It was then passed into a wet tin mould of circular design and so made as to cause a circular depression in the centre. The material was next slowly dried and it gave excellent results. For whitening shoes, &c., it was most efficient and orders have been received for goods of like quality. The price at which we could sell is about $\frac{1}{4}$ of the cost of the preparations at present on the market. It is recognised that this is a very minor and small industry but it needs no skilled labour and would be of material benefit to the people of the community where the deposit exists. Specimens of pottery, cups, and saucers have been made from the clay in the School of Arts, Trivandrum and experiments are now proceeding to find the correct percentage of felspar to be added to obtain good porcelain. Already samples containing from 15 to 33% have been made with success. Enquiries regarding this industry have already been made and with the abundance of skilled potters in Travancore the question of securing workmen is readily answered. It is hoped that this industry will find people readily to work it to success. Fire-bricks could possibly be made from it better than pottery and porcelain, as it is too pure for the latter purpose to be a really good pottery clay without admixture of other materials.

Monazite, Ilmenite and Garnet.—A mixture of the three minerals is found in small quantity near the mouth of the Kallada River. This is not worked.

Existing and Possible Industries.

Agriculture.—Agriculture is an important industry in the taluk. Paddy cultivation, cocoanut plantation and tapioca growing are the main crops produced. The area under paddy is 12,441 acres while that under cocoanut is 28,224 acres. The number of persons engaged in agriculture is about 40,000. The land-lords in the taluk can be estimated at about 130. The average earning of a land-lord is Rs. 3000/- a year and an agricultural workman earns about 10 Chs. per diem. Agricultural implements are bought from Quilon by the cultivators and the repairs to them are made by local blacksmiths and carpenters. There are over 1400 carpenters.

COCOANUT INDUSTRY.—Copra making.—The important pakuthies where copra making is carried on are Paravur, Quilon, Mayanad, Perianad, Killikulam, Iravipuram and Eastern Kallada. The major portion of the copra is brought to Quilon and Alleppey. There is an oil and coir mill at Quilon. It is well equipped and is situated on the shores of the lake. The building and site are good and satisfactory work was carried on before the war. The work was stopped owing to the want of shipping facilities for the products.

Oil pressing.—Oil pressing is carried on as a cottage industry in Vadakevila, Paravur and Quilon pakuthies. This supplies only a portion of the local needs of the taluk. There are some hundreds of people here engaged in this.

Coir industry.—This is carried on in a large scale in the factory in Quilon but this has stopped work owing to shipping difficulties as a result of the war. As a cottage industry this is thriving and some thousands are engaged in it. Soaking facilities are good in most parts of the taluk, especially Quilon, Paravur and Perinad pakuthies. There is a fibre weaving institution at Paravur known as the "Paravur Weaving Institute" where many articles are made of coir and aloe fibre. Coir matting, coir bags, coir mats, etc., are also made on a commercial scale in the institute. Government gives aid to this institution. There is a wide scope for improving this industry in the taluk. The looms of the institute are working fully and the proprietor has a good reputation for this work.

Tile and Brick works.—There are three important tile works in the taluk. Messrs. Harrison and Crossfields, Ltd., and Messrs. Thomas Stephen and Co., have big concerns.

Messrs. Harrison and Crossfields, Ltd.,—They have two factories under the same management and situated near each other. Various kinds of tiles, flooring, pipe bricks, soorki and chunam are manufactured here. One of them is worked by a steam engine 40 H. P. The raw material clay etc., are brought from Ittikara, Kallada and Karunagapally by canal route. Fire wood is brought by rail, canal boats, and carts. The quantity used up in the factory is 1200 Cubic yards of clay and 400 tons of firewood per month. The out-put of the factory is 400,000 pieces per month. There are 12 skilled artisans and 360 coolies working in the factory. The wages of a skilled artisan are from 21 Chs. to Re. 1-4 per diem. The wages of an average cooly vary. Youths get from 6 to 10 Chs. a day and men from 8 to 18 Chs. per day according to ability. The employees work for 11 hours a day.

Factory II.—This is a larger factory and is situated near the first. The articles manufactured are various kinds of tiles, floorings, and pipes, bricks, soorki and chunam. In this factory two steam and one gas engine are used. The steam engines have 70 and 60 H. P. capacity and the gas engine has 150 H. P. capacity. Clay is brought down by canal boats from Ittikara, Karunagapally and Kallada. Coal, cocoanut shells, and fire-wood are brought by rail, canal boats and carts. The quantity of raw materials used per month is 2700 Cubic yards of clay, 205 tons of fire-wood, 102 Tons of cocoanut shells and 60 tons of coal. The out-put of the factory is 750,000 pieces per month. There are 42 skilled artisans and 800 coolies employed in the factory. The wages of an average skilled artisan are from 21 Chs. to Re. 1-4 per day and those of a cooly are from 6 to 7 Chs. for youths and from 8 to 18 Chs. for men. The employees work for 11 hours a day.

Saw Mills.—Messrs. Harrison and Crossfields have a saw-mill department where sawing, box making, carpentry, etc., are carried on in a large scale. This is worked by two gas engines of 80 and 60 H. P. and also by electric power. The timber is bought from the Travancore Government Forests and also from private sources. It is brought from forest coupes by rail and from depots by water. The out-put of the factory is from 75 to 100 candies per month and the quantity of wood used is approximately 2100 candies. There are 21 skilled artisans and 350 coolies engaged in the factory. The wages of an average skilled artisan are from

Re. 1 to Rs. 2 per day. Cooly wages are from 5 to 7 Chs. per day for boys and from 10 to 14 Chs. for men. There are 11 hours of work in the factory.

Engineering Workshops.—Messrs. Harrison and Crossfields Ltd., have an engineering workshop in Quilon where all engineering repairs, structural steel work as bridges, factories, etc., building of motor boats, tugs and barges etc., are undertaken. The raw materials used are steel, pig-iron and coke. Steel is brought from England, pig-iron and coke are brought from North India. The various machines in the factory are run by Ruston Crude Oil Engine of 32 H. P. of which 30 H. P. are utilised in the factory. This contains the following departments.—

Foundry.—The capacity of the foundry is one ton of cast iron per week and the brass foundry melts and moulds 6 cwt. The size of the largest casting that could be done is $3\frac{1}{2}$ cwt. There are 4 skilled moulders, 11 coolies and two carpenters engaged in this department.

Machine Shop.—The following machines are erected—one lathe up to 8 feet, 4 lathes about 8 feet. one $14\frac{3}{4}$ ft. slotter. Three drilling machines, screwing machine, tapping machine, and machine hack-saw. 5 turners, 3 turner-apprentices, 7 lathe assistants, and 6 coolies are employed in the department. Tea and rubber machinery, wood-working and tile machinery and general repairs are done here.

Erecting and fitting shop contains one small miller, usual benches, punching machines, etc. There are 16 fitters, 5 apprentices and 5 coolies employed in it.

Smith's Shop.—The smith's shop contains 6 double hearths and one 3 cwt. pneumatic hammer. The workmen in this department are nine blacksmiths, 3 hammer-men and 4 smith's boys and 2 coolies. Tin smiths' and sheet metal shop contains one set 6' bending rollers. Three tins-men and one cooly are employed in it.

Miscellaneous Department.—This contains one heavy shearing and punching machine, one 6'—0" Radial Driller and one circular cold sawing machine. There are 4 skilled artisans and 4 coolies in the department.

In the pattern making department 5 pattern makers and one packing carpenter are employed.

The wages of an average skilled artisan are Re. 1-4 and the wages of a cooly are 7 As. The number of hours of work per diem is 10 hours.

Thomas Stephen & Co., Ltd.,—This enterprising Indian Firm has established a good business connection and has a good and well equipped factory. The tile works is an up-to-date business run by power engines. Large quantities of tiles are exported annually. The clay is obtained as in the case of Messrs. Harrison & Crossfields., by vallah importation. The company have also a large saw-mills and recently have begun ship-building. The works are a good example of Indian enterprise.

This Company was originally started by Mr. Thomas Stephen in conjunction with his two partners *viz*, Messrs. Atchuthan and Cochera as a partnership concern in November 1909. The ambition of the originators then was to manufacture about a lac of tiles per month as funds at their command would not permit for a higher scheme. In May 1911 the first lot of tiles were turned out for the market and in that year 3,34,000 tiles were manufactured with "Double Elephant" trade mark almost resembling the Coat of Arms of Travancore with the exception of the shank. In 1912 the out-put came to 8,81,000 and in 1913 to 14,27,000 tiles in the meantime some more partners were taken in order to raise more funds required for the extension of the business. In 1914 the output was raised to 15,21,000 but it was found that the progress of the business was not in proportion to the steadily increasing demand for their tiles and so it was necessary to further increase the product to at least three lacs per month and at the suggestion of Mr. K. Parame-waren Pillay B. A. & B. L. High Court Vakil then practising in Quilon, who was also a partner of the business, the business was incorporated as a Joint Stock Company with limited liability in February 1915. Thereby more share holders were taken in and the necessary funds were provided, the result being that the output which was 18 lacs in 1915 was steadily increased to 48 lacs in 1918 and is still being increased.

Quilon Spinning Mill.—This large mill was originally started for the spinning of cotton. The management was European and the company prospered. The mill was transferred to a local company and soon became a subject for litigation. It was closed down and has worked for some years. The power of the mill was derived from a 200 H. P. steam engine with a 50 ton fly-wheel. The engine is still in good repair and valuable machinery, lathe tools, spinning machines are all idle and sinking into disrepair. The building is a substantial one and is on the edge of the backwater

close to the railway landing place. It is an ideal site for a factory, probably cotton will not pay here again as the mill is far from the cotton growing areas, however, railway facilities are good.

The Spinning Mill was established in 1884 and worked for over 20 years without interruption. It was equipped with 25,560 Spindles and turned out $7\frac{1}{2}$ lakhs of rupees worth of twist annually. The raw cotton was mostly obtained from Bombay and brought by sea. Tinnevely cotton was only used a little. The Mill is now idle, but the machinery is still complete.

Blacksmithery.—At Paravur and in other places very skilled blacksmiths are found. In the former place a blacksmith named Krishnan makes razors and cutlery of good quality and also produces printing types and metal seals and stamps. As a minor industry this is at present flourishing and the skill of the workers is to be commended.

Carpentry.—The Government carpentry school is situated in Quilon. The staff consists of one head-master, two skilled carpenters and 4 teachers for general subjects. There are only 16 pupils in the school, admission being restricted to carpenter's caste only. The boys are given scholarship and are provided with the necessary tools. The institution might easily be reorganised on a more effective basis and such reorganisation is necessary.

Weaving.—Weaving is carried on as a cottage industry in almost all the panchayats of the taluk. The yarn is purchased from merchants in Quilon. At Ithikara there is a weaving school under the management of Mother Pauline. Here towels, dusters, country clothes, jamkals, etc., are made at very reasonable rates. Weaving in this taluk is not undertaken by organised communities and a central co-operative depot for cottage industries would greatly help the work forward. Among them Paravur, Mayanad, Nedumpana, Vadakevila, Kilikollur, Kothankara may be taken as important places. Articles for which there is local demand are chiefly woven. There is a weaving school at Mayanad. The strength of the school is 66 pupils and two teachers are employed.

Lace and Embroidery.—There is a small settlement of lace-makers at Quilon. This is under the management of some Indian Firms who employ from 150 to 200 persons. Their

average pay varies from $2\frac{1}{2}$ to $3\frac{1}{2}$ As. per day and the quality of the goods manufactured is such as to secure great durability but little variety of pattern. No organised means of teaching the industry exists and new patterns are only attempted at the request of customers. The lack of organisation is felt very acutely here.

There is an orphanage near Kumbalam where lace making is taught to girls. There are in all about 50 girls learning this industry. This industry has been very recently started in this school. Besides this the orphans are taught reading, writing and arithmetic. The St. Josephs Technical School at Quilon also has classes for lace and knitting under properly qualified teachers. The market for the Quilon lace workers is found by travelling agents who move about and obtain orders. The cheapness of the work effects a fair sale for it. Rev. Father Philipose Panikar has introduced machine knitting near Kundara. Socks, stockings and other articles are made. This is only a small cottage industry ; but is capable of great improvement. A few persons have been taught this industry and it is to be commended as admirably suitable for middle class home workers. Proper market patterns and proper raw materials are badly needed.

Pottery.—Potters are found in Athichanallur pakuthi and pottery work is carried on as a cottage industry. The demand for the goods is purely local.

Fishery & Fish-curing.—Both backwater fishing and coast fishing are carried on in the taluk. Fish oil is made locally by the fishermen and sold to boat-men for coating their boats. Some thousands of fishermen are found here. The average earning may be estimated at Rs. 7 a month. Fish is cured and exported in small quantity to inland places.

Tanning.—Skins and hides are obtained in quantity in the taluk and are now exported. Tanning can be introduced in the taluk with advantage. There is already a local project for this to be established here.

Cabinet making.—Besides the large firms, there are several smaller enterprises where furniture is made. Two small workshops are established in the town of Quilon each employing up to one dozen men. The industry has excellent chances of successful development here.

Gold and silver works.—There are over 100 skilled silver and goldsmiths in the taluk. Special mention might be made here of the work of Messrs. Krishna Sait & Co., of Quilon. They do a large trade in the manufacture of silver chuckram work articles. Medals have been awarded at Madras, Delhi, and other exhibitions. The industry is flourishing and is well managed and developed.

Foodstuffs used and available locally.—Rice, tapioca, cocoanut, peas, yams, vegetables and fish.

Economic Statistics.

