

PRELIMINARY REPORT
ON THE
SURVEY OF COTTAGE INDUSTRIES
IN THE
MADURA, RAMNAD, TRICHINOPOLY AND
TINNEVELLY DISTRICTS

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Introduction.

By the time I completed the survey of Anantapur district, at the end of November 1927, the Government had sanctioned on the recommendation of the Director of Industries, the appointment of three Special Tahsildars to assist me in the survey work. According to the line of work indicated by the Director of Industries, each Special Tahsildar was to carry on the survey of a district independently by himself subject to my supervision and inspection while I myself was to conduct the survey of a separate district, besides conducting the economic survey of two villages not only in the district surveyed by me, but also in the districts surveyed by each Tahsildar. One of the three Tahsildars was appointed towards the end of November and he was assigned the survey of the Tinnevelly district which he commenced about the middle of December 1927 while I undertook the survey of the districts of Madura and Ramnad. The second Tahsildar joined duty at the end of January 1928 and began his work in Trichinopoly in the first week of February. The survey of the four districts was completed by the end of March 1928. This report deals with the survey done in the four districts by the two Tahsildars and myself.

Madura was the first southern district that I took up for the survey and my experience was unfortunately not very happy. While in the Ceded districts I found workers ready to co-operate with me by giving information of their trade and by explaining their difficulties, in Madura I found them showing great reticence and looking upon my enquiry with suspicion as one undertaken to discover their trade secrets for the benefit of European interests. In fact, this suspicion was expressed to me by one of the literate Sowrashtra merchants of the Town. Not discouraged by this attitude, I proceeded with the survey and was able to gather with extreme difficulty as much useful information as possible, thanks to the help of the local Revenue authorities. My experience of the people outside Madura Town was however different. They were not so suspicious as those in the Town and when they were made to understand the nature of the work I was expected to do,

I found them willing to co-operate with me more readily. This seems to have been the experience of the Tahsildars also in the districts surveyed by them.

All these four districts are predominantly agricultural and over 75 per cent of the population live by agriculture and tending of sheep and cattle. In each district and in all important rural villages there is the organization of the village artisans (though disintegrated to a large extent) of carpenters, barbers, blacksmiths, potters, etc., who carry on their immemorial trade working for the ryots according to old tradition and customs and carrying on the industries which are so essential for their well-being but not outside the common run. Among them here and there we find some craftsmen of art displaying their skill in wood and stone carving and making beautiful metalware of domestic use and attractive curios of metal and ivory such as spiders, frogs, snakes while others eke out a living by making cheap toys of attractive colours which are sold to pilgrims. The religious importance of these districts on account of the famous shrines of Trichendur, Madura, Rameswaram and Srirangam which attract thousands of pilgrims from all parts of India, has helped to preserve and foster some of these small industries while the great spinning mills at Madura and Tinnevely and the rich growth of korai on the banks of the Cauvery and its branches have helped the development of the industry of cotton weaving and mat making respectively which afford means of living to a large population.

Next to agriculture, the industries that employ the largest number of workers besides cotton spinning in mills, are the hand-loom weaving and mat weaving and I deal with them among others in the following paragraphs.

Hand Spinning.

Connected with industry of hand-loom weaving is the industry of hand-spinning. In a cotton-producing tract where the hand-weaving industry is carried on on a large scale, one would naturally expect to find the industry of hand-spinning to co-exist with it but the case is otherwise. In the district of Trichinopoly it is not heard of. In Madura I could spot out only one village, Kasipalayam, about 25 miles from Dindigul where this industry has been organized. In the Tinnevely district, Thisayanvalai, Padukkapattu, Nayanapuram, Thalai and Visvanathaperai have a few wheels working. In Srivilliputtur taluk of the Ramnad district, Rajapalayam, Srivilliputtur, Pudupatti, Maharajapuram, Meenakshipuram, Komandipuram and Settur have in all about 1,194 spinning wheels in operation.

Though immemorial existence has been claimed for the industry in these districts, there is no doubt that the activity of the spinning wheels was revived only about 1920-21. With the waning of enthusiasm for khaddar cloth brought about by the Non-co-operation movement, the industry has steadily declined and is completely dead except in a single village of Kasipalayam in the Madura district and Visvanathaperai in the Tinnevely district. Srivilliputtur taluk alone in the Ramnad district is exhibiting some activity in this respect and I think that the personal care and interest taken by the Raju population of the village in promoting this industry has preserved it from extinction.

Madura District.

The organization at Kasipalaiyam is a small one and made to live on sentiment and patriotism. It has been the work of a society called 'Khaddar Development Society' which has collected Rs. 820 in shares of Re. 1 value from every family of some means in the village. Each shareholder is also bound by understanding to purchase his requirements of clothing from the depot, so much so, that in a year the society made a profit of Rs. 200 on a capital of Rs. 820.

The cotton required for ginning is grown on dry lands of the village; it is locally known as 'Nadan or short staple.' There are 100 spinning wheels in the village worked by the womenfolk, who are supplied with cotton by the society. For 30 lb. of seed-cotton given to a woman, she has to deliver to the society a little less than 7 lb. of spun yarn of 10s to 12s and 23 lb. of seed. The wages amount to Rs. 3, ginning, carding and spinning charges included. The time usually occupied in spinning this quantity when assisted by another woman in preliminary processes is a fortnight. The society gets the yarn woven into cloths for underwears, shirtings and coatings, by the weavers in Kurumbarapatti village in Karur taluk of the Trichinopoly district which is 8 miles from this village. The weaver earns wage of Re. 1 a day for weaving khaddar cloths.

Tinnevely District.

In Thisayanvalai and a few villages adjoining it the movement is of recent origin. There was only one single enthusiast who used to purchase the yarn spun by the womenfolk who are mostly Adi-Dravidas and who number about 300, at unusually high rates, the spinners purchasing cotton at Rs. 6-13-0 per maund of 25 lb. against the ordinary rate of Rs. 2-8-0 to Rs. 4 prevailing elsewhere. He has since given up the business apparently owing to the difficulty in marketing the goods. In Padukkapatti, Thalai

and Nayanapuram, the yarn spun is sold to Paravars from Manapad who purchase it for making fishing nets. By far the best spinning is done only at Visvanathaperai where Kshatriya and Kamma women have attained proficiency through long practice. It is said that they produce counts as high as 60s but that seems an exaggeration especially when there is no standardized measurement adopted for testing the yarn. There are 50 spinning wheels at work and the cotton required is obtained locally as it is grown in the village and its neighbourhood. The local rate is Rs. 2-14-0 to Rs. 4-8-0 per maund of 25 lb. The ginning and carding are done by hand as elsewhere and a woman working 10 hours is said to earn 3 to 4 annas a day. The wage earned is really good but I doubt if there is not an element of over-estimation in it. The hand-spun yarn is not woven into cloth in the village itself though there are 40 houses of Illathupillaimars who weave with mill yarn but is purchased by the khaddar merchants who come from Rajapalayam for the purpose. In 'Pandarasivan Memorial School' at Kulasekharapatnam hand-spinning is taught for half an hour making use of takli instead of the spinning wheel.

Ramnad District.

In the Srivilliputtur taluk, Rajapalayam is the centre of organization for khaddar trade and there are three merchants who have depots for purchasing yarn and sale of khaddar. The annual output of cloth is valued at Rs. 50,000 and the sales appoximate to this amount, the important places of export being the Northern Circars, parts of Madura, Tinnevely and Trichinopoly districts. A large quantity is consumed locally by Rajus who invariably clothe themselves in khaddar. The spinners are Kamma and other caste women who are far advanced in spinning, turning out fine yarns of 30s and 40s. They do the ginning by a hand gin and carding by a small bow in addition to teasing by hand. The spun yarn is standardized to a length of 840 yards to a hank and a fixed rate of one anna is paid per hank. This acts as an incentive to finer spinning as a given weight of cotton when spun into finer counts would bring more money than when it was spun into coarser counts. The coarser the count, the number of hanks produced in a pound of cotton would be less and the wages earned correspondingly lower.

	RS.	A	P.
Economics of spinning—			
Cost of cotton with seed 1 lb. (7 palams)	0	3	4
When ginned the yield is—			
Ginned cotton $2\frac{1}{2}$ palams.			
Seed $4\frac{3}{4}$ palams.			
(There is a slight wastage which is negligible.)			
Sale price realized for seed	0	0	5

Cost of carding $2\frac{1}{4}$ palams of lint at 4 pies per palam is 9 pies.

Thus the net value of the carded cotton is 3-4 plus 9 pies minus 5 pies or As. 3-8.

This quantity of lint is converted into 10 hanks and sold at anna 1 per hank or the sale price is Re. 0-10-0.

Time taken to spin 10 hanks is five days.

The net earning for five days is As. 10-0 minus As. 3-8 or As. 6-4 for five days or As. 1-3 per day

There are about 100 handlooms in the village fitted with fly-shuttle slay which are solely engaged in khaddar weaving. The weavers purchase the yarn from the depots at the rate of 12 hanks per rupee and sell the cloths to the same depot keepers at the rate of 14 annas per yard of 53 inches wide. The depot keepers make a profit of 6 pies per yard.

I give below the comparative cost of production of handspun cloth with mill cloth of the same counts as given by one of the depot keepers :—

	Cost of cloth handspun.	Cost of cloth.	
		Mill made.	Hand made.
	RS. A. P.	RS. A. P.	RS. A. P.
52 yards long and 53" wide 36 kalis of yarn ..	30 0 0	10 0 0	10 0 0
Warping charges and sizing	5 0 0	2 8 0	3 0 0
Weaving charges	9 12 0	1 12 0	3 4 0
	44 12 0	14 4 0	16 4 0
Time occupied ..	20 days.	3 days.	8 days.

The above figures show not only that cost of handspun yarn is much higher than the mill yarn but also that the charges for weaving, warping and sizing are considerably higher on account of the trouble involved in weaving and warping fibres of yarn of comparatively less strength and uniformity. The looms engaged in khaddar weaving have however steady work all round the year, while the fate of these looms using mill yarn depends on the work offered to them by the master weavers and traders, who regulate their business according to the market conditions. When there is a rise in the price of yarn or when the demand for the varieties of cloths exported by them is low, they not only cut down the usual wages, but also the volume of work given to them. The condition of the former so long as the khaddar organization is ready to purchase the hand-woven cloths appears fairly bright.

The economic value of this cottage industry has been discussed by various associations and individuals and it seems unnecessary for me to repeat the arguments in favour of or against

its revival. As a subsidiary industry during the period of agricultural inactivity which lasts for two to three months hand-spinning has great possibilities in this group of districts where cotton is grown extensively. The method adopted in ginning, carding and spinning is the same everywhere in the districts so far surveyed with little or no variation and any method by which carding cotton could be improved may be desirable for adoption but a reversion to condemned methods of spinning by using a thakli instead of a wheel as in a school at Kulasekarapatnam is not likely to advance the development of the industry.

Handloom Weaving.

Madura District.

The population of the Madura district according to the last census is 2,007,082, of whom 73,840 are engaged in weaving and the processes connected therewith. By far the largest number are Sowrashttras who have migrated into Madura some centuries ago. The other classes of people who are engaged in weaving are Sedas, Kaikolars, Sengunda Mudaliyars, Devangis, Christians, Muhammadans and Adi-Dravidas. The Sowrashttras have been following this profession from time immemorial and have acquired special skill in weaving superior cotton and silk fabrics. Their superiority is recognised even by their own community living outside Madura town. Next to them in proficiency come Devangis who handle silk and art silk. These are distributed over Dindigul and Nilakottai, and Chinnalapatti is the centre where they are numerous. The other castes are distributed all over the district and the important centres among them are Dindigul, Palni, Sedapatti, Jakkampatti, Andipatti and Mansapuram. Adi-Dravida weavers are found in Nilakottai and Madura taluks. Fabrics manufactured in this district are pure silk saris to a limited extent in the Madura city, art silk saris in Madura, Dindigul and Chinnalapatti, lace cloths, dhotis, sadis, veils and scarfs in Madura, lace turbans and dhotis in Dindigul, coloured sadis of cheap variety in Nilakottai, Palni, Sedapatti, Andipatti, and towels and coarse white cloths in Thirumangalam and other places. Apart from silk and art silk, the main counts of yarn in use are 20s to 200s, the finer counts being used only in Madura and Dindigul. In all other places 20s to 40s alone are used. The yarn of lower counts is obtained from the local mills which are three in number and those of finer counts are imported from Madras. Very little of dyed yarn is obtained from outside the district, Madura having acquired a good reputation in dyeing. At Vadugupatti and Sedapatti black yarn is imported from Chidambaram as it is said to be superior. The

weavers of towels at Mansapuram get their yarn of $14\frac{1}{2}$ s from Bangalore as they find it more suitable for their work than Madura yarn. There are many wholesale and retail dealers in yarn in Madura, Dindigul and other big centres from whom local weavers draw their supplies. Silk is got from Kollegal and Bangalore, while the art silk is imported from Madras and Bombay.

The practice in this district is generally to supply prepared warps to weavers by their employers. In Madura town, as also elsewhere, there is a special class of people called Naickens who size the warps. In Madura city the warps are shorter ones, just sufficient to weave one or two fabrics of 16 yards long, while the warps prepared in other places are 100 to 120 yards long and are sized in streets by 20 to 24 persons working at them. There is every kind of warping in Madura from peg warping to beam warping. The warping mills in use are not costly ones as found in the Cuddapah and other districts but a smaller and cheaper contrivance fixed vertically instead of horizontally and costing a few rupees not exceeding Rs. 10 to Rs. 15. Sometimes, even bamboo slits are used in making the plant. As found elsewhere, the members of the weavers' family, especially female members, engage themselves in winding yarn for weft and in assisting the male members in the various processes of weaving. The Sowrashtra boys also assist their parents in hawking goods manufactured by them. Generally, males are engaged in weaving cloths, though in Madura town women also do the weaving to some extent.

There are about 16,000 looms in the district, of which less than 50 per cent are fitted with fly-shuttle slay. Except in Madura and Dindigul, we find very few looms fitted with dobbies. The looms are mostly pit looms, except in Madura and Dindigul, where frame looms are seen in fairly large numbers. In Palni, while in one street weavers use all fly-shuttle looms, the adjoining street weavers use only the ordinary hand-looms with no fly-shuttle. The only inference that can be drawn from observations made in the district is that Patnoolkars and Sowrashtras working in finer varieties use hand-shuttle looms, while Kaikolars and others who work in whites and cheap saris use fly-shuttle looms.

The trade in cloth is in the hands of capitalists and the majority of the weaver population is under their control. There are yarn merchants who supply yarn and take back the finished goods, while others sell to the weavers yarn and lace required for their work mostly on credit system charging interest for overdue payments made beyond the month's grace time allowed, while there are still a few master workmen who engage weavers

on piece-work and pay them according to certain rates agreed upon. These capitalists always have a strong hold upon the workers by making them advances to meet their domestic expenses and no labourer can cease working for his master until his debt is paid off either by himself or by some other master workman who engages his services.

The markets for the goods manufactured in this district, especially for the finer varieties made in Madura and Dindigul, are Bombay, Calcutta and Northern India, besides all parts of the Madras Presidency. The cheaper variety of sadis and coarse cloths manufactured over other parts of the district are largely exported to Ceylon, the Straits Settlements, Burma, Penang and other places where immigrant coolies from South India are employed in plantations.

The wages earned by ordinary weavers throughout the district do not exceed 6 to 8 annas per day. When they work on looms fitted with hand-thrown shuttle they hardly exceed 6 annas, but those who work with fly-shuttle are able sometimes to earn 8 annas per day. Independent workers who purchase their own yarn and sell the goods in the market make about 2 annas more than ordinary weavers. Weavers of silk and lace cloths in Madura and Dindigul earn a wages of 12 annas and sometimes even Re. 1 per day when they weave in lace. This in general is the sketch of the conditions prevailing in the handloom industry.