The agriculturists can be estimated at above 40,000. The distribution of artisans is set out as below:—

Carpenters.	1400 approximately.	12 As. a day.
Masons.	350 „	8 As. 12 As. a day.
Coir makers.	Some thousands.	Rs. 5 a month.
Weavers.	170	Rs. 9 a month.
Copra makers.	200	Rs. 15 a month.
Oil pressers.	Some hundreds.	Rs. 10 a month.
Blacksmiths.	200	Re. 1 to Re. 1 As. 4 a day.
Goldsmiths.	140	Rs. 2 a day on an average.
Fishermen.	Some thousands.	Rs. 7 a month.
Coolies.	Some thousands.	8 Chs. per day.
<i>Cost of living.</i> —Cultivator's family.		Rs. 30 a month.
Single person.		Rs. 8 a month.
Cooly's family.		Rs. 7 a month.
No. of Voters.		134.
No. of Professional men.		Some hundreds.
No. of merchants.		Some hundreds.

Co-operation.

	Members.	Capital. Rs. as.	Profit. Rs. as.
Sri Krishnavilasom Co-operative Credit Society.	38	1991 8	1 6
Sri Rama Varma Co-operative Distributive Society.	.		
Quilon Co-operative Society & Stores Ltd.,	40	609	86 12

Joint Stock Companies.

	Authorised Capital. Rs.	Subscribed Capital, Rs.	Paid up Capital. Rs.
Thomas Stephen Co., Ltd., Quilon.	2,50,000	84,000	83,950
Travancore Produce & Industrials Ltd.,	5,00,000	31,500	12,600
The Commercial Union Ltd.,	5,00,000	68,180	27,272
The Malabar Industrial Co., Ltd.,	4,50,000	51,590	20,636

Capital and Remarks.

The total co-operative capital is Rs. 1700 as. 8. The total joint-stock capital subscribed is Rs. 2,35,270 of which Rs. 1,44,458 have been paid up. More capitalists can be found and the capital will be fourth-coming from here if possible industries are demonstrated here. A member of one of the leading firms of Quilon stated that they are handicapped by the scarcity of railway waggons for transit of goods and

this is perhaps true. The war is largely responsible for this and time will no doubt rectify their complaint. It would be a great help to the Saw Mills if transport for logs was provided at Tenmalai, Punalur, Edamann stations when buying the timber from the coupes. The taluk has great possibility of success. It is a rail level has sea and backwater transport and fuel is not far away. Quilon is undoubtedly a good place to start new industries.

KARUNAGAPALLY TALUK.

Area 88.99 Sq. miles. Population 1,33,550.
 No. of houses 27,666. No. of Pakuthies 12.
 Taluk town Padanayarkulangara. No. of Voters 243.

Location.

Division.—It forms one of the western taluks of the Quilon Division.

Boundaries.—NORTH.—Karthigapally Taluk.

SOUTH.—Quilon Taluk.

EAST.—Mavelikara and Kunnathur Taluks.

WEST.—The Arabian Sea.

Railway.—There is no railway passing through the taluk. The nearest railway station is at Quilon and is 14 miles distant from the taluk town. It is reached by backwater. Kayankulam is 22 miles from Quilon by backwater.

Backwaters and Rivers.—Kayankulam lake extends over to Ayiramthengu and the Ashtamudi lake to Chavara. These two lakes are connected by canals. This is the main waterway in the taluk. There are numerous canals leading to the different parts of the taluk. Chavara canal and Ponmana canal are the most important. The Pallikal Aar passes through the middle of the taluk and falls into the backwaters near Karunagapally. It is navigable for a small distance. Near Kollakadavu there is a rapid descent of the river. Kayankulam is now connected with Quilon by a regular daily motor boat service. In any case the distance by vallam is only 22 miles.

Main Roads and Village Roads.—The road from Chavara to Kayankulam passes direct to the north dividing the taluk into two almost equal portions. The village roads are small and many are unfit for cart traffic. Most of the village products have to be taken by head-load.

Sea-port.—Quilon is the nearest seaport. It is reached by water, the distance being 14 miles. Alleppey is largely used as this is the greatest coir centre.

Cultivation.

Wet land area.—21,190 acres. Dry land area.—27,047 acres.
Cocoanut area.—26,440 acres. Unregistered land area.—

1,11,029 acres.

Pakuthies.

Name of Pakuthy.	Area. Sq. miles.	Popu- lation. Per- sons.	Wet land. Acres.	Dry and. Acres.	Cocoa- nut area. Acres.
Chavara ...	4.62	10420	1069	1777	1767
Thekumbagom ...	7.82	7290	166	1848	1740
Karunagapally ..	8.20	15260	2313	1943	1898
Krishnapuram	9.61	15670	2963	2854	2800
Kulasekarapuram ...	7.31	13210	2380	1908	1851
Ponmana ...	6.57	12820	1835	2176	2165
Pudupalli ...	7.78	10690	1563	1594	1441
Perunadu ...	6.06	11960	2185	1459	1414
Tazhava ...	9.18	9830	2612	2897	2893
Todi ...	8.00	7830	1853	2824	2728
Tevalakara ...	6.23	10030	1006	2347	2331
Minagapally ...	7.61	8550	1243	3420	3414

Education.

GOVERNMENT VERNACULAR SCHOOLS.

No. of H. G. Schools, 8. 2628 boys. 297 girls.
No. of L. G. Schools, 21. 3385 „ 738 „

AIDED SCHOOLS.

No. of L. G. Schools 33. 2064 boys. 1046 girls.

UNRECOGNISED SCHOOLS.

No. of Schools 17. Total No. of pupils 805.

GOVERNMENT VERNACULAR SCHOOLS FOR GIRLS.

No. of H. G. Schools 4. 1276 girls.
 No. of L. G. Schools 3. 282 girls.

GOVERNMENT ENGLISH SCHOOLS.

No. of H. G. Schools 2. 568 boys. 62 girls.

AIDED.

No. of L. G. Schools 2. 190 boys. 23 girls.

UNRECOGNISED.

No. of L. G. Schools 2. 65 boys. 3 girls.

INDUSTRIAL SCHOOLS.

Sripadmanabhavilasom Mat Weaving School. Tazhava.
 Attached to the Tazhava Vernacular School.

2 Teachers. Mat weaving. Grass and Screwpine mats.
 Kollaka Weaving School. 20 pupils. 2 Teachers.
 Hand-loom weaving.

Natural products and their present utilisation.

Paddy.—There are 21,190 acres of paddy land in the taluk of which 4600 acres are single cropped and the remaining double cropped. The paddy grown locally is not sufficient for local consumption and consequently rice and paddy are imported from Alleppey and also from Cochin. To increase the production of paddy intensive cultivation has to be adopted. Proper manuring and improved agricultural methods could be introduced with profit. Government have established a manure depot at Kayankulam.

Cocoanut.—This taluk stands second among the cocoanut growing taluks of the State. The area under cocoanut cultivation is 26,440 acres and the number of trees can be estimated at about 11 lakhs. Copra making is carried on to a large extent in the taluk and coir industry is also thriving well. Soaking facilities are very good everywhere throughout the taluk. From some interior parts of the taluk the husks are exported raw to Kayankulam and other places to be soaked and beaten into coir.

Tapioca.—This is cultivated in all the compounds to a small extent. Large plantations are not found in the taluk. It is locally consumed and there is not much grown for export purposes. In the eastern parts of the taluk cultivation can be extended. The root from here could be utilised to

supply a factory for tapioca flour situated in Central Travancore. Tapioca root in normal times cost only $\frac{1}{4}$ to $\frac{1}{2}$ chs. a pound.

Arrow-root.—Arrow-root grows wild in all parts of the taluk but little use is made of the material at present. The flour is extracted as a cottage industry only.

Screw-pine.—A large number of screw-pine plants grow here and the leaves are used for making mats. Fine varieties of screw pine mats are made and are sold in quantity at Kayankulam market for export to all parts of Travancore, Cochin and Malabar. The mats are brought up by wholesale merchants direct from the workers who bring them to the market.

Grasses.—Grasses suitable for mat making are grown in quantity in this taluk. Grass mats are manufactured in the locality and sold for export to various parts of Travancore.

Sugar-cane.—This is grown in Todi pakuthy to a small extent and is utilised for the manufacture of molasses. The crushing is effected in bullock-driven mills and the juice is boiled down and molasses prepared. Muzhankodi molasses are well known for quality and are amongst the best molasses produced in Travancore. The quantity produced however, is small and consumed locally. Further development of this might easily be made with profit and small sugar machines installed. (See Ettumanur Taluk).

Pepper.—Pepper is cultivated in fair quantity in the taluk and the major portion of it is exported to Alleppey. Formerly much larger quantity of pepper was grown but the industry has declined considerably. The pepper cultivation was mainly in the coconut topes. The variety grown commanded a good market and if the industry was revived the trade could soon resume its former standard.

Other products.—Arecanut, jack, plantain, mango, yams of various kinds, cashew-nuts, tamarind, etc.

Trees. (Oil bearing).—Marottie and pinnay are found in large numbers. The oil is expressed locally in bullock-driven presses, of which large numbers are found. The surplus is exported.

Other trees.—Anjili, jack, Odum, Kapok cotton.

Minerals.

No mineral of note has been found in the taluk but large quantities of clay for pottery are available. Pots glazed with yellow shining material are made in the taluk and this is found to be a mixture of coloured mica and clay. It was reported that during the dry season the water from a temple well near Krishnapuram was mixed with some mineral oil floating on the surface which had the smell of kerosine oil. On investigation during the rainy weather no trace of oil was found. The depth of the well was 15 feet. The well is situated near the paddy fields and at intervals of 6 ft. in depth black clay is found which seemed carbonaceous. No definite conclusion can be arrived at but further investigation is proceeding.

Existing and possible Industries.

Agriculture.—The area under paddy cultivation is 21,090 acres and the major portion is double cropped. The area under cocoanut cultivation is 26,440 acres. These are the important occupations of the people. About 30,000 people are working in the fields and many more in cocoanut topes. The average income of an agricultural labourer is Rs. 6 a month. This is barely sufficient for him and his family. Generally the women of the house also help him in the fields or by mat-making and earn Rs. 4 a month. Thus the family is maintained. The taluk is a rich one and contains 343 voters. About 200 persons can be styled as rich among them and receive large incomes from various sources, chiefly from the land produce. The agricultural implements are generally bought from bazaars in Alleppey and Quilon and repairs are done by local blacksmiths and carpenters. There are about 300 carpenters and about 100 blacksmiths in the taluk. The average earning of a carpenter is 8 As. a day and that of a blacksmith 10 As. They however, have the same faults as in other places. Agriculture in this taluk is most profitable and if better manuring, etc., were done the quantity of food-stuffs produced could be greatly enhanced.

Cocoanut Industries.—Copra making is carried on to a large extent in the taluk. Some hundreds of people are engaged in this industry. The average earning of one person engaged is about Rs. 30 a month. The copra is sold in Alleppey and Quilon and some of it is used in the local bullock-driven oil presses. The large rainfall here often renders copra

drying in the sun very difficult. The method is therefore utilised of having tables 3 ft. high made of perforated wire. Fires using cocoanut shells as fuel are lit below and the copra is gradually dried. This method is much quicker than that of sun drying and large quantities are so produced. The Kayankulam market is the chief buying place and large quantities are offered for sale every week.

Oil-pressing.—As already noted oil pressing is carried on as a cottage industry in all parts of the taluk. Some hundreds of oil presses are found in the taluk. A major portion of the oil thus produced is consumed in the locality. The average earning of an oil monger is about Rs. 12 to Rs. 15 a month. In most of the cases the oil-mongers buy cocoanuts and make their own copra for pressing. The bullock-driven mills only are used and mechanical power has not yet been introduced here.

Coir-Industry.—Coir making is carried on as a cottage industry by many thousands of people in the taluk. Soaking facilities are excellent and the coir industry is thriving. The average earning of a worker is about Rs. 3 a month. The beating and manufacture of coir yarn is carried on mainly by the women of the family. Most of the coir yarn, coir fibre etc., are sold to local merchants who export them to Alleppey and Cochin and Quilon. The price of coir yarn in 1918 was Rs. 50 per candy. In Perunadu pakuthi there is an industrial institute where coir industry, wood-carving, button making, pen holders making are taught. Ochira has a small school for such industries. The place is well known for its biennial Industrial Exhibitions which are a great success. The district abounds in skilled artisans in various crafts.

Mat-weaving.—The screw-pine is grown in large numbers in all parts of the taluk. The leaves are collected by the local people prepared and made into mats. Two kinds of mats are made the one with leaves dried in the sun and the other by boiling and preparing the leaves. The first kind is rough and is used for packing and as a cheap bedding for poor people, the other variety is very soft and is in great demand by the public at large.

There is a mat-weaving school in Tazhava. It was opened in 1091. Two trained teachers are employed in the school for teaching mat-weaving. The school is attached to the Adithiyavilasom Vernacular school and all the people of

the school are taught mat weaving. Besides screw pine mats weaving of grass mats is also taught to the people. Grass is obtained locally in quantity and grass mats also are made in large numbers in this taluk. The mats are exported to Alleppey, Cochin and Quilon. Many thousands of people are engaged in this industry. The average earning of a leisure time worker is between Rs. 3 and Rs. 4 a month. The ordinary weaving is done chiefly by women whilst the men of the household finish off the edges and prepare the raw materials. Full notes on this industry are found in Mavelikara taluk. In this taluk other articles may be made out of screw-pine namely bags, baskets, etc., if proper instruction is given to the people in industrial schools. The stem of the screw-pine can be utilised for extracting fibres which can be used for brush making and other purposes.