Madura City.

The population of the city according to the last census is 138,894. More than a third of the population are Sowrashtas who are the largest class among weavers here. Some of the Sowrashtas are good at carpentry and smithy, a knowledge of which helps them a good deal in manufacturing their own looms. A large section among them is engaged in dyeing and, unlike many other places, Madura has a number of women—about 500—engaged in weaving. The number of looms in the Madura municipality ranges from 8,000 to 12,000 which during marriage and festive seasons, especially during Deepavali, rises nearly to 15,000. About 5,000 among them are fitted with fly-shuttle slay, while there are a thousand dobbies and a thousand Amphil harnesses at work in the city. The number of looms using various counts of yarn are given below:—

- 2,000 looms work with 100s, 150s and lace.
- 2,000 looms work with 60s, 80s and lace.
- 2,000 looms work with 20s to 40s and the rest below 20s.

Pure silk is also woven and there are about 100 looms working in it exclusively. Artificial silk is the rage now and a variety

of fancy cloths, such as napkins, tablecloths and wall hangings; etc., are woven and hawked at the railway station to European passengers. Besides weaving of lace cloths of fine texture for men's upper wear, fine saris, veils, scraps, etc., for export to Northern India, saris of lower counts with lace border for conversion into Chunnadi red cloths for which Madura town is famous are also woven. Towels, bedsheets, shirtings, and fine lace cloths with embroidered borders are also produced.

The warping is done mostly in mills and the winding of the weft yarn is done by the female members of the weaver's family. Sizing is not done by the weavers but there is a special class of people called Nayakars about 350 families who have been supplying weavers with sized warps. The departmental hot air sizing machine has been supplying warps to a large number of weavers who use lower and medium counts at rates less than half that charged by the Nayakars. There is also a wooden hand sizing machine side by side with the patent machine in Madura and both these have been well received. The usual rates for weaving are :

20s of 54" wide	are Re. 0-0-11 per yard.
40s	" " 0-1-3 "
60s	" " 0-1-6 "
80s	" " 0-1-9 "
100s	" " 0-2-0 "
150s and 200s	" Rs. 9-0-0 per 30 yards.

When lace is used either in body or border, extra wages are paid in proportion to the work ranging from 6 pies to 3 annas per yard.

More than half the quantity of the goods produced are exported to Federated Malay States, Singapore, Burma, Ceylon, and Penang and the monthly production of cloth, apart from the sale of yarn, amounts to several lakhs of rupees.

Dindigul town is famous for rumals or lace turban cloths which are usually of 90 inches by 90 inches. These are manufactured on big looms which require 2 men to work them. There are about 200 looms engaged in weaving rumals and lace cloths and of these about 50 are fitted with fly shuttle slay. The weavers are all Sowrashtas and they work for Sowcars who supply them with yarn and lace and pay wages at piece rate system. The fabrics manufactured here are rumals and lace upper cloths which are largely exported to the Northern India and to parts of the Bombay Presidency, Bengal and other places. Female cloths are also manufactured from lower counts of 20s and 30s and these are consumed locally. The yarn generally used for weaving rumals and lace upper cloths are 100s/150s and are obtained from Madras. Lace for the borders of rumal cloths is obtained from Surat and

Pondicherry. The lace of Surat is inferior in quality and as such becomes black after some time. For rumal cloths generally brass lace is used to keep down the cost. A rumal of 90 inches by 90 inches is sold for Rs. 2-12-0 to Rs. 3-0-0, and the minimum quantity of lace used in it is worth about 6 annas. A piece of 20 such rumals can be woven in 15 to 20 days on ordinary looms with 2 men working and on fly shuttle looms in 20 to 30 days with only one man working. The wages paid for weaving a piece is Rs. 19 to Rs. 21, in either case. The merchant who supplies yarn should himself pay for the warping and sizing charges which come to Rs. 3 per piece. If rumals are woven with lace kottadi by using lace both in the warp and weft at regular short spaces so that squares may form in the body an additional charge of Rs. 1-4-0 per rumal is paid. Such rumals take up double the time that is taken in weaving the ordinary ones. Dindigul town alone consumes about 300 marks of silver lace, each mark weighing 21 tolas, and 100 to 150 marks of brass lace.

Except at Usilampatti and its surroundings and in the Tirumangalam taluk where only towels and bedsheets are manufactured, the other centres of the districts especially Nilakottai, Periyakulam, Sedapatti, Jakkampatti, and Palni manufacture only sadis of cheap coloured pattern using all kinds of colour. Among those largely used are red, yellow, black, green and blue and some of these are often combined to improve the appearance. In some centres like Jakkampatti and Mansapuram where there are 800 and 100 looms respectively all the looms are fitted with fly shuttle slay but in Sedapatti of Periyakulam division there are about 1,000 looms with no fly shuttle. In Palni where there are 300 looms, the looms in the Senior street are fitted with fly shuttle slay but those in Sowrashttra quarters are ordinary ones. Those who weave in whites and coarse counts readily adopt the fly shuttle looms whereas those who work in higher counts of yarn and silk prefer to use hand shuttle only on account of the common belief that fly shuttles are not quite suitable for delicate fibres. Practically no dyeing is done by the weavers as they get all the dyed yarn from Madura. The wages paid for warping and sizing vary according to the length of the warp. In Jakkampatti where sizing is done in streets a warp is about 100 to 120 yards long and for sizing the same 20 to 24 coolies are engaged, at 2 annas each but they finish sizing in 3 hours. Sowcars who supply yarn to the weavers supply them with necessary sizing materials and pay them wages for sizing and warping. Charges for warping and sizing a warp of 32 cubits long are 3 and 6 annas respectively. In Periyakulam a few families are engaged in weaving lungis and kailies but this is done on an insignificant scale.

A weaver at Jakkampatti is able to earn about 8 annas per day by weaving 15 sadis of 12 cubits long and $2\frac{1}{4}$ cubits wide in 12 days and getting Rs. 5 as wages. At Mansapuram where white towels are manufactured 16 madis of 4 cloths each, each cloth measuring 4 cubits long and $2\frac{1}{4}$ to $2\frac{3}{4}$ cubits wide are woven in 15 days and the wages paid amount to Rs. 9. A madi is sold from Rs. 3 to Rs. 3-2-0 and the yarn required for weaving a madi is 16 ladis costing Rs. 2. The cloths manufactured at Mansapuram are sold by weavers themselves in shandies and markets and they buy the required raw material from Tirumangalam merchants for cash. Economics for weaving 32 cubits long and $2\frac{1}{4}$ cubits wide of coloured sadis :—

						RS.	A.	P.
Red yarn	$2\frac{1}{2}$ ladis	..	..	..	..	1	4	0
Yellow	2 ladis	..	..	..	..	0	12	0
Black	$1\frac{1}{2}$ ladis	..	..	..	..	0	9	0
Mercerised		..	..	..	..	2	4	0
Weft yarn	4 ladis	..	..	..	..	1	8	0
Warping charges		..	..	..	..	0	3	0
Sizing charges		..	..	..	..	0	6	0
Silk for use in the woof		..	..	..	..	0	8	0
Wages for weaving		..	..	..	..	3	8	0
Total						10	14	0

Weaving is done in four days on a fly shuttle loom and 6 to 7 days on ordinary looms. Fabrics woven are 2 sadis and are sold for Rs. 11 or Rs. 11-8-0.

Ramnad District.

Ramnad though a separate district does not differ in any way from the Madura district in its agricultural or industrial conditions and here also handloom weaving is next to agriculture the mainstay of a large section of people. The population of the district as per last census is 1,721,837 and of them 27,657 are engaged in weaving industry. The chief classes of people engaged in weaving are mostly Sowrashtas at Paramakudi and Emeneswaram, Devangis at Aruppukottai, Sengunda Mudaliars at Mandalamanikkam, Saliers at Srivilliputtur, Sedars, Seniors, Muhammadans and Adi-Dravidas elsewhere in smaller numbers. The cloths manufactured in this district may be roughly divided into the following kinds:—Whites from 20s to 24s in Srivilliputtur, Chatrapatti and Aruppukottai, finer white fabrics from 40s to 100s at Emeneswaram, ordinary cheap coloured sadis from 20s to 30s

at Aruppukottai, Rajapalaiyam, Mandalamanikkam and Karaikudi, silk fabrics from pure silk, silk mixed with cotton at Paramakudi and Ramnad, and lungis in Aruppukottai. There are about 17,315 looms in all in the district of which more than 13,000 looms are fitted with fly shuttle slay. Only at Paramakudi which is engaged in weaving silk fabrics of costlier variety with borders of silk and lace, the looms are mostly of ordinary type but in all other places most of the looms are fitted with fly shuttle slay. This is, perhaps, due to the fact that the bulk of the weaving in this district is in whites and in cheaper variety of coloured sadis where the weft yarn is taken throughout the breadth of the sadis. Most of the yarn required for weaving especially of lower counts is obtained from the Madura and Papanasam Mills and the dyed yarn from the Madura town where dyeing is done on a large scale. Even in this district as elsewhere the whole industry is Sowcar ridden and the workers are practically low paid coolies working for the benefit of their employers. Sizing is done in streets by the weavers themselves and a warp is generally from 100 to 120 yards long. The Sowcars pay them Rs. 2-0-0 to Rs. 2-4-0 for sizing including cost of sizing materials. For weaving a warp of 120 yards, ordinarily 20 days are necessary and the weaver is paid Rs. 7 exclusive of all other charges. Weaving charges vary according to the designs used in weaving as also the time taken to weave a given length. Generally a sum of Rs. 5 is paid for warping, sizing, winding, etc. Lungis are woven largely in Aruppukottai where there are about 1,000 looms worked by both Muhammadans and Hindus.

The most important centres of weaving in the district are Aruppukottai, Paramakudi, Rajapalaiyam and Srivilliputtur. At Rajapalaiyam in addition to the 1,000 looms which are engaged in weaving mill-made yarn there are about 100 looms engaged in weaving purely hand-spun yarn. The wages earned by khaddar weavers are comparatively higher commensurate with the trouble involved in weaving hand-spun yarn.

Ranmad to a very limited extent and Paramakudi are the only centres where silk weaving is done in this district, Paramakudi commanding the largest manufacture. China silk is obtained from Bombay. Silk obtained from China is said to be cheaper and the wastage in bleaching China silk is comparatively less than that in Kollegal silk. Twenty tolas of China silk after bleaching is said to yield 16 tolas whereas 20 tolas of Kollegal silk yield only 12 tolas. The merchants dealing in China silk at Shanghai in China have their own agents in Bombay through whom Paramakudi merchants get their supply. Silk is reeled and twisted and then bleached and dyed. All kinds of dyeing are done locally. Mostly chemical

dyes are used but also kapila, kiramanji and lac are used largely in dyeing. For dyeing one viss of silk the following charges have to be incurred :—

	RS.	A.	P.
Reeling charges	2	8	0
Twisting	2	8	0
Bleaching and dyeing with—			
Aniline dye	6	0	0
Kapilla seeds	6	0	0
Kiramanji	7	8	0
Green and rose	7	0	0

Lac gives the best deep red colour. The charges for warping a viss of silk is Rs. 1-8-0 or Rs. 2-0-0. Ordinarily a warp is 90 cubits long and this is woven into 5 sadis each 18 cubits long. To weave a sadi of 18 cubits long and 45 inches broad with designs in lace both in the body and in the border a coolie of Rs. 20 is given and the time spent on the work is 20 to 25 days, for two people working at the loom. The sarees are costly ones and are priced from Rs. 50 to Rs. 150.

The fabrics woven at Paramakudi are exported largely to various places in the Presidency the bulk of the fabrics being consumed at Chettinad only. Ramnad has only a few looms and the cloths made there being intermixed with cotton and silk yarns do not cost more than Rs. 20 or Rs. 25 and are consumed locally and in parts of Tinnevely adjoining it. All the other places engage themselves either in weaving coloured sadis of lower counts of 20s to 50s or whites from 20s and 24s. White cloths for males are generally $3\frac{3}{4}$ cubits long and 2 cubits wide and a piece of 4 cloths sells for Rs. 2. The commonest variety of sari manufactured in these places costs Rs. 2-8-0 to Rs. 3-2-0 and a weaver who is able to weave a pair in a day with a fly shuttle loom earns 12 annas wages. Better quality of sadis sell at Rs. 4-4-0 each and the economies for weaving 10 such sadis are given below :—

	RS.	A.	P.
Wages for weaving 10 sadis (90 days)	12	8	0
	RS.	A.	P.
Preparation processes—			
Warping	1	8	0
Sizing	1	8	0
Sizing material	0	10	0
Preparation of weft yarn	0	6	0
Winding charges	0	10	0
Putting on the loom	0	6	0
	<hr/>		
		5	0
Yarn required for 10 sadis—			
20s red	1	box.	
20s yellow	13	ladis.	
40s	8	..	

				RS. A. P.	
30s yellow	8 ladis.	
26s whites	2 "	
20s black	1 ladi.	
				1 box and 32 ladis	
				or 2½ boxes.	
Cost of 2½ boxes of yarn at Rs. 10 per box is	..				25 0 0
			Cost of 10 sadis	..	42 8 0

or each sadi costs Rs. 4-4-0.

The cheaper varieties of sadis manufactured at Aruppukottai, Rajapalayam, and Karaikudi are consumed to a large extent in the Chettinad and an appreciable quantity is exported to distant places like Ceylon, Straits Settlements, Penang where there are a good number of immigrant labourers from South India. The whites manufactured at Chattrapatti and Srivilliputtur are sent to Malabar where they command a good market. Emeneswaram is practically the only place where weaving of finer counts of male upper and under-wear is woven and the goods are exported largely to Tinnevely, Ramnad and Madura. The counts of yarn in use are 20s to 100s but finer counts especially 60s, 80s and 100s are consumed largely. At Emeneswaram a warp is 80 cubits long and for weaving 80 cubits the wages range from Rs. 3 to Rs. 8 according to fineness of the yarn and the quantity of lace used. The average weaver here also does not get more than Rs. 10 to Rs. 12 per month.

At Aruppukottai there are six Labbai merchants dealing in lungis and kailies and each has about 100 families of weavers working under him. The yarns in use are mainly 20s for both warp and weft. The ordinary dimensions of a piece of lungi woven here are 8 yards by 46 inches and the wages paid come to Rs. 1-6-0 including 8 annas for warping and sizing charges. A weaver can weave about 6 yards a day and earn 10 annas wages. In a week about Rs. 2,000 worth of goods are manufactured.

Trichinopoly District.

The population of the district as per last census is 1,902,838; of them 53,296 are engaged in the weaving industry. The weaving industry of this district may be roughly divided into the following classes:—

- (i) Weaving of pure silk;
- (ii) Weaving silk mixed with cotton of the Kornad pattern;
- (iii) Palakavu or coloured cloths of cheaper variety;

(iv) White cloths with lace and silk borders; and

(v) Products in coarser counts, for the use of the poorer classes.

Each kind of fabric is woven by a particular class of people. Silk-weaving is done by the Sowrashtas in Trichinopoly and Woraiyur from a very long time. There are about 500 families in Trichinopoly town and about 200 in Woraiyur with a population of 7,000 to 8,000. There are 1,500 looms at Trichinopoly and about 400 in Woraiyur employed on silk-weaving but none of them are fitted with fly-shuttle slay for the reason that they are not suitable for weaving silk threads. Raw silk is obtained from Mysore, Bengal and Japan and is sold by the Sowcars in Trichinopoly town at Rs. 20 to Rs. 25 per viss. Weavers buy their requirements for cash or credit and make silk cloths measuring 4 to 6 cubits long and 45 inches wide for consumption specially by Muhammadans. Some of the patterns are known as Hunru, Benares Gulpadan Khalidar Hafflodar, Pattnadu and Modharbhavani. The total production of silk cloths in these two places is roughly estimated at about 13 to 15 lakhs per year. The bulk of the finished articles is handed over to the Sowcars from whom supply of raw silk is obtained on credit while a portion is consumed in Trichinopoly town and the rest is exported to Madras, Ceded districts, and Chettinad. The average production per day per loom is about $2\frac{1}{2}$ yards costing Rs. 4. The weavers get a wage of 10 to 12 annas besides 6 annas earned by his family. On the whole the day's earning of a family does not exceed a rupee.