Weaving.—This industry is carried on in Chavara, Karunagapally, Perunadu, Todi and Thevalakara pakuthies. In all of them weavers are found working and not in big communities. The weavers generally make coarse kinds of cloth and sell them locally. There is a weaving school run by private agency in the taluk called the Kollaka weaving school. It was started in 1092 and has a strength of 20 pupils. Two trained teachers are employed in the school and hand loom weaving is taught. The school is in a thriving condition and the local weavers are kept in constant work. Their monthly profit amounts to about Rs. 10 to Rs. 12.

Bronze work.—Bronze work are found in Karunagapally and Minagapally pakuthies. The finish of the work is good and there is much local demand for the materials. Those workmen are not rich and work only when orders are given. In the majority of cases the raw materials are supplied to them with the orders. They secure enough work to keep them throughout the year. The average wages of a bronze worker can be estimated at Rs. 15 a month when he is in full employment.

Basket making.—Basket making is done on a scale in Thevalakara and Perunadu pakuthies. The raw material used being Reeds from the backwaters. The baskets are sold in the local bazaars and markets and are made only to meet local demands. This could be developed considerably with profits.

Molasses making.—The preparation of molasses from sugarcane is carried on in a small scale in Todi pakuthi.

The cane is grown locally on the banks of the Pallikal Aur. The cane is crushed in bullock driven mills and the expressed juice boiled down to molasses. The quality of the article made is good. Muzhangudi molasses are wellknown for their excellent quality.

Toddy drawing.—A large number of people are engaged in toddy drawing. Both sweet toddy and fermented toddy are obtained. The former being used for the manufacture of jaggery and the latter for drinking purposes.

Fishery.—There is a large number of back water fishermen in the taluk. The industries of fishing and fishcuring are in a flourishing condition in the taluk. The products so obtained are sold locally and cured fish is also exported to Alleppey and Quilon. The fishery industry could be largely developed in the taluk. The fisherfolks are as a rule very poor and earn Rs. 7 per mensem.

Cocoa and Tonic food.—A small company has started a business here for the manufacture of cocoa. The first attempts were made with cocoa beans obtained from Ceylon and were fairly successful. The oil was not fully expressed. Recently a new crusher and rollers have been installed and the quality is greatly improved. Attempts are also being made to grow the beans locally. The preparation of tonic food for invalids from plantain has also been successfully attempted. The quality of the preparation is good and large sales have been made. The business needs capital and advertisement. At present it is housed in a building set apart for the purpose. The products are neatly packed in tins of local make.

Printing.—One or two good printing establishments are found in the taluk. The business established in Kayana kulam is especially good and is able to tackle the better classes of work. It is known as the "Suvarna Ratna Prabha Press".

Foodstuffs available and used locally. Rice, tapioca, yams, coconuts, vegetables, and fish.

Economic Statistics.

There are about 35,000 men engaged in agriculture. The artisans skilled in other kinds of work can be roughly divided as below :—

Carpenters	300	10 Chs. to 14 Chs. a day.
Masons	200	10 to 14 Chs. a day.

Coir makers	Some thousand	
Copra makers	Some hundreds	
Oil mongers	250	Wages vary generally Poonack and portion of oil given.
Mat-makers	Some hundreds	
Basket makers	150	Rs. 3 per mensem.
Toddy drawers	100	Wages vary. Usually paid in kind.
Fishermen	2000	Rs. 7 per mensem.
Goldsmiths	30	Rs. 15 per mensem.
Blacksmiths	100	8 to 12 As. a day.
Coolies	Some thousands	Rs. 4 to Rs. 5 per month.

Professional Gentlemen.—As this is a big market centre there are a large number of merchants who are not classified above. There are also about 500 or more officials, Vakils, etc. The number of voters is considerable and is approximately 243.

<i>Cost of living</i> —Cultivator's family	Rs. 30 for an average family.
Single person	Rs. 8 per mensem.
Cooly's family	Rs. 7 per month.
<i>Number in family</i> —Cultivator's family	Five persons on an average.
Cooly's family	Three persons.

Co-operation.

Two societies are registered at present.

	Members.	Capital.	Profit.
The Ochira Srimoolavilasom Co-operative credit Society	100	Rs. 4680/12.	Rs. 150/12.
Lakshmivilasom Agricultural Co-operative Society.	35	Rs. 4324	Rs. 99/12 loss.

Joint Stock Companies.

There are no Joint-stock Companies registered in the taluk but a number of private concerns are working well.

Capital and Remarks.

The total co-operative capital is Rs. 9004/12, and there is ample scope for further development of co-operation, both for agricultural and cottage industries. The establishment of a depot for screw-pine workers and various other industries would be of great advantage. The town of Kayankulam is the outlet for much of the produce of Central Travancore. Large quantities of screw-pine mats, lemon grass oil, etc., are available annually. In fact, it is the centre of all business in the district. Copra, coir and oils are also exported largely. Candle and soap-making would undoubtedly succeed here and an attempt was made to get a local man to go for training in their industries but without success. Up to the present the capital necessary for industrial development is to be found in the taluk but demonstration is badly needed. A land bank would greatly assist in the creation of floating capital and co-operation should be developed more fully. The taluk would produce more foodstuffs if manuring was properly done. Agricultural depot efforts here have done much in this direction and their advice has led to fruitful results. The people need however, to actively co-operate with themselves and Government depots to make the work successful.

CHENGANNUR TALUK.

Area, 925.97 sq. miles. Population.—1,89,900. No. of Houses, 35,159.

No. of pakhuthies, 16. Taluk town. Chengannur.
Location.

Division.—This taluk forms the north-eastern portion of Quilon Division.

Boundaries.—NORTH—Tiruvella and Peermade Taluks.

SOUTH—The Achenkoil River divides this taluk from Pattanapuram, Kunnathur and Mavelikara.

EAST—Tinnevely District.

West—The Achenkoil river divides the taluk from Tiruvella and Mavelikara.

Railway.—The nearest railway station is Kottarakara and is $28\frac{1}{2}$ miles distant from Chengannur. The main central road connects Chengannur to Kottarakara. Two daily services of motor busses connect Chengannur direct with the rail.

Backwaters and Rivers.—This taluk lies inland and is not reached by backwaters. The Pampa river flows through the northern portion of the taluk and is the main water-way. It is navigable for boats for a long distance up to Ranni. The Achenkoil river forms the southern boundary of the taluk. It is also navigable for a long distance. Chengannur is reached by water from Alleppey. There is regular vallam service from Chengannur to Alleppey and back. The distance from Alleppey to Chengannur is 24 miles by water. The river at Chengannur is now being bridged and when complete will be of great benefit for traffic.

Main Roads and Village Roads.—The main central road passes right across the western portion of the taluk, connecting Pantalam, Vadakekara and Chengannur. From North Pantalam one road goes to Aranmula, another to Konni and Ranni. Another road goes to Mavelikara from the same town. There are good roads fit for cart traffic. Many of the village roads are in poor condition and most of the produce from the villages is taken to the markets by head load. The roads to the plantations in the eastern portion are cartable.

Nearest seaport.—Alleppey is the nearest seaport. It is about 24 miles distant by water. In certain cases the produce is taken to Changanacherry by carts and exported to Alleppey. The main reason for this is that during the dry weather big vallams cannot come right up to Chengannur for want of sufficient water in the river and during the rainy season the current of the river is so great that big vallams take a long time to reach the place. Smaller vallams ply between the two places at all time with small loads.

Cultivation.

Wet land area. 14,589 acres. Dry land area. 74,141 acres. Cocoanut land. 8423 acres.

Pakuthies.

Name of pakuthy.	Area.	Popula- tion.	Wet land.	Dry land.	Cocoanut land.
	sq. miles.	persons.	acres.	acres.	acres.
Tiruvammandur.	3.51	4700	1298	702	15
Omallur.	13.36	55000	963	6846	536
Puthenkavu.	11.45	9630	934	6113	4251
Vadakekkara	5.22	11090	680	2175	1700
Pandanadu.	4.09	5000	1458	640	131
Chengannur.	5.16	11450	1610	1367	300
Puliyur.	4.59	5340	1358	1385	115
Ranni.	87.66	25000	644	25625	265
Ilanthur.	6.83	7120	516	3074	233
Kumbazha.	32.94	12130	900	11764	231
Pattanamtitta.	5.54	6000	483	2256	115
Venmini.	7.17	7400	847	3137	793
Pandalam Vadake- kara.	11.66	9700	940	5760	75
Cheriyannadu.	5.63	8420	1163	1922	80
Ala.	4.16	11940	796	1678	550

Education.**GOVERNMENT VERNACULAR SCHOOLS.**

No. of H. G. Schools,	13.	3056 boys. 592 girls.
No. of L. G. Schools,	28.	3621 boys. 1167 girls.

AIDED.

No. of H. G. Schools,	2.	102 boys. 12 girls.
No. of L. G. Schools,	67.	3891 boys. 1783 girls.

UNAIDED.

No. of Schools,	2.	Total No. of pupils,	65.

GOVERNMENT VERNACULAR SCHOOLS FOR GIRLS.

No. of H. G. Schools,	2.	646 girls.
No. of L. G. Schools,	12.	1302 girls.

AIDED.

No. of L. G. Schools,	3.	222 girls.

GOVERNMENT ENGLISH SCHOOLS.

No. of H. G. School,	1.	552 boys. 36 girls.
No. of L. G. School,	1.	123 boys, 7 girls.

AIDED.

No. of L. G. School.	1,	89 boys. 11 girls.

UNAIDED.

No. of L. G. School,	1.	35 boys, 6 girls.

GOVERNMENT ENGLISH SCHOOL FOR GIRLS.

No. of L. G. School,	1,	129 girls.

There are no industrial schools in the taluk.

Natural products and their present utilisation.

Paddy.—There are 14,589 acres of paddy land, of which more than 90 per cent. is double cropped. All the paddy grown is consumed locally. The paddy grown is not sufficient for local consumption. A large quantity of paddy and rice is imported into the taluk from Alleppey. Paddy is husked by the people by the ordinary country method and there are no husking or hulling machines working in the taluk.

Cocoanut.—Cocoanut trees are cultivated on the banks of the two rivers to a fairly large extent. There are in all about 8423 acres under cocoanut cultivation. The trees are in a flourishing condition, and they number about 3 lakhs. Copra-making, coir-making and oil-pressing are carried on in the taluk and the cadjans are utilised for thatching the roofs of houses. One of the chief difficulties however is want of soaking facilities. A coir extractor would greatly help the industry here.

Arecanut.—In the majority of cases, arecanut trees are planted by the side of cocoanuts. There are over 6 lakhs of arecanut trees in the taluk. The nuts are gathered in time, boiled in water and dried in the sun. The prepared nuts are exported to Cochin and Alleppey.

Sugar-cane.—Large plantations of sugarcane are found on the banks of the rivers. The growing of sugarcane is a flourishing industry in the taluk, and a large area is under

cultivation. The canes are crushed in bullock-driven crushing mills and the juice boiled down for the preparation of molasses. Most of the molasses used in the taluk is obtained locally. There are great possibilities for increasing sugar-cane cultivation and a small sugar factory could be established either here, or in Tiruvella with profit. Probably the installation of small machines as advised in Ettumanur Taluk would be of advantage.

Tapioca.—Tapioca is cultivated largely in almost all the parts of the taluk. Besides local consumption it is also grown for export. A large quantity of it is exported to Alleppey and other places. For export purposes it is sliced and sun-dried. No attempt has been made to convert the yams into flour. The cultivation could be greatly increased and if a tapioca flour factory is established near Tiruvella, this demand can be supplied largely from this taluk. This is a most favourable neighbourhood for the development of the tapioca flour industry.

Arrow-root.—Arrow-root is grown wild throughout the taluk but little attention is paid to it. It is neglected by the people and at present is of little value commercially. Some people, however, prepare arrow-root flour and sell it in the local markets. Their methods are crude and no uniform quality can be obtained. Large orders cannot be executed as the workers are scattered and the quantity produced is very small. If a tapioca flour factory is established, arrow-root should be properly cultivated so that it can be converted into flour in the factory in the same way as tapioca.

Pepper.—The pepper vine is cultivated fairly largely in many parts of the taluk. The seeds are collected by merchants from the different cultivators, dried and exported to Alleppey. In many cases raw pepper is brought to the market by the cultivators and is sold to the merchants for export. Little of the pepper is consumed locally. Puthenkavu and Pattanamthitta pakuthies can be mentioned as being particularly suited for the cultivation as also portion of Ranni valley.

Fruits.—Plantains and bananas are cultivated in large numbers in the taluk. The fruits produced are exported to Changanacherry and Alleppey after meeting with local demands. There is large scope for a fruit-preserving industry in the taluk for both the fruits and sugar-cane are obtained locally.

Pine-apple, jack and mangoes are obtained in quantity.

Other products.—Yams of various kinds Chama, peas, gingelly and gram.

Rubber.—Several rubber plantations are found in Ranni Pakuthy. The total area under rubber is 1815 acres but recently this has been greatly increased. The two large estates are under European management and are thriving. The area under rubber can be greatly extended and recently several Indian Companies have begun work in this district. This is greatly commended and encouraged. The manufactured rubber is exported to Europe.

Trees and Timber.—Marottie, Puvam, cashew-nut, Jack, mango, pine, black-wood, teak, and other forest trees and bamboos and reeds are found in quantity. The eastern portion of the taluk contains a large forest area.

Minerals.

Graphite is found in North Pandalam but is not worked.

Good clay suitable for pottery is found in most of the parts of the taluk.

Traces of mica have also been observed.

Existing & Possible Industries.