Mixed silk and cotton striped cloths.—This kind of cloth is a speciality of the Southern districts and Trichinopoly, Perambalur, Kulitalai, Lalgudi, Karur and Musiri taluks manufacture it. The workers are Telugu-speaking Padmasalis. The total number of looms in all the centres is about 500 and none of them are fitted with fly-shuttle slay. The required twisted and dyed silk is got from Kumbakonam and Negapatam and dyed yarn from Madura, by local Sowcars who sell them to the weavers. The yarn that is generally used is 24s and 30s. Ordinary cloths measuring 17 cubits long and 42 inches wide are woven except at Illupur where 12 cubits by 50 inches is the common variety. In Koimpatti, Lalapet, Kulitalai, and Puvallur, weavers receive advances of silk and yarn for a pavu and get wages at the rate of Rs. 5 on handing back the woven fabrics to the Sowcars. In other centres cloths manufactured are sold by taking them to Malabar, Tinnevely, Madura, Madras and other places. On an

average a square yard of cloth costs Rs. 2 and the weaver making these cloths earns a rupee a day with an assistant working with him.

Palakavu or coloured cloths.—This kind of cloth is woven in almost every place in the district and there is much demand for it from outside. The workers generally belong to the Devangi caste with a sprinkling of Kaikolars. These cloths are produced largely in Jayankondasholapuram of the Udayarpalayam taluk and ten villages in its vicinity where there are about 4,000 to 5,000 looms. There are also other centres in Lalgudi, Perambalur, Karur and Kulitalai taluks which have also a fairly large number of looms dealing in these fabrics. Peg warping has been completely displaced by warping mills and practically we find one warping mill for every 10 looms. In Udayarpalayam taluk looms are not fitted with fly-shuttle slay but only 40 per cent of them in the other taluks are fly-shuttle looms. The average production of a single loom is 20 cloths each costing Rs. 2-8-0 and they are sold locally in the weekly shandies and are also exported to adjoining districts.

The Jayankondasholapuram shandy is famous for trade in these fabrics and merchants coming from Tanjore and other parts bring with them yarns and exchange them for the finished products with the weavers. The price of a cloth varies from Rs. 2 to Rs. 4 according to its quality. The cloth which can be sold for Rs. 2-8-0 costs the weaver Rs. 1-14-0 leaving him about Re. 0-10-0 for his wages for 1½ days. In Turaiyur and Puvalur almost all the workers are dependent on the Sowcars.

White cloths with lace and silk borders.—This is a speciality in three places in the district, viz., Woraiyur, Turaiyur and Jayankondasholapuram, Woraiyur and Turaiyur standing foremost. The total number of looms producing this kind of cloth is about 1,200 and all of them without any exception are fitted with fly-shuttle slay. The weavers are Devangis by caste and their women and children help them in preparing warps and sizes. Those who possess lands lease them out and engage themselves wholly in weaving. The yarn required is purchased from Madura and Madras by the merchants at Trichinopoly who sell them to the local weavers. At Turaiyur and Woraiyur there are capitalists who employ workmen on wages. The cost of a fine cloth ranges from Rs. 2-1-0 to Rs. 12 according to the quality of yarn and lace used and pattern of the border adopted. The cloth without lace costs Rs. 1-10-0 to Rs. 1-14-0 and the daily output of a single loom is one cloth measuring 6 cubits by 50 inches.

These cloths are exported to Pudukotta, Ramnad, Tanjore, Tinnevely and Malabar. The earnings of a family here also do not exceed a rupee. Besides the above kind, black and red bordered white cloths woven with yarn of 40s and 60s are made at Musiri and Manamedu, Kulittalai and Jayankondasholapuram. Ordinarily boys are engaged in making them, and they weave about 15 cubits of cloth per day and earn 8 annas.

Production in coarse counts.—Duppatti, towels, bedsheets, rough cloths for lower classes are made at Illuppur, Venkatarapuram, Aravankurichi and Elavanur of Karur taluk and Pillaidurai of Musiri taluk. The weavers are Adi-Dravidas in the first three places while they are Sengunda Mudaliars in other places. At Karur, bedsheets, towels and mufflers are manufactured by four capitalists employing 400 workers working with 40 looms in their factories. They import dyed yarn from Madura and also dye locally with fugitive colours. Twisted yarns of 30s, 24s and 20s are largely in use. The labourers are paid by piecework system and they earn about 10 to 12 annas per day making 2 to 3 pairs of bedsheets at the rate of 5 annas per pair. A woman winding thread 6 lb. a day gets 4 annas and a boy who assists at the loom is paid a monthly salary of Rs. 4. The daily production of this class of goods is worth about Rs. 500. Bedsheets are made in several designs. Finished articles are exported to Trichinopoly, Salem, Tinnevely, Madura and other places in the Presidency. They have travelling agents to push up their sales but they have to face the competition from mills which can put their outturn into the market at 4 annas less than the rate charged by these people. At Elavanur weavers work individually with their families and prepare the same kinds of bedsheets, towels, etc., as those manufactured by factories. Their wages work up to 8 annas for a male and 2 annas for a female. Towels that are made here are thin and black bordered. They measure 2 cubits by $1\frac{1}{2}$ cubits and 7 pieces of 6 towels each are made out of one bundle of 20s costing Rs. 7-8-0. A towel weaver gets about Re. 0-4-6 per day. Adi-Dravidas of Illuppur and Aravankurichi make on ordinary looms duppatties and rough towels called kailees which are worn by Muhammadans. Warping is done by peg board at Illuppur but in all other places it is done by mills. The wages of these Adi-Dravida workers come to 6 annas per male and 2 annas per female. Yarn required is supplied by the Sowcars at a profit of Re. 1 per bundle of 10 lb. A weaver is able to weave 10 cubits by 45 inches of bedsheet or 12 cubits by 41 inches of kailees in a day. Woven cloth is sold in shandies and the weaver pays the Sowcar his old debt and draws a fresh supply of yarn on

credit. At one time there were about 100 families of Adi-Dravidas employed on this work but their number has dwindled down to 15 due to the mill competition. Some of these people have taken to agriculture, some to cooly work and others have migrated to Ceylon and other places in search of work.

Tinnevely District.

As an industry, handloom weaving is the mainstay of most of the people in the Tinnevely district. According to the last Census the population of the district is 1,901,396 of whom as many as 64,968 persons are weavers, the actual workers being 12,801. They belong to several castes known as Kaikolars, Sowrashttras, Adaviars, Mudaliars, Illathupillaimars or Ezuvars, Adi-Dravidas and Muhammandans. The chief weaving centres are Melapalayam, Kadayanallur, Tenkasi, Viravanallur, Kalladaikurichi, Sankaranainarkoyil, Pulliangudi and Vasudevanallur. In Sankaranainarkoyil, Pulliangudi, Vasudevanallur and Kadayanallur weaving of coarse female sadis with stripes of different colours both in the warp and in the weft which are used by the low class women of the locality or where such have migrated is the most prevalent. In Melapalayam and Kadayanallur, lunghis and kailees are the chief pattern and in Viravanallur angavastrams of yarn of higher counts which are popular with the Malayalees are woven. In Kalladaikurichi, Sankaranainarkoyil, Pulliangudi, Tenkasi and Vasudevanallur, etc., towels of short lengths and white female cloths are woven. Weaving of silk is restricted to Viravanallur where sadis with silk both in the warp and in the weft with solid borders of silk are woven. In other places like Melapalayam and Munnirpallam artificial silk is used in small quantities.

Silk weaving.—In Viravanallur there are 50 Sowrashttras whose chief occupation is the weaving of silk fabrics either wholly silk or admixed with cotton. Silk is got from Kumbakonam ready dyed. The weaver takes 12 to 15 days to weave a sadi of 18 cubits long and 45 inches wide, including the time taken for winding, warping, etc., and earns a cooly of Rs. 8 out of which is paid Re. 1-0-0 to Rs. 1-8-0 to the boy who assist him in weaving silk borders. The cost of such a sadi is Rs. 40 and they are sold locally or sent to Tinnevely cloth merchants. There are a few Sowrashttra Brahmans in Palamcottah who also weave fabrics of silk on a small scale. Veeravanallur besides producing silk cloths, also produces cotton cloths of finer variety. There are four or five looms which weave the superior variety of cloths called angavastrams or upper cloths of $7\frac{1}{2}$ to 12 feet in length woven with yarn usually of 100s and 125s. Lime water is sprinkled

over the warp while sizing. The popularity of these cloths consist in a 'V' shaped mark called 'Chutti' being woven at the ends embroidered with lace which the Malayalees in particular seem to have a fancy for. In fact, these cloths are marketed only to Calicut, Malabar and Travancore where they are said to command good sales. A warp for this kind of fabric is generally of 60 feet long and one man takes 3 to 5 days to weave it. A cooly of Rs. 6 is paid for weaving. The financial aspect of the industry is—

	RS.	A.	P.
10½ ladis of 100s at Rs. 16-4-0 per bundle of 25 ladis	6	13	0
Winding, warping and sizing	1	14	0
Cooly for weaving	6	0	0
Special coolie for working chuttis at 4 annas per cloth.	2	0	0
Total ..	16	11	0

Eight cloths are manufactured from the above and they are sold for Rs. 22-8-0. Net gain is Rs. 5-13-0. There are 2,500 looms in the village of which only 7 or 8 are fitted with fly-shuttle slay.

Cotton weaving.—The bulk of the weaving in the district is only of cotton yarn. There are three important spinning mills in Papanasam, Tuticorin and Koilpatti which supply the requirements of the weavers. To a limited extent yarn also is obtained from Madura. The purchase of yarn is mostly on credit in which case a charge of 4 to 8 annas and sometimes even Re. 1 in excess of the market rate is charged by the dealers. The number of looms in this district are 22,268 all using mill spun yarn and the counts of yarn in use are 20s, 22s, 24s, 26s, 30s, 40s, 60s, 80s, 100s and 125s, but the use of the higher counts of yarn is very much limited. Kaikolars or the Sengunda Mudaliyars are the class of people who do coarse weaving from time immemorial. Dyeing is not done locally but dyed yarn is obtained from Madura. Winding is done by the womenfolk. There are warping mills at the rate of one for every 10 houses. Sizing is done as elsewhere in streets and warp of lengths as long as 190 yards is adopted. About 15 to 20 persons are required for sizing a warp but the work is done by exchange of services among the weavers. These coarse fabrics are suited to the tastes of Adi-Dravida women of the district and to those who have migrated to Ceylon, Penang, Singapore and other places. The cloths are usually 13 cubits long and 45 inches to 50 inches wide and each cloth is sold for

Rs. 2-12-0. For a warp which will suffice for 20 female cloths 5 bundles of yarn are necessary. The economics of the industry are as under :—

	RS.	A.	P.
Cost of 5 bundles of yarn of 40s at Rs. 8 per box ..	40	0	0
Winding charges	1	9	0
Warping charges	1	0	0
Cost of sizing material	1	0	0
Cooly for 15 men and one woman to pour the size ..	2	0	0
Gum $\frac{1}{4}$ tulam for giving toughness and smart appearance	0	12	0
Total ..	46	5	0

Twenty female cloths of 13 cubits each are woven out of this and they are sold at Rs. 2-12-0 each.

Total value of cloths manufactured when sold, Rs. 55.

Profit of the weaver is, Rs. 8-11-0.

The weaver takes 25 days to earn this amount at the rate of 2 days for winding, 2 days for warping, 1 day for sizing and 20 days for weaving at one sadi per day. Thus the monthly earning of a weaver works up to Rs. 10-7-0.

In Puliangudi of Sankaranayinarkoyil taluk, towels of 3 cubits long and $1\frac{1}{2}$ cubits wide which are very popular with Malayalees are woven. Long warps of 126 yards are taken in two sets in one continuation. Yarns of 20s are used for these towels and 4 bundles of yarn are enough to give a warp of the required length. This will give 7 pieces of 24 towels each. There are 285 looms at Puliangudi all fitted with fly-shuttle slay producing these fabrics.

The largest weaving centre is Melapalayam where there are 4,000 families of Muhammadans engaged in this industry. About a thousand of them have got lands but most of them have leased their lands and taken to weaving. There are about 8,000 looms in the village most of them fitted with fly-shuttle slay. Female cloths of various colours and stripes, white male cloths and foremost of all lunghis of different varieties are the chief patterns woven here. Cotton is mostly in use and mercerised yarn both white and coloured of counts 244s, 254s, and 284s are also employed. Both real and artificial silk, the latter to greater extent, is employed in weaving lunghis. Another peculiar pattern known as " Madras Handkerchief " $2\frac{1}{2}$ feet square with different colours and stripes is also woven. Fabrics known as lunghis and kailees are woven in largest quantities with a narrow width of 2 feet to 2 feet 2 inches having a border only on one side. These are coupled

together in pairs by stitching the two pieces at the borderless edge so as to give a double breadth. Weavers say that weaving in two parts and stitching them together is advantageous to wearing the apparel either ways. Shirting cloths are also done with stripes of different colours but its use is very much limited. White male cloths and some striped fabrics find a local market but most of the coloured and striped fabrics and all the lunghis find markets at Ceylon, Rangoon, Penang, Singapore, and Travancore, besides some of them being sent to the adjoining districts. The Singhalese of Ceylon are said to patronise the cheap variety of lunghis sent from here which are used as underwear over which they tie their costly cloths. The underwear is never washed but cast away when it gets dirty. This habit on the part of the Singhalese seems to have created a large demand for the cheap variety. They are shipped from Melapalayam twice a week on Mondays and Thursdays, the average shipment being about 30 bundles of 300 to 400 lunghis each. The annual output of cloth at Melapalayam is worth about Rs. 15 lakhs. It is said that this market is being threatened by similar cheaper fabrics coming from England and elsewhere competing with them. In 1922 an Association by name "Melapalayam Muslim Association" was formed with 10,000 members with its headquarters at Melapalayam. They employed an agent and opened a store in Colombo. The finished products were purchased from the members of the society for cash and despatched to the Colombo stores where the Agent effected sales. But this association was short lived. It aroused the jealousy and rivalry of the local merchants who were till then monopolising the trade at Colombo and who began to undersell their wares. Though they themselves suffered loss, their objective was gained and the association broke up in 18 months. Now the weavers are as before at the mercy of the local merchants. In this centre Japan yarn is extensively used for weaving lunghis. Special preference to Japan yarn is said to be due to its being uniform and free from knot and grit. A bundle of 10 lb. of 40s or 60s is said to give a greater length than that got from English yarn. A warp of 500 feet long and 32 inches wide consuming 2 bundles of 40s or 60s is woven in 33 days and the wage paid is Rs. 22-8-0; the average being 11 annas per day.

The nature of implements used is almost the same as elsewhere and the looms are pit-looms except in the "Goldwin Cottage Industry" where all the looms are frame looms. The workmen are following primitive method of sizing without any improvement whatsoever. The weavers in all the centres work by themselves from 8 to 10 hours a day and on an average they earn a cooly

of 5 annas to 8 annas. They are assisted by their family members but with all that they are not able to earn a living wage.