Agriculture.—This is the main industry of the taluk. Over 40,000 persons are engaged in agriculture. The area under paddy cultivation is 14,589 acres. Besides this, many people are engaged in cocoanut, tapioca, sugar-cane, plantains, yams and rubber plantations. There are about 100 landlords in the taluk receiving about Rs. 1000 a year. The agricultural labourer receives Rs. 10 a month on an average but he does work in his own compound during leisure time and earns an additional income from the sale of vegetables produced. Most of the agricultural implements are imported from Quilon and Alleppey. The local smiths and carpenters repair them. The average earning of a smith is 20 rupees a month, and that of a carpenter Rs. 15 for the same period.

Cocoanut Industries.—Copra-making is carried on in three pakuthies namely Chengannur, North Pandalam and Pandanadu. The number of persons engaged in this industry can be estimated at about 300. The average income of

one person in this industry is about Rs. 20 a month. In the local presses, much of the copra is pressed for oil and the oil is used in the locality. Some of the copra is exported to Alleppey. No power press is working.

Coir making.—Coir-making is a small industry in the taluk and it engages only about 300 persons. This industry does not thrive properly for want of soaking facilities but if machines are introduced for the extraction of coir fibre, it can be made a good industry in the taluk. At present most of the husks are used as fuel. The average earning of a coir maker is Rs. 5 a month. This work is mainly done by the women of the low caste Hindus and is a source of additional income to their families. The market for the manufactured articles is only a local one. North Pandalam, Pandanadu and Chengannur are the chief pakuthies where coir industry is carried on.

Tapioca Industry.—Only small cottage workers in the taluk are preparing tapioca flour even though a large quantity of the raw material is produced. The establishment of a factory either here or in the neighbourhood will be advantageous. The tapioca at present is dried and exported by water to Alleppey. The whole taluk contains large areas where tapioca root could be grown and the industry could be developed thoroughly here with advantage.

Weaving.—Isolated weavers are found in many of the pakuthies of the taluk namely Omallur, North Pandalam, Pandanadu, Chengannur, Ranni and Elanthur. A weaving institute was established in Chengannur, but it was transferred to Alleppey lately. Half a dozen looms and two spinning machines are still found in a broken down building as the remnant of the institute. It had really to be closed here for want of working capital. Silk weaving was also carried on in the taluk but that has also ceased. The existing weavers are scattered about the taluk and they weave only rough cloth such as towels, thorthus, etc. The articles are sold in the local bazaars. In all about 150 weavers can be found in the taluk. They have no organisation and are badly in need of co-operative depot to develop their industry. Rs. 8 to Rs. 11 per mensem are the limits of their average earning.

Pottery.—There are approximately 70 potters in the taluk. They supply the local demands in pottery. Tiruvammandur and Culichery are the two important pakuthies where pottery work is carried on largely. On the average a potter

realises Rs. 7 a month. Glazed pottery could be made here with profit.

Mat-making.—Bamboo mats and screw-pine mats are made to a limited extent in the taluk. The reeds are brought from the forests by the people themselves and are made into mats. They find a ready sale in the local markets. The price of mats varies from 3 chs. to 7 chs. each. This industry is carried on by low caste Hindus and chiefly the women folk of the community.

Rattan work.—A total of about 50 persons are engaged in this industry. They supply the local demands only. Baskets, chairs, rattanning wooden chairs and sofas are the chief product of their work. The raw materials are brought direct from the forests by the people themselves. In certain cases they are bought from Alleppey from merchants who deal in the raw materials.

Bronze work.—In all there are approximately 60 persons engaged in this industry. They are found isolated and scattered about. The bronze workers are poor and mostly live from hand to mouth. They do not possess initial capital for carrying on their work on a commercial scale. They work when orders are in hand and not otherwise. They depend only upon local demands and consequently their work brings them only minimum wages. The buyers supply them with the raw materials and a small sum of money in advance. These workmen have no idea of punctuality and are in many cases unreliable. This defect spoils all their work. Some of them are good workmen and when in full work they realise Rs. 30 a month. The method of working is the same here as elsewhere. The moulds are made of a mixture of cow-dung and the fragments of broken earthenware pots ground to powder. The whole mould is lined with wax. On pouring the molten alloy into the recess full of wax the latter is melted away and the brass remains in its place. The mould is then broken away and the casting cleaned and polished.

Tanning.—A chrome leather tannery has been working successfully for some time in Chengannur. The raw hides are obtained locally in quantity and up to 150 hides are dealt with per month. Boots and shoes were also made. Between one and two hundredweights of tanning materials were used per mensem. The wealth of indigenous tanning materials is used here and it would be of advantage if the local tanneries were developed in the use of these materials as tanning media.

Bee-Culture.—A large quantity of honey is obtained from the Reserve Forests of Ranni. Bee-culture can be introduced as a cottage industry in the taluk preferably near Ranni. As soon as the Nedumangad Apiary is successful that the industry will also be opened out here.

Lemon Grass oil.—Lemon grass and another variety known as Kala grass are found in quantity in the taluk. In a small scale the distillation is carried on, but the cultivation can be extended and the distillation of the oil carried on to a much greater extent. This needs the earnest attention of all as a valuable product is being ignored at present.

Foodstuffs used and available locally.—Rice, tapioca, yams, plantains, jack, mangoes, cocoanuts etc. Flesh and fish are also consumed largely.—

Economic Statistics.

There are about 40,000 persons engaged in agriculture. The other skilled artisans are set out as below:

Carpenters	800.	8 As. to 10 As. a day.
Masons	100.	6 to 8 As. a day.
Potters	70.	Rs. 7 a month.
Mat-makers	100.	Rs. 5 a month.
Copra makers	300.	Rs. 20 a month.
Coir makers	300.	Rs. 5 a month.
Rattan workers	50.	
Bronze workers	60.	Rs. 15 a month on an average.
Blacksmiths	70.	Rs. 20 a month.
Goldsmiths	60.	
Weavers	160.	
Coolies	Some thousands.	7 Chs. a day.

<i>Cost of living.</i> —Cultivator's family.	Rs. 25 a month.
Single person.	Rs. 8 a month.
Cooly's family.	Rs. 6 to Rs. 7 a month.

<i>No. in Family.</i> —Cultivator's family.	Five persons.
Cooly's family.	Three to four persons.

No. of Voters. 119.

Co-operation.

There are no co-operative societies in existence in the taluk.

Joint Stock Companies.

	Authorised Capital.	Subscribed Capital.
The Travancore Industrial Co., Ltd., Chengannur.	Rs. 2,00,000.	Rs. 10,250.

Capital and Remarks.

The total capital subscribed in an industrial concern is Rs. 10,250 and this is mainly for rubber plantation. Large areas could be brought under tapioca cultivation which are now lying fallow. If this is done then a tapioca flour factory would pay well if established in the district. The other points are already mentioned. Capital available is not great but much more could be done than is found at present. A co-operative depot for cottage industries is an essential.

PATTANAPURAM TALUK.

Area 425.67 Sq. miles.	Population 56,710, persons.
No. of houses 18,310.	No. of Voters, 8.
No. of Pakuthies 8.	Taluk town Punalur.

Location.

Division.—The taluk is situated in the eastern portion of the Quilon Division.

Boundaries.—**NORTH.**—The Atchankoil River divides this taluk from Chengannur taluk in the north.

SOUTH.—Nelumangad and Kottarakara taluks.

EAST.—Shencottah Taluk and Tinnevely District. A tributary of the Atchankoil river divides this taluk from Shencottah.

WEST.—Kunnathur and Kottarakara taluks.

Railway.—The Trivandrum-Shencottah Railway runs through the middle of the taluk from west to east. There are four railway stations in the taluk namely Avaniswaram, Punalur, Edamann and Tenmalai. The taluk is mountainous and the population is small.

Backwaters and Rivers.—This is an inland taluk and has no backwaters. The rivers found here are not suitable for navigation as they are only near their sources in most

cases. The Kallada river is the most important among them and it flows from east to north-west. There is a rapid descent of the river near Punalur and this affords power for the Paper Mill. The Atchankoil river divides this taluk from Chengannur in the north. The Ittikara Aar divides a portion of Pattanapuram from Kottarakara taluk.

Main Roads and Village Roads.—Parallel to the railway there is a good main road running from Quilon to Shencottah. From Punalur one road runs north to Pattanapuram and Adur and another goes south to Trivandrum. They are in good condition and fit for all traffic. A branch of the Punalur-Trivandrum road runs east to Kulathupuzha and to some of the estates to Shencottah. The village roads are fair for cart traffic. The question of new roads for opening out the district should be considered.

Nearest Seaport.—Quilon is the nearest seaport and is reached by railway from Punalur. The distance from Punalur to Quilon is $28\frac{1}{2}$ miles of which 28 miles are by railway. The backwaters are easy of access direct from the rail.

Cultivation.

Wet land area.—10,503 acres. Dry land area.—40,100 acres. Unregistered land area.—1,30,590 acres.

Pakuthies.

Name of Pakuthy.	Area. Sq miles.	Wet land area. Acres.	Dry land area. Acres.
Mailam ...	10·71	1247	5157
Pattazhi ..	15·34	38	151
Talavur ...	8·78	958	3441
Anjal ...	203·54	2521	9186
Idamalakkal ...	14·93	1200	4505
Vallakudi ...	8·29	800	3077
Punalur	22·50	1615	6950
Pattanapuram ...	141·58	2123	8631

Education.

GOVERNMENT VERNACULAR SCHOOLS.

No. of H. G. Schools.	3.	896 boys.	155 girls.
No. of L. G. Schools.	11.	1023 „	283 „

AIDED.

No. of L. G. Schools.	16.	822 boys.	211 girls.

UNAIDED SCHOOLS.

No. of Schools.	5.	Total strength.	155 pupils.

GOVERNMENT VERNACULAR SCHOOLS FOR GIRLS.

No. of L. G. Schools.	2.	No. of girls.	356.

ENGLISH SCHOOLS.

L. G. English School, Punalur, (Unrecognised).	1st Form.	32 boys.	4 girls.

INDUSTRIAL SCHOOLS.

There are no industrial schools in the taluk.

Natural products and their present utilisation.

Paddy.—The total land under paddy cultivation is 10,503 acres, the major portion of which is double cropped. This industry is the main stay of the people. The paddy grown is exported after the local demands are met with. There are facilities for producing increased amount of paddy, by intensive cultivation and proper manuring.

Tapioca.—Tapioca is cultivated in many parts of the taluk. It is grown in quantity for export purposes. This is the chief foodstuff of the lower class person. Recently Tapioca planting on a proper and large scale has begun. It is proposed to open a flour factory here in the immediate future and arrangements are being made now.

Arrowroot.—Arrowroot grows wild in the taluk and is not at present utilised for any purpose. The making of arrowroot flour could be introduced.

Fruits.—Pineapple, Plantains, Jack and mangoes are found in quantity in the taluk. The question of proper fruit cultivation was taken up here some years ago and a pineapple garden on a large scale was begun. Kew pines were introduced and flourished and today it is possible to get large fruit

up to 11 and 14 lbs. weight in the district. The project thrived and did well. The garden, however, of late has not developed much. There is ample scope for the fruit growing and preserving industry in Punalur district. The fruit grows well and is cheap, and if a proper tinning and preserving factory was established this would be a most favourable site. Fuel is cheap and the hilly nature of the country enables all kinds of fruit to be grown suited to particular climates. The fruit preserving industry is a most important possibility in this taluk.

Cocoanut.—It is estimated that there are sixty-five thousand cocoanut trees in the taluk. The area under cocoanut is small and there are few big topes in existence. The cocoanut produced is consumed locally for food and oil. At the present time little or no use is made of the husks. If small coir extractors are introduced in the taluk, the fibre industry could be developed a great deal, but the limitations of nature in the matter are the great trouble.

Arecanut.—Nearly two lakhs of arecanut trees are found in the taluk but the nuts are mainly used for local purposes. A few people are engaged in making "prepared arecanut" for export purposes and this is carried on by rail both to Quilon and Tinnevely District.

Bamboos.—Large quantities of Aeta and bamboo are found in the district. The main use made of the material in the taluk is for paper manufacture. Some of it is used locally for basket making and mat-weaving. This matter is now the subject of a separate enquiry by Government.

Trees and Timber.—*Oil bearing trees*—Marovottie and Pinnay are found in quantity in the taluk and the seeds are collected and pressed for oil.

Timber.—The greater part of this taluk is hilly and forest land. Most of the forest trees used for timber are found in the taluk. The existence of railway facilities has opened out these forests and much valuable timber is now taken out annually for export and used locally.

Rattan.—Amongst the minor forest products found largely in the taluk is rattan. The material is at present cut and used elsewhere but there is no reason why a cottage industry of rattan work cannot be started here. A depot for training workers and collection of goods, etc., as outlined in our special report is what is necessary.

Tea.—The hilly country here has been found highly suitable for the cultivation. Estates covering about 1000 acres are found here. The tea produced is manufactured on the estates and sent by rail to Quilon, whence it proceeds to Cochin for export. Some of it goes to Tuticorin.

Rubber.—Many estates devoted to rubber cultivation are found in the taluk. The Malayalâm Rubber Produce Co., Ltd., is the largest producer. The area under rubber is 2110 acres. Large tracts are still available and recently Indian Companies have been found locally to open out these areas. Pepper cultivation is also being undertaken by them. The rubber is chiefly exported *via* Cochin.

Minerals.

The mineral wealth of the forest regions is largely uninvestigated yet but the following minerals have been found.

Graphite is found near the town of Pattanapuram, at Avaneeswaram, and near Nileswaram. The exact quantity and quality have not yet been fully investigated.