From a survey of the four districts it is observed that the condition of the weavers is more or less the same everywhere. They are as a class poor and possess no property except a small poor dwelling which more often than not is encumbered. They are mostly ignorant barring a section of the Sowrashtas of Madura City and are by habit addicted to drink evil. They mainly depend upon their employers who are mostly their own castemen for living and they borrow from them on occasions of marriage, births and deaths. The latter taking advantage of their helpless condition exploit them. The wages earned by the family of a weaver do not exceed 8 annas a day in most cases, making allowance for non-working days. There are, however, a comparatively few cases in which wages of 12 annas or Re. 1 are earned in a day. The workers in finer counts and lace generally earn more than an ordinary weaver and also those employed in factories, where they are made to work under discipline. Persons working with fly shuttles can earn better wages; but though this fact is patent the weavers are not forward in introducing fly shuttles to a larger extent, though in this respect they are far better than their brethren in the Ceded Districts. The reasons urged by them being that there will be greater production than they could market with advantage. Some of them gave it as their experience that they had to revert to the handloom when they found the production too large to be marketed. It is difficult to make these ignorant people understand the law of supply and demand and only education can weed out such ideas from their minds.

In this age of keen competition, the chief aim or object of the weavers should be to reduce the cost of production as far as possible to create a steady demand for their wares and for this purpose they must adopt labour saving appliances such as the use of a larger percentage of fly shuttles and of sizing machines wherever it could be done without retrenching aggregate earnings of a family. As to how these defects could be removed and the general condition of the weaver improved by making him more self-reliant and better organised and how far markets could be found for his manufactures are matters of general importance presenting themselves for solution in every district of the Presidency. The general outline of the suggestions that might be made has already been drawn and it seems better to defer the reiteration of these suggestions or suggest any modification until the survey of the whole Presidency is finished.

Dyeing and Printing Industry.

Madura is one of the largest centres of dyeing in Southern India and has acquired a fame for its fine and fast dyeing, especially in red and dark red. There are a number of regular dye houses, large and small, engaged in dyeing apart from individual dyers who carry on the industry in their homes and who number about 2,000. The water of the Vaigai river is said to be specially adapted for dyeing and recognised as it is, that water plays no mean part in the art of dyeing, the superiority claimed may not be altogether baseless. At one time, Madura used vegetable dyes of local manufacture far more extensively than at the present day and the Town was famous for the preparation of a purely vegetable deep red dye, but now such a complete change has been brought about by the importation of cheap mineral and other foreign dyes that the dyer has wholly abandoned vegetable dye except in the way of using kasa leaves (*memicylon-tinctorium*) as a mordant to dye cotton stuff with alizarine red. The dyes used are mostly of German origin and only a small proportion of the imported dyes comes from England and other countries. The German dye Syndicate "I. B. Ferhen Industrie" has its sole representative in India in the Havere Trading Co., Ltd., and the latter's Agents 2 or 3 in number, supply the needs of the dyers in the district which are by no means small. The quantity of yarn dyed in Madura amounts to hundreds of bales per month and is, besides being locally consumed, exported to the adjoining districts of Ramnad, Tinnevely, Trichinopoly, etc., for use by the weavers there.

The main dye stuffs used are Nephthol, alizarine red, Indenthrene blue and other vat and aniline dyes. The colours used in dyeing are the following:—(1) Direct colours, (2) Basic colours, (3) Vat colours, (4) Sulphur colours and (5) Acid colours. The methods adopted in dyeing depend on the kind of dye stuff employed which again depends upon the style of goods produced and variety of fibres used. First in importance taken according to the bulk treated comes grey cotton, next mercerised cotton, then silk and lastly artificial silk. The styles of goods manufactured are sarees with and without gold thread, dhoties silk-bordered with or without gold thread, turbans with gold thread, sarees and dhoties with mercerised yarn, sarees and dhoties of mercerised yarn with art silk used chiefly for weft and silk sarees with silk both in warp and in weft. The most important dye used in cotton dyeing is blue. A very deep bright blue is obtained from Indenthrene blue R.S.D.P. This colour is one of the best blue colours known and it answers the purpose for which it is

employed, exceedingly well. Dyeing 5 lb. of yarn with Indenthrene blue costs Rs. 3-8-0 and it is very much cheaper than dyeing with vegetable indigo. Sulphur black is now largely used in dyeing black owing to its cheapness. Dyeing 10 lb. of 20s. with it costs only 8 annas but this has the dulling effect in the border of the sarees containing gold thread probably due to the minute traces of sulphur of the dye combining with the silver of the gold thread and forming silver-sulphide. Dyeing a bundle of yarn with nephthol colour costs Rs. 2 to Rs. 2-4-0.

Till a few years ago, alizarine paste was largely used in obtaining red colours but recently due to competition, nephthol red is coming into prominence, but in the majority of cotton sarees manufactured for the poorer classes of women who work in fields, alizarine red is preferred. Chrome yellow and chrome orange are used for yellow and orange colours. The same colours are used for dyeing mercerised cotton, while those used for art silk are mostly red, blue, yellow, orange and green, but the dyes used for the latter are very cheap and fugitive and the main difficulty in using better dyes is its delicate nature. The colours used in silk are blue, red, green, black, yellow, and pink and are mainly basic acid and direct. In some places, they use lac; though dull, it is very fast.

Besides yarn dyeing on a large scale, there are two varieties of dyed cloth manufactured in Madura town which are greatly in demand and largely exported to the various parts of Southern India, viz., "Sungadi sarees" for women and "Saya vaishti" for men. The process employed in dyeing these cloths is laborious and crude. Pieces of cloth produced on handlooms or mull pieces (foreign) are first dipped into an emulsion of groundnut oil and alkaline earth and treaded under foot for a number of times (sixty is said to be the number) and allowed to remain wet for two or three days. Afterwards they are taken to the river, washed and hung up on bamboo poles for drying in the sun. This process is repeated for at least a week and at the end of it they are washed in the river and put in the dyeing vat containing a solution of alizarine red and kasa leaves. After the cloth takes the dye it is steamed and dried. The wages for treading are As. 1-6 for 15 sarees. For sungadi sarees, knots are tied by girls and women of Sowrashtra caste, rich and poor alike, at one anna per 1,000 knots. They are tied along the lines marked in the cloth with red pigment according to the number required by the dyer for a square block. The women have acquired such skill in the work that they can with ease finish 1,000 to 1,500 knots per day. This is a common sight to see in Madura and a person passing

through the streets inhabited by this class of people cannot fail to observe the dexterous manipulation of the hand at work. The workers have to provide their own thread for the purpose. When the cloths are put in the vat the knots prevent the colours from going on the yarn and the knotted portions remain white appearing as white specks on a coloured ground. The male cloths are not completely dyed but have a white space in the middle. The portions which do not require dyeing are firmly tied with a string so that colours may not act upon the tied portions when put in the vat. The process of knotting cannot but be regarded as a rude one. Stamping the cloth with wax spots as it is done elsewhere, can be a suitable substitute.

In Madura town a few persons practise the art of wax printing and in Uttamapalayam there are four houses which do this work. The art consists in printing designs in wax with wooden blocks on the cloth previously dipped in myrabolam solution and dried, and immersing it in the dye tub. The design protected by wax remains unchanged while the border of the cloth takes the dye. The wax is then melted off by plunging the fabric into hot water and the design appears white on a coloured ground. The charge for printing a cloth of 20 cubits long and $2\frac{3}{4}$ cubits wide is Rupees 3 and the printer earns wages of 12 annas to Re. 1 per day when engaged on the work.

Rannad and Trichinopoly districts depend upon Madura for their supply of dyed yarns.

Tinnevelly District.