Mica.—Mica is found in quantity about 5 miles from Punalur station and one mile from Chaleakara. The deposit is a good one and is of considerable value. Messrs. Christian and Co., are now opening out the work.

Existing and possible industries.

Agriculture.—This is the main occupation of the people. There are 10,503 acres under paddy cultivation of which the major portion is double cropped. This industry engages more than 15,000 people. The number of big land-owners is small, being estimated at less than ten. The average income of these persons is more than Rs. 10,000 a year. The majority of the people are poor and are dependent upon the land-lords. The average income of an agricultural labourer is about 6 As. a day. The high rate is mainly due to the demand for coolies to the rubber and tea estates where the coolies get more than 8 As. a day on the average. Some hundreds of people are working in the tea and rubber estates and are generally drawn from the poorest classes. The cost of living of an agricultural labourer and his family can be estimated at Rs. 15 a month. Generally this is made up by the cultivation of tapioca and other yams in the compounds. The growing of tapioca is carried on as an industry subsidiary to paddy cultivation and in the majority of cases, the

same people are engaged in it during the days when there is no work in the fields.

Tapioca.—At the present time tapioca is dried and exported. Some people are engaged in the preparation of flour but this is mainly carried on, in a small scale as a cottage industry, only local and household demands are now met and these are only little. There is scope for increased production of the raw tapioca and probably waste areas could be devoted to the cultivation. Near Punalur is an ideal site for a tapioca factory. Good water and sloping ground exist so that gravitation can be used for the flow of liquid from one machine to the next. Plentiful fuel supply and water-power are at hand. The site is excellent and it only requires the necessary local growth of the root to ensure a successful industry. The flour so produced is a valuable "Size" for paper and could probably be used in the local mills. This year some 150 acres are being planted for this purpose and if successful a factory is to be established. The success of the project is assured if proper methods are employed.

The Punalur Paper Mills.—The "Travancore paper Mills Company" was started by the 1st December 1887, with a limited capital of 3 lakhs to be raised by 600 shares of Rs. 500 each, of which more than 400 shares were allotted in the company. It was formally registered on the 14th April 1888 under the Joint-stock company's Act. The Government entered into a formal agreement with Mr. Cameron, the promoter of the company, by which the Government guaranteed to pay interest to the share-holders on their capital for a period of 15 years at 4% per annum, from the date of the registration of the company. The Government also took 50 shares in the company. The management was vested in Messrs. Cameron and Chisholm & Co., Quilon, who were subject to the control of the Directors of the company. One of the directors was called the Government Director, who checked all statements and accounts before they were submitted to Government. Mr. Rhode, Commercial Agent, Alleppey, was the first Government Director.

The mill was located at Punalur and was worked by water power by the construction of a dam across the Kallada River. By July 1889 the dam and the buildings were completed and the machinery arrived from England.

The original capital was found insufficient and the company applied for a loan of $1\frac{1}{2}$ lakhs from Government. The Government decided to give the loan at 8% per annum on the security of the mill and its properties. The mill started work on the 15th November 1890. The estimate of the capital of $4\frac{1}{2}$ lakhs of rupees was found inadequate and the company asked for half a lakh of rupees more as loan from Government as working capital. The Government advanced a further sum of Rs. 25,000. The company experienced great difficulty for want of funds to meet the cost of chemicals and labour and asked for a further loan of Rs. 63,000 which was accordingly paid in two instalments.

During the first year the total quantity of paper manufactured was $178\frac{1}{2}$ tons and the cost price per ton was Rs. 395—As. 8 while the sale price was only Rs. 258 per ton, thus resulting in a loss of Rs. 137—As. 8 per ton. The total loss amounted to Rs. 23,716 and adding to this amount the interest due on the loan the company sustained a loss of Rs. 38,304 during the official year. The loss was attributed to several causes, the chief of which was deficient steam and boiling power for running the machine and treating the "Aeta" and other materials used and the small out-put resulting therefrom.

The company pressed for funds again and the Government made a further advance of Rs. 20,000 on the security of the manufactured article. This being found insufficient to meet the demands of the company, a further loan was applied for. After making enquiries regarding the working of the company, the Government wanted to modify the original agreement. This was not acceptable to the share-holders. The accounts of profit and loss, of the company for the official year ending 30th September 1893 showed that the company had been working at a loss. On the 30th March 1893 the mill stopped working. Expert advice was obtained for working the mill, and it was found that the mill was not suitable for the manufacture of white paper and that the mill might be re-started for the manufacture of brown paper under certain conditions, the chief of which was that the mills should work day and night for at least five days in a week for the manufacture of even brown paper at a profit. As no large markets were found for brown paper, the idea of manufacturing brown paper was given up.

The Government purchased the property in auction. In 1903, Messrs. Valliabhoj Kadirbhoj and Co., purchased the mill and all its properties for Rs. 32,005 from the Government. The mill was not worked for a long time and then after a period of idleness the business was revived by the Department of Industries, Madras. In 1916 the department ceased its work and handed the mill over to the Meenakshi Paper Mills Co., the present owners, under the management of Mr. Narasinha Iyer. This firm have made packing and brown paper, using bamboo and reeds for their pulp. The power is derived from turbines working by water power from the river, and also steam power. The out-put has been steady and good profits have been made. From 100 H. P. to 300 H. P. can be obtained by the water power according to the state of the River. The factory employs about 100 workmen. The market for the goods is at present excellent and the quality of the paper is also very good. The whole question of paper manufacture is to be the subject of a separate investigation and report.

Match Making.—The district round Punalur and Tenmalai is the most suitable site for a match factory as the neighbouring forests abound in soft woods. The matter has already been taken up by "the South India Match Factory Co., Ltd.," an Indian company and the foundations of the factory are laid at Tenmalai. The war caused difficulties in obtaining suitable machinery, but now the Directors are moving again and it is hoped that their efforts will be successful at an early date. The capital is subscribed for the project and the site chosen is highly suitable.

Agricultural Implements.—There are about 75 carpenters and about 30 families of blacksmiths. They make the local implements for agriculture and do the general work of estates, etc.

Foodstuffs used and available locally.—Rice, tapioca, peas, plantains, jack, mango and cocoanut. Fish is also an important article of food.

Economic statistics.

In all there are about 23,000 skilled workmen in the taluk including the agriculturalists. The artisans engaged in different crafts are set out as follows :—

Carpenters.	75	8 to 10 As. a day.
Masons.	75	6 to 10 As. a day.
Blacksmiths.	30 families	Contract work, earns 12 As. a day.
Coolies,	Some hundred	Earns 4 As. a day to 6 As.

Cost of living.—Cultivator's family Rs. 15 a month on an average.

Cooly's family. Rs. 5 a month.

Single person (Middle Class) Rs. 7 a month. ...

No. in a family. Cultivator's family. Five persons.

Cooly's family. Three to four persons.

No. of Voters—8.

Co-operation.

No co-operative societies are in existence in the taluk.

Joint-stock companies.

There are no Joint-stock Companies existing in the taluk.

Capital and remarks.

The chief wealth of this taluk lies in its uncultivated land. Some hundreds of acres of fallow land could be made to grow tapioca. Already an awakening is evident in the district and both European and Indian residents are taking up the matter at our suggestion. One hundred and fifty acres of tapioca land are to be brought under cultivation and if the yield is good a tapioca flour factory will be started. The capital available locally is not great, but if a good industry is demonstrated there will be plenty to support it. Rubber cultivation is also extending in the taluk. For tapioca the capital is already promised.

KOTTARAKARA TALUK.

Area,—202·03 sq. miles.	Population,—90,310 persons.
	No. of houses. 17,281.
No. of pakuthies,—9.	Taluk town.—Kottarakara.

Location.

Division.—This taluk occupies the southern portion of Quilon Division.

Boundaries.—*North*—Kunnathur and Pattanapuram taluks. The Kallada river divides this taluk from Kunnathur.

South—Chirayinkil and Nedumangad taluks.

East—Pattanapuram taluk. The Ittikara Aur divides a portion of Pattanapuram from Kottarakara.

West—Quilon taluk.

Railway.—The Quilon—Shencottah Railway passes through the northern portion of the taluk. The only Railway station in the taluk is Kottarakara and all articles of export are taken to this station by cart-load.

Backwaters and Rivers.—This taluk lies inland and is not washed by backwater. A portion of the Ashtamudi lake extends within a few miles of the taluk near Kallada and near Kundra. The Kallada river forms the northern boundary of the taluk, separating it from Kunnathur and is navigable for some miles. The Ittikara Aur flows in the south of the taluk dividing it from Pattanapuram and Chirayinkil. It is not navigable for vallams.

Main Roads and village roads.—The main central road passes from south to north leaving the taluk near Kulakada. This road passes through Chadayamangalam, Ummanur, Vettikavila, Kottarakara and Kulakada pakuthies, affording facilities for communication to them. From Nilamel in the south of the taluk a branch of the main central road runs east to Madathirakani and thence it turns north to Tenmalai. Another road runs to Paravur. A road goes north from Velianallur to Kottarakara. These are the important roads. Other village roads are in existence and are generally cartable.

Seaport.—The nearest seaport is Quilon and is $16\frac{1}{2}$ miles distant from Kottarakara of which 16 miles are by railway.

Cultivation.

Wet land area.—21,094 acres. Dry land area.—65,175 acres.
Unregistered land.—44,925 acres.

Pakuthies.

Name of pakuthy.	Area.	Population.	Wet land.	Dry land.
	sq. miles.	persons.	acres.	acres.
Ezhukone ...	24.70	16920	6009	9981
Kottarakara ...	15.48	12610	1578	6822
Veliyam ...	20.26	10720	3020	6734
Ummannur ...	23.29	6470	1418	2603
Velinallur ...	22.16	7550	1421	6660
Chadayamangalam.	32.69	9410	2239	8298
Kulakkada ..	11.28	8070	1240	5056
Kummil ...	41.07	8060	1893	14846
Vettikkavila ...	13.95	5420	1352	4876
Melila ...	7.15	5070	928	3153

Education.

GOVERNMENT VERNACULAR SCHOOLS.

No. of H. G. Schools, 4. 1394 boys. 117 girls.
No. of L. G. Schools, 16. 2129. ... 412 ...

AIDED SCHOOLS.

No. of L. G. Schools, 31. 1841 boys. 565 girls.

UNAIDED SCHOOLS.

No. of Schools, 8. Total No. of pupils 272.

GOVERNMENT VERNACULAR SCHOOLS FOR GIRLS.

No. of H. G. School, 1. 284 girls.
No. of L. G. School, 1. 89 „

AIDED.

No. of L. G. Schools, 2. 62 girls.

ENGLISH SCHOOLS.

Incomplete H. G. School, 4 Forms. 250 boys. 20 girls.
Kottarakara.

INDUSTRIAL SCHOOLS.

There is one weaving school in the taluk which is newly opened.

Natural Products and their Present Utilisation.

Paddy.—This is the main product of cultivation in the Taluk. The total area under paddy cultivation is 21094 acres, of which 95% is double cropped. The quantity of paddy grown in the taluk is large and it is exported to the neighbouring taluks. There is no husking mill, and paddy is husked by local people in their own homes.

Tapioca.—Tapioca is cultivated fairly largely in all parts of the taluks. It is an important article of food among the low class people. A large quantity of it is consumed locally but dried tapioca is also exported to Quilon and other places. There is much scope for increasing the output as there are many acres, where nothing is grown at present, suitable for this cultivation.

Cocoanut.—More than 2 lakhs of cocoanut trees are found in the taluk. They are generally cultivated on the banks of the rivers and streams and on the valleys of some of the hills—Vellam, Kummil and Vettikkavala are the pakuthies where the cultivation is large. Very little of copra making is carried on in the taluk. Most of the cocoanuts are consumed in the locality. The husks are either neglected or burned for fuel. Coir industry does not exist in the taluk for want of soaking facilities.

Pepper.—Plantations of pepper vine are found in many parts of the taluk. Large quantities of pepper are exported. Cultivation of the vine can be increased as there are many places where this could be grown with success.

Arrow root.—It is grown wild in the taluk but little care is taken of the material and is neglected. If proper cultivation is carried on this material could be made to bring a good income. In a factory, arrow-root also can be converted into flour and it would fetch a good price. The industry needs more attention.

Sugar-cane.—Sugar cane is grown along the banks of the rivers but large plantations are not found. In Malila,

Vettikkavala pakuthies, small plantations are found. Little use is made of the material in the taluk except for jaggery.

Other products.—Arecanuts, pine-apples, plantains, peas, yams and other things are also grown in the taluk. With increased cultivation plantain and pine-apple fibre industries can be introduced on a cottage basis in the taluk.

Trees and Timber.—Since the taluk is hilly there are many trees and timber available. Among the oil-bearing trees can be mentioned Pinnay and Maravottie and the seeds are pressed in the local presses and the oil is sold for burning purposes. Teak, Thempavoo, jack and mango are among the timber trees. Bamboos and rattans are also found in quantity in the forests.

Minerals.

Clay for pottery exists in quantity in many parts of the taluk.

Existing & possible industries.

Agriculture.—This is the main industry of the taluk. Paddy cultivation is the most important. There are 21,094 acres of paddy land and almost all of which is double cropped. More than 20,000 people are engaged in the paddy fields. The average wages of an agricultural worker are four annas a day. This is barely sufficient for a family but in the majority of cases both the men and women work in the fields and by their wages, a family is maintained. There are about 90 land lords in the taluk; their average income is Rs. 2,000 in a year. Pepper cultivation is another industry for the people but in this case only little attention need be paid. Tapioca cultivation is generally carried on by the people during the periods when there is little work in the paddy fields. In some cases, this adds to the income of the family.

The agricultural implements are made by local carpenters and blacksmiths. There are 187 carpenters and 30 to 40 families of blacksmiths in the taluk. The average income of the carpenter is 8 As. a day and that of the smith is 12 As. The implements used are old-fashioned and are easily made by the artisans. Owing to cheapness of imported goods, only repairs are done by the local blacksmiths. The Department of Agriculture has established a well-run cattle farm here, sheep for wool have been introduced from Coimbatore and other good animals are also kept.

Cocoonut Industries.—Copra making is carried on a small scale in Kulakada pakuthy. The copra made is pressed for oil in bullock-driven presses locally and the oil consumed in the taluk. There are only a few presses.

Tapioca flour.—Tapioca flour is made in small quantity as a cottage industry. The flour is used locally but a small quantity is exported to Quilon. This industry will thrive well if a factory is established. Increased cultivation of tapioca is possible.

Gunny Bags.—Gunny bags are made by a few persons in Kottarakara pakuthy. The raw material, hemp, is imported from Shencottah and is manufactured into sack cloth. The manufactured articles are exported to Tinnevely and other places.

Weaving.—There are less than 20 isolated weavers in the taluk each working individually and with their own looms in their cottages. Recently a weaving school has been started in the taluk. The yarn is purchased from Quilon and the weavers supply purely local needs. The monthly earnings are about Rs. 7 and the expenditure about balances.

Basket making & Rattan work.—The raw materials, bamboo and rattan are obtained in quantity from the forests of the taluk and these industries can be begun with advantage as a cottage industry.

Pottery and tiles.—Clay suitable for pottery and tiles is found in large quantity in the taluk. The establishment of a factory for the purpose will be advantageous in the taluk. There is no lack of firewood.

Soap manufacture.—A small soap factory called the "Sadananda Soap Works" is established at Thettiyodu, five miles distant from Kottarakara. The factory is equipped with one boiling pan, two settling vats, made of wood, and provided with detachable sides, and a stamping machine worked by hand. A trained man is in charge of the factory (the trained hand is not a full-time workman as he is also a teacher in a school.) Only medicinal soaps are made in the factory and they are packed in card-board boxes, with labels printed on them. The alkali used was originally the crude alkaline earth from Madura but subsequently caustic soda was substituted.

The labels and pamphlets for advertisement are printed in their own printing press. Three persons are engaged in the press.

Hosiery & Woollen Goods.—Mr. Ganapathy Iyer has begun a small business for the manufacture of socks & hosiery by machinery. He has already obtained orders, but the work is in its infancy. This is a cottage industry capable of extension here if properly organised.

Sericulture.—There is a project to open out a sericulture farm here under the auspices of the Salvation Army. The chances of success for mulberry cultivation are excellent and this is a cottage industry which will undoubtedly flourish in this taluk.

Foodstuffs used and available locally.—Rice, tapioca, yams, peas, juck, mangoes. Fish is an important article of food.

Economic Statistics.

Including agricultural labourers there are more than 25,000 persons engaged in various vocations:—

Carpenters	187	8 to 10 As. a day.
Masons	67	6 to 10 As. a day.
Blacksmiths	30-40 families	12 As. a day. Usually contract work.
Coolies	Some thousands	6 Chs. a day on an average.

Cost of living.—

Cultivator's family	Rs. 20 to Rs. 25 a month.
Cooly's family	Rs. 5 to Rs. 6 a month.
Single person	Rs. 7 a month.

Number in family.—

Cultivator's family	Five to six persons.
Cooly's family	Four persons.
No. of Voters	95.
No. of Professional men	300.

Co-Operation.

No co-operative societies are in existence in the taluk.

Joint Stock Companies.

There are no Joint Stock Companies registered in the taluk.

Capital and Remarks.

The taluk contains several rich men who could well invest in industrial concerns. They however have landed property and good security and are not tempted to encourage indigenous enterprise. The Button Factory was removed from here due to lack of support and the same thing applies to the soap factory. The public are reticent to invest industrially. The chief industry here is agriculture and the development and increase of production is a matter for careful consideration. Tapioca for example, could be more abundantly grown and possibly a flour factory could be supported in the neighbourhood.

VILAVANCODE TALUK.

Area,—137.00 sq. miles.	Population,—91,030.
No. of houses,—15,977.	No. of voters,—59.
No. of pakuthies,—13.	Taluk town,—Kuzhithurai.

Location.

Division.—This taluk occupies the northern portion of the Padmanabhapuram Division.

Boundaries.—NORTH.—Neyyattinkara taluk.

SOUTH.—The Arabian Sea and Eraniel taluk.

EAST.—Kalkulam taluk. The Thambraparni River divides it from Vilavancode.

WEST.—The Arabian Sea and Neyyattinkara taluk.

Backwaters and rivers.—The southern portion of the taluk is bounded by the sea. The coast line extends over $7\frac{1}{2}$ miles. There are no backwaters and lakes in the taluk. The only river of any importance is the Thambraparni. It divides this taluk from Kalkulam and takes a bend to the north-west and joins the sea near Tengapattanam. It is not navigable.

Main roads and village roads.—The main central road passes through the taluk near Kuzhithurai. A branch of this road goes to Tengapattanam. From Kuzhithurai, one road

passes through Arumana to Triparappu. These roads are cartable and are in good condition. The village roads are in good condition in most cases and afford good means of transport.

Nearest seaport.—The nearest seaport is Colachel and is $11\frac{3}{4}$ miles distant from Kuzhithurai. It is reached entirely by road.

Cultivation.

Wet land area,—5257 acres. Dry land area,—35,333 acres.
Cocoanut land area,—7,178 acres. Unregistered land,—5,034 acres. Uncultivated land area,—6951 acres.

Pakuthies.

Name of pakuthy.	Area.	Wet land area.	Dry land area.	Unregistered land.
	Sq. miles.	Acres.	Acres	Acres.
Arumana ...	11.61	Total 5,257 acres.	Total 35,333 acres.	Total 5,034 acres.
Arudesapattu ...	3.35			
Medukkummal ...	7.46			
Eshudesapattu ...	4.54			
Kollankodu ...	4.91			
Kalial ...	67.18			
Kunnattar ...	3.72			
Nallur ...	8.60			
Idakodu ...	8.76			
Pakodu ...	5.40			
Painkulam ...	3.53			
Palukal ...	4.13			
Viluvancode ...	5.03			

Education.

GOVERNMENT VERNACULAR SCHOOLS.

No. of H. G. Schools, 3. 1386 boys.
32 girls.
No. of L. G. Schools, 10. 1070 boys.
379 girls.

AIDED.

No. of L. G. Schools, 32. 2273 boys.
501 girls.

UNAIDED.

No. of Schools, 20. Total number of pupils, 746.

GOVERNMENT VERNACULAR SCHOOLS FOR GIRLS.

No. of H. G. School, 1. 498 girls.
No. of L. G. Schools, 4. 382 „

AIDED.

No. of H. G. School,	1.	235 girls.
No. of L. G. Schools,	3.	138 „

ENGLISH SCHOOLS.

Government L. G. School, Marthandam, 3 forms 208 boys,
11 girls.

There are no Girls' English Schools in the taluk.

INDUSTRIAL SCHOOLS.

There are no industrial schools in existence in the taluk but a school for brush-making would be of the greatest advantage here.

Natural Products & their present utilisation.

Paddy.—There are about 5257 acres of paddy land in the taluk and all of them are double cropped. The major portion of the taluk is forest land and therefore the production of paddy is small compared with the total area. The local paddy produced is not sufficient for the local consumption and paddy has to be imported from Tinnevely and other places. Kalliyal pakuthy grows the largest amount of paddy due to the help rendered by the irrigation works.

Tapioca.—The major portion of the dry land of this taluk is suitable for tapioca cultivation. Large plantations are found. This is the chief foodstuff of the low class people, but much of it used to be exported in the dry state to other taluks. If increased cultivation is taken up, a small factory can be started for the production of tapioca flour, near the river side at Kuzhithurai, which is quite a suitable site.

Cocoanuts.—About 7,180 acres of land grow cocoanut in the taluk and nearly 3 lakhs of trees are planted thereon. Large plantations are in existence in Arudesapattu, Medakummal, Ezhudesapattu and Kollankodu. The cocoanut is mostly used locally for oil and other purposes. The husks are not made use of except for firewood for want of soaking facilities, except on the seashore where pits are dug and coir is extracted in the usual way for export.

Palmyra.—Next to Eraniel, this taluk is the greatest palmyra producing area. There are more than 4,85,000 palmyra trees now growing. The chief uses made of this tree are for toddy manufacture, jaggery making and fibre extraction. Although these industries are successful in the taluk,

fresh plantations are not undertaken. This is mainly due to the poverty of the people. There is a scarcity of climbers in the taluk and only 25% of them are tapped annually for toddy and fibre. A tree is generally mature for tapping when it attains 50 feet in height. An average climber can climb upon 50 trees a day for purposes of fibres, etc., but only 25 trees can be tapped by him in a single day. A small quantity of the fibre is extracted and sold to the firms in Colachel but want of soaking facilities is a great impediment to the use of the palmyra fronds for fibre, as is the case with cocoanut. The report on Eraniel taluk has dealt fully with this question.

Fruits.—Plantains, pine-apples, mangoes, guavas, jacks are all found very largely in this taluk and some of them are exported to the neighbouring taluks. They are consumed by the people and no attempt has yet been made at fruit preserving. This industry needs development.

Trees and timber.—*Oil bearing trees.*—Pinnay, iluppa, maravottie are the important among them. The seeds are collected locally and pressed for oil. The oil is mainly used locally for the purpose of burning.

Other trees.—Puvam, tamarind, cashew-nut and forest trees are also found in quantity. Sappan-wood is found in small quantities near Kuzhithurai.

Cereals, &c.—Peas, grams, thena, chama are also cultivated in small quantities.

Minerals.

Mica.—Mica is found in the north-west of Puducaday village. It is of the phlogopite variety and is found in hexagonal books. The quantity seems to be large.

Graphite.—Graphite is found near Palliyadi at a depth of 60 ft. The quantity seems to be large and the quality is good. Mining was formerly carried on in the taluk by Messrs. Parry & Co., Ltd.

Clay.—Good clay exists in quantity in the taluk, useful for pottery and tiles.

Existing and possible Industries.

Agriculture.—This is the main occupation of the people. Paddy cultivation, tapioca growing and cocoanut plantations are among the important industries connected with agriculture. Over 25,000 people are engaged in the industry.

The number of landlords is small in this taluk, being estimated at about 40. The average earning of a landlord is between Rs. 2,000 to Rs. 5,000 a year. The cultivator's income may be estimated at Rs. 400 a year on an average and this is only sufficient for his daily expenditure. The agricultural labourer earns from 7 Chs. to 8 Chs. a day for his work in the fields and he maintains himself with this amount in absolute poverty. In many cases he lives in his own compound where he cultivates tapioca and other yams during his leisure hours and thus he maintains himself. The women folk also make palmyra mats and lace thus adding to the family income. Cultivation of tapioca, palmyra and coconut can be extended in this taluk. This would find regular work for more people.

Palmyra industries.—The possibilities of these industries have been already discussed in Eraniel report. The total number of trees tapped for toddy in this taluk in 1092 was 1181. The toddy is mainly sold locally. A large number of trees is tapped for sweet toddy and jaggery is manufactured and exported. A sugar mill in this taluk or in Eraniel would be advantageous.

Palmyra fibre Industry.—This is carried on a fairly large extent in the taluk. It is sold to agents in the locality, who sell it to the European firm in Colachel for dyeing and export. Brushes, etc., are manufactured from the fibre in Europe.

Jaggery.—A large number of trees are tapped for sweet toddy and the preparation of jaggery. It is done by the people as a cottage industry and jaggery is exported by agents to feed Parry & Co.'s sugar factory.

The establishment of a local sugar factory will be of immense benefit to Travancore as already suggested in Eraniel Report.

Mat-making.—Palmyra mats are made in large quantity in the taluk. It is carried on as a cottage industry and large export trade is carried on. The mats are mainly used for packing purposes. Rupees three to four per mensem is the average income of a worker from this source.

Match-box-making.—The making of match boxes out of palmyra leaves can be introduced as cottage industry in South Travancore. For the purpose of organising it a factory could be established, designs and sizes of the boxes and

the method of making them taught to the people. These boxes can be collected at the factory and the finishing part done in the factory.

Brush-making.—Brush-making can be introduced both on the cottage and factory scale.

Weaving.—Weaving is carried on as a cottage industry by about 1000 people in this taluk. The important weaving centres are Unnavilakkadai, Nattalam and Palliyar. There are about 100 weavers in Palliyar alone. The average earning of a weaver is Rs. 8 to Rs. 15 a month. Besides the commoner articles, lace cloth and nariethus are all manufactured in the taluk. The articles are sold locally but large orders from Cochin and other taluks in the State are also executed. There is a decline in this industry owing to the poverty of the weavers and it needs organisation and a depot to assist with yarn supplies. A large number of the weavers are Mohamedans. The various notes on weaving in Agasteswaram taluk are appropriate here also.

Cocoanut Industries.—Although there are large number of cocoanut palms in existence in the taluk, cocoanut industries are not greatly developed. Copra making, oil pressing are carried on a small extent, but only local needs are supplied. Coir industry is not carried on to any great extent in the taluk for want of soaking facilities. It is carried on a small scale in Ezhudesapattu pakuthy.

Lime-burning.—Along the coast the collection of lime shells and the burning of the shells for lime employs a number of people. (See Eraniel taluk).

Embroidery.—There are large number of persons engaged in lace and embroidery in Palukal and Ezhudesapattu. They are instructed and directed by the various Missionary Institutions. The articles manufactured are sold to the mission agencies. In all cases, the raw materials and patterns are supplied by the mission. The L. M. S. under Mrs. Hacker is particularly active in this locality.

Carpentry and Smithery.—There are 294 carpenters and about 40 smiths. Their main work is in the construction of houses and household articles and of agricultural implements.

Fishing.—Some thousands of fishermen are found on the coast. They supply the locality with fish and other

articles such as shells. The products are sold in the locality and also to the fishcuring yards.

Food-stuffs used and available locally.—Rice, tapioca, cocoanut, jaggery, yams, peas and other articles. Fish is an important article of food.

Economic statistics.

More than 35,000 persons are engaged in different crafts, of whom about 25,000 are agriculturalists. The skilled workmen are set out as follows :—

Carpenters.	294.	6 As. to 10 As. a day.
Masons.	295.	6 As. to 9 As. a day.
Blacksmiths.	about 40.	8 As. a day on an average.
Weavers.	some 1000.	5 As. to 8 As. a day.
Toddy drawers.	some 100.	6 Chs. to 10 Chs. a day.
Mat weavers.	some 1000.	8 Chs. to 10 Chs. a day.
Coolies.	some 1000.	4 As. a day.
<i>Cost of living.</i> Cultivator's family.	Rs. 20 to Rs. 30	a month.
Cooly's family.	Rs. 7 to Rs. 8	a month.
Single (middle class) person.	Rs. 8 to Rs. 12	a month.
<i>Number in family.</i> Cultivator's family.	5 to 6 persons.	
Cooly's family.	3 to 4 persons.	

Co-Operation.

There are no co-operative societies in existence in this taluk.

Joint Stock Companies.

There are no joint stock companies existing in this taluk.

Capital and remarks.

The taluk is mainly agricultural. Palmyra industries and Brush making are the chief point on which Industrial enterprise can be concentrated. Capital is not available in large sums, but for cottage industries a co-operative depot would thrive.

KALKULAM TALUK.

Area,	169 Sq. miles.	Population,	74,210.
No. of houses,	16,900.	No. of voters,	143.
No. of pakuthies,	11.	Taluk town,	Padmanabhapuram.

Location.

Division.—This taluk is situated in the middle portion of the northern taluks of Padmanabhapuram Division.

Boundaries.—NORTH.—Tinnevely District

SOUTH.—Eraniel Taluk,

EAST.—Thovala Taluk.

WEST.—Vilavancode Taluk.

The Kothayar River divides Vilavancode Taluk from the Kalkulam Taluk.

Railway.—No railway touches this taluk. The nearest railway station is Trivandrum, which is $32\frac{3}{4}$ miles away. A major portion of exports and imports is, however, carried to Tinnevely *via* Nagercoil by cartload.

Backwaters and rivers.—This taluk lies inland and is not touched by backwaters. The Tamravarni River rises from the northern slopes of Mahandaragiri and flows south-eastward through Kalkulam and Vilavancode taluks and falls into the sea near Tengapattanam. Kothayar is its tributary and it rises from the slopes of the Muthukuzhivayal on the top of Muttachimalai and forms the boundary between Vilavancode and Kalkulam. The Kothayar River joins the Tamravarni near Thiruvattar. There is a small fall near Triparappu called Bhadrakali falls; near Aruvikara there is another small waterfall. The water traffic in the taluk is nil.

Main roads and village roads.—The main central road passes through the taluk in the south and is the important road for communication. A branch of this road leads up to Thiruvattar, Kulasekaram and Petchipara Dam. Another branch goes up to Thadikarakonam and Bhuthapandy and joins the main central road at Nagercoil making a big curve. From Bhuthapandy, another road runs to Aramboly and to Tinnevely. Many other cartable roads are found in the taluk and are in good condition. Since road traffic is the only means of transport it is highly important that the condition of the roads is good. Motor Bus services from Trivandrum to Nagercoil pass daily through the taluk along the main central road.

Nearest seaport.—Colachel is the nearest seaport town and is $8\frac{1}{2}$ miles from Padmanabhapuram. There are several good cartable roads from here to Colachel. Thus shipping facilities are good.

Cultivation.

Wet land area, 8,253 acres. Dry land area, 41,700 acres. Unregistered land, 5,024 acres. Coconut land, 2,561 acres.

Pakuthies.

Name of pakuthy.	Area.	Population.	Wet land.	Dry land.	Coconut land.
Attur ...	8.55 sq. miles.	4,950 persons.	740 acres.	4475 acres.	750 acres.
Kalkulam ...	6.55 sq. miles.	8,120 persons.	1738 acres.	1807 acres.	70 acres.
Thackalay ...	5.09 sq. miles.	11,220 persons.	757 acres.	2162 acres.	120 acres.
Kappiyara ...	4.12 sq. miles.	4,570 persons.	483 acres.	1960 acres.	17 acres.
Valvachathottam ...	5.58 sq. miles.	5,850 persons.	643 acres.	2673 acres.	20 acres.
Kothanallur ...	12.50 sq. miles.	6,860 persons.	1914 acres.	5511 acres.	150 acres.
Mekkodu ...	7.01 sq. miles.	5,230 persons.	571 acres.	3467 acres.	55 acres.
Poumava ...	14.33 sq. miles.	4,130 persons.	1108 acres.	9611 acres.	334 acres.
Aruvikara ...	4.13 sq. miles.	8,140 persons.	315 acres.	1963 acres.	114 acres.
Thiruvattar ...	6.06 sq. miles.	11,250 persons.	540 acres.	3095 acres.	630 acres.
Triparappu ...	11.10 sq. miles.	4,100 persons.	857 acres.	4975 acres.	220 acres.

Education.

GOVERNMENT VERNACULAR SCHOOLS.

No. of H. G. Schools, 3. 1386 boys. 40 girls.
No. of L. G. Schools, 10. 1070 „ 379 „

AIDED.

No. of H. G. Schools, 1. 159 boys. 33 girls.
No. of L. G. Schools, 25. 1625 boys. 575 girls.

UNAIDED.

No. of Schools, 12. No. of pupils, 364.

GIRLS' VERNACULAR SCHOOLS.

No. of Government H. G. Schools, 2. No. of girls. 479.
No. of Government L. G. Schools, 1. „ 118.

ENGLISH SCHOOL FOR BOYS.

Government L. G. E. School, Thackalay. 3 Forms. 208 boys.
11 girls.

There is no English school for girls in the taluk.

INDUSTRIAL SCHOOLS.

No industrial schools are in existence in this taluk.

Natural Products and their present utilisation.

Paddy.—There are 8,253 acres of paddy land all of which are cultivated. Two crops are taken every year from almost all of it. Of the pakuthies, Kalkulam, Ponmana, and Kothanalloor have largest area under paddy. The Kothayar Project has turned much of the former dry land into paddy land. The quantity of paddy grown is fairly great and this area supplies a large local area with grain. The channels of the irrigation scheme have done much to open out and fertilise the country side here.

Tapioca.—Next to paddy, tapioca is the important food-stuff of the people. It is cultivated in all parts of the taluk but the largest quantity produced is in Attur. The local product is carried by head load and cart-load to the markets of Pettai and Kappakada to the Monday Market, and to that of Thuckalay. The price of tapioca in the locality is half a rupee per thulam of 20 lbs. Tapioca grown in the taluk is sufficient for local consumption but there is great possibility of growing it on a large scale. Among the important local markets for this commodity may also be mentioned those of Kulasekharam, Kesavapuram, Karingal and Vadassery. It should be possible to establish a tapioca flour mill at some convenient centre so that the whole of the local area could be cultivated and a steady demand kept up.

Cocoanuts.—The total area under coconut cultivation is estimated at 2561 acres and more than one and half lakhs of trees are growing. Ponmana, Thiruvarpur and Kalkulam contain the largest area under coconut cultivation. The coconut is cut and made into copra and is used in the local mills for oil. This taluk is not a great coconut producing area. The price of coconut is Rs. 4 to Rs. 5 per hundred. The husks are generally used for fuel as there is little soaking facility. The coconut topes are almost all confined to the western portion of the taluk.

Arecanut.—In most cases arecanut trees are planted alongside coconut trees. More than one lakh of trees are growing at present in the taluk. The nuts are used locally but some of it is exported. The price of the nuts is Re. 1/6 per thousand on an average, but the price varies according to size.

Palmyra.—The Talipot palm is found in large numbers in this taluk. It is estimated that about 4 lakhs of trees are now growing. Owing to the Kothayar Project, palmyra

trees have been cut down and the land is converted into paddy land. Diminishing attention is now paid to the industry. The industries connected with the products of this tree have declined to a great extent. Bulletin No. 16 of this department deals fully with the question and also the detailed report for Eraniel Taluk to which reference can be made.

Plantains.—Plantains are grown fairly largely for the sake of the fruit. The products find a local sale. If a fruit preserving industry is opened in South Travancore, a stimulus will be given to the increased production of this plant. Fibre-extractors may be introduced in the taluk and the plantain fibre now wasted utilised profitably.

Pine-apple.—Pine apples are also grown largely in the taluk but at present it is grown only to supply the local demands. There is scope for increased cultivation and increased markets. The fibre of the leaf can also be utilised if fibre extracting machines are introduced. Other fruits are guavas, wood-apples, tamarind, etc., and are used locally. Tamarind is produced for export also. The total number of tamarind trees is about 30,000. Large quantities of tamarind are exported to Trivandrum and other places. The whole question of starting a fruit farm and preserving factory should be considered here most seriously. It is undoubtedly a most suitable place.

Rubber and Tea.—There are about six estates for growing tea and rubber in this taluk, all of which are working properly. Rubber and tea are exported to Europe and other places through Nagercoil and Tuticorin.

Trees and Timber, Oil Producing trees.—Pinnay, Iluppa, Poovam and Maravottie. These are grown for their oil seeds and also for firewood.

Other trees.—Njaval, anjili, cashewnut, puvarasu, blackwood, teak-wood, konna and vaka.

Minerals.

Mica deposits are found in Kappiyara pakuthy but their extent is not yet fully investigated. Traces of graphite have also been seen in many places.

Existing Industries.

Agriculture.—Agriculture is the main industry of the taluk. Paddy cultivation is the most important. The extent of the cultivation has been estimated at 8,253 acres and two

crops are gathered every year. This industry occupies about 30,000 people all the year. The average earning of an agricultural labourer is estimated at 6 Chs. a day. In most cases, the husband and wife work on the farms and earn 10 Chs. a day. This is sufficient for a family of 3 to 4 members. During their spare hours they cultivate tapioca and other yams in their compounds and an additional income is obtained from the sale of these. In the majority of cases, the garden produce is used up for their needs. Many of the agricultural workers find employment in the cultivation of tapioca and palmyra products. Food products such as chama, grams, peas are also cultivated in the locality by the agriculturalists.

Cocanut Industries.—Some hundreds of people are engaged in these industries. Among them oil pressing and copra making are alone carried on in this taluk. Both copra and oil are used locally for reasons already stated. This is only a small industry in the taluk.

Toddy drawing.—Toddy drawing is an industry among the Channars. About 100 people are engaged in this calling. The palmyra is tapped both for sweet toddy and fermented toddy. The trees tapped for sweet toddy are not taxed. Sweet toddy is boiled down and jaggery is made out of it. A large quantity of the material is sent to Nagercoil. This industry has been dealt with in detail in Bulletin-No. 16 of this department. The number of trees tapped for fermented toddy in 1092 was 914. This is the smallest number of any of the five taluks of Padmanabhapuram Division.

Weaving.—Cotton was cultivated in fairly large quantity in this taluk formerly and weavers then spun their own yarn. This industry has now almost died owing to the conversion of a large area of cotton growing land into wet land for paddy. Hand spinning also failed owing to the introduction of cheap yarn from power mills and the high cost of raw cotton as against yarn. There is a large weaving community in the taluk most of whom are Mohamedans. The total strength is over 100 families. They weave all kinds of cloth for local wear and also some of the finer varieties. All along the main central road these weavers are found working as a cottage industry. Many of them are skilled workmen and can earn Re. 1 a day. The average workman makes rough clothing for local purposes and earns from 6 to 8 annas. The difficulties and suggestions applicable to Agasteeswaram taluk can be quoted here also.

Mat making.—Palmyra mats and baskets are made by thousands of the local people and sold in the markets. Large quantities of them are sold for packing and other purposes. This is now a cottage industry without any organisation. If it is organised properly, it would relieve the condition of many poor people who are now left in the hands of the merchants. The average earning of a mat-weaver is Rs. 3 to Rs. 4 a month, for spare time work. The work is mainly done as an additional source of income and the low caste women are particularly proficient at it. Baskets of fine texture and all kinds of useful articles for local people are made. There is a great future before this cottage industry. A depot for instruction and organisation is the essential first step. Bulletin No. 6 also refers to this.

Blacksmithery and Carpentry.—There are more than 200 carpenters and 50 blacksmiths in the taluk, and many are clever workmen. Their main work is making building materials and agricultural implements. The average earning of a carpenter is 8 to 10 As. a day and that of a blacksmith 12 As. to Re. 1. Several of the blacksmiths make exceedingly good knives and tools.

Lace and Embroidery.—Like the neighbouring taluks of the Southern Division, lace and embroidery is made by the women attached to the Mulagumudu Convent and L. M. S. Nagercoil. The industry is smaller here than elsewhere as no organised system of distribution or collection is working nor has any central institution for teaching and control been established as in other taluks.

Coir Industries.—Almost all the cocoanut husks are either neglected or used as fuel for want of soaking facilities. If coir extractors could be introduced the coir industry would thrive well, though of course the cultivation is only limited here.

Palmyra Industries.—Brush-making can be introduced as a cottage industry and a depot established for the collection of finished products. Match-boxes can be made out of palmyra leaf, if a factory for match-making is started in South Travancore.

Weaving can be organised and worked on a larger scale. Along with this industry hosiery manufacture and allied industries can be begun on a cottage basis. Socks, banians, etc., could all be made here.

Kitul Fibre.—There are many palm trees in the taluk from which kitul fibre could be extracted. At present this is only done by fishermen but the establishment of a wider market will bring the industry on to a more profitable basis.

Foodstuffs used and available locally.—Rice, tapioca, cocoanut, yams, grams, peas, and vegetables. Fish is an important article of food.

Economic Statistics.

There are about 29,000 men engaged in agriculture and some thousands may be reckoned as being employed in other industries. They are set out as follows:—

Craft.	Number.	Wages.
Carpenters	221	8 As. to 10 As. a day.
Masons	63	7 As. to 9 As. a day.
Blacksmiths	about 50	12 As. to Re. 1 a day.
Oil-pressers	Some hundred	8 As. to Re. 1 a day.
Jaggery makers	Some hundred	4 As. to 8 As. a day.
Mat-makers	about 1000	Rs. 3 to Rs. 4 a month for spare time work.
Coolies	Some thousands	5 to 7 Chs. a day.

Cost of Living.—

Cultivator's family Rs. 30 a month on an average.

Cooly's family Rs. 7 to Rs. 10 a month.

Single person (Middle class) 10 Chs. a day.

Number in a family.—

Cultivator's family 6 persons on an average.

Cooly's family 3 to 4 persons on an average.

No. of Voters 143.

Co-operation.

	Members	Capital.	Profit.
		Rs.	Rs.
The Padmanabhapuram Co-operative Credit Society, Agricultural.	61	3696	47
The Thucklay Co-operative Trading Society.	44	1020	108—10 s.

Joint Stock Capital.

No Joint-stock companies exist.

Capital and Remaks.

The total co-operative capital is Rs. 4,716 and there is no joint-stock capital in existence. The taluk is not rich in floating capital and it can only be by co-operation or a Land Bank that money can be raised for purposes of development.

TOVALA TALUK.

Area—129·97 sq. miles. Population—34,503.
 No. of houses—7,774.
 No. of Voters—288. No. of pakuthies—10.
 Taluk town—Bhutapandi.

Location.

Division.—It is situated in the eastern portion of Padmanabhapuram Division.

Boundaries.—NORTH & EAST.—Tinnevely District, British India.

SOUTH.—Agasteswaram Taluk.

WEST.—Kalkulam Taluk.

Backwaters & Rivers.—This taluk lies inland and has no backwaters touching it. It is mountainous. The Anantan Aur, the Pazhayar, and the Puthen Aur have their source in the mountains of this taluk. They are unfit for navigation.

Main Roads and Village Roads.—A branch of the Main central road goes to Tinnevely and is the most important means of communication between Tinnevely and South Travancore. Most of the import and export trade to Tinnevely goes through this road. Another road runs north from Nagercoil and passes right up to Bhutapandi and thence through Azhakiapandipuram to the tea and rubber estates. A road connects Bhutapandi with Aramboly and is the southern outlet.

Nearest seaport.—Colachel is the nearest seaport town and is 16½ miles distant from Bhutapandi.

Cultivation.

Wet land area—10,862 acres. Dry land—12,287 acres.
 Unregistered land—12,832 acres.

Pakuthies.

Name of Pakuthy.	Area sq- miles.	Population. persons.	Wet land acres.	Dry land acres.	No. of cocoanut trees.
Azhagiapandi- puram	4.79	4380	1312	874	613
Anandapuram	4.92	2240	1349	1250	3469
Cheramadam	4.30	700	669	812	945
Isanyamangalam	2.10	1420	772	234	125
Bhutapandi	1.14	1140	477	91	368
Arumanallur	2.67	830	714	357	256
Darisanamkoppu	6.60	2390	1189	370	720
Thazhakudi	3.56	4750	1304	434	438
Thiruppadisa- ram	2.40	19180	994	556	1083
Champakaraman- pudur	5.91	3080	1068	2737	147
Thovala	19.33	7570	1014	11385	305

Education.**GOVERNMENT VERNACULAR SCHOOLS.**

No. of H. G. Schools, 1. No. of boys, 268.
 No. of L. G. Schools, 12. " 1031.
 No. of girls, 279.

AIDED.

No. of L. G. Schools, 21. No. of boys, 813.
 No. of girls, 355.

UNAIDED.

No. of Schools, 4. Pupils, 119.

GOVERNMENT VERNACULAR SCHOOLS FOR GIRLS.

No. of L. G. Schools, 2. No. of girls, 122.

AIDED.

No. of L. G. Schools, 3. No. of girls, 145.

ENGLISH SCHOOLS.

Government L. G. English School, Bhuthapandi.

No. of Forms. 3. No. of boys. 140. No. of girls 4.

There are no English Schools for girls.

INDUSTRIAL SCHOOLS.

No Industrial Schools are in existence in the taluk.

Natural Products and their Present Utilisation.

Paddy.—This is the most important foodstuff of the people. There are 10,862 acres of paddy land, all of which is double-cropped. The paddy is grown for local consumption and for export to the neighbouring taluks and British India.

Palmyra.—There are more than one lakh of palmyra trees found in the taluk. About two thousand trees were tapped for toddy last year. The toddy is locally consumed. Many thousand trees are tapped for sweet toddy and manufacture of jaggery. Jaggery is exported to the sugar mills at Tinnevely. A small portion of the jaggery is consumed locally. The leaves are turned into mats and the leaf-stalk into fibre which is exported from Tinnevely to Tuticorin.

Sugar-cane.—Sugar cane is grown on the banks of the rivers to a small extent and the product locally consumed. There is little scope for developing this cultivation.

Tapioca.—Tapioca is grown in fair quantity in the taluk specially in Azhakiapandipuram and Arumanalloor pakhuthies. It is an important foodstuff among the poor people. The increase of the cultivation in the taluk should receive careful attention.

Tea.—There are two estates for the cultivation of tea in the taluk and over 314 acres are growing tea. The estates are mostly under European management although one or two Indian companies are now working. The tea is exported via Tinnevely.

Coffee.—The plant is cultivated only in a small quantity in the taluk. Two small plantations are working under the European manager of the tea estates. The total area under coffee cultivation is only 37 acres.

Fruits.—Plantains, pomegranates, oranges, pine-apples, mangoes, jacks, are among the important fruits grown in the taluk. They are cultivated only to meet the local demands.

Other products.—Cholam, Kovaraku, gingelly and grams are grown to a small extent in this taluk.

Trees and Timber, Oil-bearing trees.—Pinnay and Illuppai are among the most important.

Other trees.—Blackwood, Maruthi, Seelanthi, Nilavaka and other forest trees.

Minerals.

Pyrrhotite.—Iron sulphide is found in valleys of hills, Mangamalai, Periamala and Magamalai.

2. In a place $\frac{1}{4}$ mile south of Pannycode.

3. In a locality 2 miles west of Arumanallur.

An extensive area of iron-sulphide is found in the taluk.

Lime-Stone.—Lime-stone is found near Kumarapuram and Kanakapur and at Layam. The deposit is large in this taluk.

Graphite.—Graphite of good quality is in existence in the west of Arumanallur, at Shorlacode and at Aramboly. It is not yet fully investigated, but the quality obtained is decidedly good.

Chalcedony.—Chalcedony is found in the taluk in quantity at Amanad. The quantity is not fully estimated but the quality seems to be good.

Existing and Possible Industries.

Agricultural.—Paddy cultivation is the most important industry and engages the attention of about 14,000 persons. Tapioca growing and cultivation of cereals and other things occupy some hundreds of people most of whom are workmen in the fields. There are about 200 land-lords who have an income of about Rs. 1000 a year on an average. The small land-owners get Rs. 300 per annum on an average. The middle class land owner spends Rs. 30 a month and in the majority of cases, little is left for him to lay by. The agricultural labourer earns about 7 Chs. a day and this is barely sufficient for his daily expenses.

Palmyra Industries.—Palmyra trees are tapped for toddy making and jaggery manufacture. The toddy drawers are a special community known as channars. Many of them

are leaving the profession owing to its arduous nature and the small remuneration obtained therefrom. A toddy drawer realises from Rs. 7 to Rs. 10 by the profession. The payment is generally made in kind.

Owing to the fact that trees tapped for sweet toddy and the manufacture of jaggery, are not taxed, many hundreds of people are engaged in this industry. The sweet toddy is evaporated and boiled into a thick liquid which is allowed to cool and to drain away and jaggery is obtained. Most of this is exported to Tinnevely. If a sugar factory is started in South Travancore, the demand for jaggery will be great and the production correspondingly increased.

Palmyra fibre industry is carried on to a small extent in the taluk. The product is sold to local agents and exported.

Mat and Basket making.—The industry employs about 2000 persons in the taluk. The large quantity of palmyra trees available in the taluk makes it a successful cottage industry. Mat and basket making is mainly carried on by women in their leisure hours and the industry brings an additional income of Rs. 4 to a family. The mats are sold to merchants, in the local bazaars, who export them to other taluks and also to places outside Travancore such as Tinnevely. In addition to this industry, match-boxes can be made out of the leaves and the making of the boxes can be taught in a depot and school established in the taluk town.

Grass mat weaving.—In addition to the palmyra mats, grass mats are also made in the taluk. The raw material called "Kora" grass is brought down from the forests and mats are woven in a loom. A large number of skilled workmen is found in Chempakaramanputhur pakuthy.

Shellac Industry.—Lac bearing trees are found in the forests near Aramboly and several trees are found to bear lac. They belong to the acacia species of which locally the *Acacia Parviflora* is the important. It is noted that stick lac was formerly cut from the forests by woodmen who frequent them and sold it in the local bazaars at a nominal price. It is difficult yet to estimate the quantity produced every year for the merchants who buy do not keep records of the quantity bought or sold. In any case it is only small and the supply obtained is not regular and no fixed price is given. The Government have now taken up the industry and appointed an

expert for the rearing of lac-insect and introducing the industry on a commercial scale. Work in this direction has already been begun at Aramboly. Excellent samples of lac have been found and also the indigenous lac-insect. Cultivation of this insect is proceeding and the demonstration of rearing and lac production has started in a specially reserved portion of the forest. Seeds from other parts of India are being introduced.

Pottery.—Potters are found scattered about in the taluk. About 100 families can be said to be working in this industry. The clay required for the purpose is plentiful. At the present time only local demands are supplied by the potters.

Weaving.—There is a small community of weavers in Bhoothapandy and isolated weavers are also found in the different parts of the taluk. These men live a poor life, earning between Rs. 8 and Rs. 12 a month by this craft. In some cases the cloths manufactured vary according to the pattern in demand but in the majority of instances a weaver does not change his old patterns and consequently undersells his goods. It is therefore essential that a weaver's co-operative union and depot should be established, where the modern patterns in demand could be kept for inspection and the different weavers could study them and make their articles accordingly. Agasteeswaram report contains remarks on weaving applicable to this taluk also.

Cotton.—The cultivation of cotton near the foot of the Hills in this Taluk is a possible direction for development. There are large areas of land uncultivated at present, which seem highly suitable for cotton cultivation. The matter is one for experiment and if a small area was taken and cultivated it could be demonstrated as to whether this form of cultivation was profitable and suitable. It is certainly a point for attention and investigation in this Taluk.

Economic Statistics.

There are about 14,000 agricultural labourers and about 1000 skilled artisans engaged in other crafts.

Craft.	Number.	Wages.
Carpenters	240	Earn 6 to 8 As. a day.
Masons	120	Earn 6 to 8 As. a day.
Weavers	a few.	Earn 6 to 8 As. a day.

Craft.	Number.	Wages.
Mat weavers.	Some hundreds.	Rs. 3 to Rs. 4 a month.
Toddy drawers.	Some hundreds.	Rs. 7 a month.
Coolies.	Some thousands.	7 Chs. a day.
<i>Cost of living.</i> —Cultivator's family.		Rs. 25 to 30 a month.
Cooly's family.		Rs. 6 a month.
Single person.		Rs. 7 a month.
<i>No. in family.</i> —Cultivator's family.		6 persons on an average.
Cooly's family.		Three to four persons on an average.

Co-operation.

There are no co-operative societies in existence in the taluk.

Joint Stock Companies.

No joint-stock companies are registered in the taluk.

Capital and Remarks.

This being a frontier taluk has many unique chances for industrial development. It is near to Tinnevely. The capital available for industrial work is small. The Shellac will be a most suitable industry here.

CONCLUSION.

The facts and figures stated herein have been obtained with as great accuracy as possible. The numbers of persons indicated in particular crafts are approximate and include only those actually available for work and working at the time of collection of data. The task before us now is to concentrate on the several outstanding points of the report in each taluk. Two years' investigations could not exhaust the wealth of Travancore, but I have attempted to indicate the possible developments in the immediate future. Much remains yet to be done and subsequent publications will indicate further investigations into specific points of industrial importance. The economic statistics refer to normal times and have only been obtained with difficulty as the figures fluctuated greatly in the last few years. Nevertheless they may be considered as the average for normal times, before the present economic difficulties arose. Finally, I commend all the points raised to the earnest attention of all.

S. G. BARKER.

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2003-04