Dyeing as an independent industry is to be found in Melapalayam and Kilaviraraghavapuram. There are seven important dyeing houses besides 35 yarn merchants who dye their own yarn. Indigenous dyes are never used but only dyes imported from America are in use. Congo, black, yellow, dark red, blue, green, blue-black and brown are the colours in use. Scarlet and blue-black are fast while the other colours are fugitive. The dyers keep the proportions of the mixtures they use as a secret, but the ingredients generally used for fast colour of nephthol red are :

(a)	Nephthol soap	..	..	..	$\frac{1}{2}$ rathal.
	Caustic soda	..	..	..	9 tolas.
	Nephthol A.S.B.S.	..	..	..	$\frac{3}{8}$ rathal.
	„ A.S.	..	..	..	3 tolas.
	Formaldehyde	..	..	..	9 tolas.
(b)	R Salt	..	..	..	$1\frac{1}{8}$ rathals.
	C. Salt	..	..	..	3 tolas.
	Common salt	..	..	..	$\frac{3}{4}$ rathal.

The first set (a) is mixed and boiled and when cooled formaldehyde is added. The second set (b) is mixed with water and kept separate. The quantity shown above will suffice for dyeing three bundles of yarn with Congo red. Before dyeing, a bundle of yarn is washed in the flowing water of the Tambraparni river and gathered on a slab and beaten by two persons with wooden bats. It is taken home and ringed out and then given a cold bath successively in a solution of one tola of aniline dye and mixtures (a) and (b) and thereafter boiled over an oven with nine tolas of the dye mixed with the required quantity of water and turned round with a stick while boiling, so that all parts of the yarn might take in the dye uniformly.

For buffalo black, acid green, alkali blue, pale-yellow and gumoline yellow mordants are prepared with ten tolas of myrabolam powder in two pints of water for each bundle of yarn. The yarn is first dipped into this, stirred well and squeezed. Then a further bath is given in a solution of five tolas of Indumani salt in two pints of water. The yarn will then be ready for dyeing, and is put in dyeing vats of the colour required. These processes give only temporary hues. For fast colour the yarn is moistened as usual and treated in a solution of alkaline earth in water to which turkey red oil is added at the rate of $\frac{1}{2}$ oz. for three knots. An emulsion is formed and the yarn is bathed in it.

For fast black colour half the usual quantity of Congo red is used and the yarn dipped in it first. Twenty tolas of Glanber's salt is mixed in about three pots of water and boiled. Half an ounce of sulphuric acid is also added to it. The yarn is treated in this solution and then washed in cold water.

There is a dyeing house by name "Vaikuntam Pillai & Co." in Kilaviraraghavapuram which does dyeing on a large scale. It has 19 indigo vats of which ten are in use. For indigo colouring some quantity of wild indigo seeds boiled and baked are put into the vats along with synthetic indigo. The addition of this is said to impart glaze. Vegetable indigo has gone out of use after the advent of the cheap German dyes though the common belief still is that the colour obtained with vegetable indigo is superior. But the use of vegetable indigo involves more labour and trouble and is not therefore popular.

During the war when foreign dyes could not be had another crude and cheap process was adopted for dyeing black. Rusted iron pieces are put in a pot of water in which are mixed palmyra jaggery and ragi gruel and kept for over a week. The yarn is dipped first in a solution of myrabolam and then in the above mixture when black colour is got. But this method of dyeing

black has almost been given up since the market has again been flooded with foreign dyes after the war. The colour obtained with this is not so fast and the yarn also becomes weak.

In a dyeing house the dyer gets only coolie for the work he does. The master dyer supplies him with all the dyes which he purchases from the local shops. The average coolie earned by a dyer ranges from 4 annas to 8 annas per bundle. The quality of dyeing is admittedly inferior to Madura. Some of the important weavers therefore get their supplies of yarn direct from Madura, though the yarn of the same colour is available locally and also at cheaper rates. The dyers, though they have blindly learnt the art from the dyeing agents who diffuse such knowledge as they can, are not able to make any intelligent application.

Though Madura town is the biggest centre for dyeing in this group, many of the dyers carry on their occupation in their old fashion. Barring one or two big dye-houses which have a master-dyer possessing some scientific knowledge the rest follow the method which they have learnt from the travelling agents of dye-firms and claim superiority in dyeing over their next-door neighbours, each man claiming a speciality for his mordant. Even in organized dye-houses, modern appliances such as hydro-extractors, steaming, ringing and mangling plants are not in use, and consequently a high degree of uniformity in dyeing various fabrics cannot be secured and the cost of labour reduced. Water is an indispensable agent in dyeing and a knowledge of its analysis is beneficial. In fact, scientific knowledge and methods should be introduced, and for this purpose a school of dyeing which can impart technical knowledge to the people is a desideratum. Until such a school is established, an itinerating demonstrator who can teach them the technique of dyeing at their very doors is necessary. The half knowledge that they now acquire from the travelling agents and their anxiety to keep down the cost of dyeing without any regard to the maintenance of a satisfactory quality are likely to harm the development of the industry.

Wool—Spinning and Weaving.

Trichinopoly District.

The next common industry which arrests the attention of a surveyor of industries is the woollen blanket making. It is usually to be seen in tracts where large flocks of sheep are reared. Such a zone is the northern portion of the Perambalore Taluk and a part of the Musiri Taluk, but in the latter wool is not spun but sold to Perambalore shepherds. In Perambalore and villages round it there are 30 to 40 thousand sheep reared mainly for manuring lands and for sale in the shandies. The only places

where there is wool spinning are Pasambalur and Kallakampatti, $4\frac{1}{2}$ miles from Puttanattam in the Kulitalai Taluk and the adjoining villages of the Perambalore Taluk. The wool is shorn twice a year, once in December and a second time in August. The staple is short being 2 inches in length. In Pasambalur side, the winter wool is found better in quality and quantity than the wool shorn in summer. For every sheep, the annual yield is 1 to $1\frac{1}{2}$ seers (1 seer is equal to 24 rupees weight). The cost of 1 maund of shorn wool is Rs. 8. It was worth about Rs. 2 some 10 years back. No dead wool is used. The sheep are all black and dark brown and hence there is only one natural colour for the blankets made in Pasambalur. The shorn wool is first cleared of all dust and made into a nice mass and carded. The yarn is spun by women out of this mass with an iron spindle that is drawn on the lap for about 2 hours in the morning and 2 in the evening. The weight of the yarn spun in a day by a single shepherdess is about 3 seers. The threads are warped and sized with tamarind seed paste, and woven on a loom quite primitive in kind. The entire work except shearing is done by the women. The kambli's woven are generally 6 cubits by $1\frac{1}{2}$ cubits. Two such are attached lengthwise by wool string to make a covering or a spreading blanket. A whole kambli is done by a woman in a week and costs Rs. 2-11-0, while it is sold for Rs. 3-8-0 leaving a margin of 13 annas which represents the wages earned for a week. Other people who cannot weave give wool at the rate of 4 viss for a kambli costing Rs. 3-8-0 with no separate charge for weaving. This work is done only for 4 months in the year (i.e.) from February to May or June, as a subsidiary occupation. At other times they work in the fields. The blankets are sold locally in the shandies and in the surrounding taluks of the district. Pudukotta merchants buy and export them to Ceylon. Every year the whole production is sold away at the end of the season in the villages only. About Rs. 12,000 worth of blankets are produced in all the 10 villages of Perambalore Taluk.

At Ranjanagudidurgam, hamlet of Tevaiyur, woollen carpets are made by a few families. The workmen are cultivators who engage themselves in the work when they have no work in the fields. There are 6 vertical looms in this village and about 30 people are engaged in this industry. They purchase woollen threads from Kurubas and the women make them into twisted yarn with a single spindle wheel. The males weave the carpets. The working at the loom is a very tedious process; two people sit at the loom, each passing the woof thread from each side to the middle and handing it over to the other, who passes it on to the end. The two threads are pressed against the 'fell' by blows with

a toothed iron handle resembling a comb. The warp is of strong twisted four count yarn while the woof is twisted woollen thread. The woof thread which covers the warp gives the appearance of all wool carpet except at the ends where the cotton yarn is seen. The thickness of a carpet is from $\frac{1}{3}$ to $\frac{1}{2}$ inch. A carpet 6 feet by 3 feet weighs 10 seers, the yarn in it weighing $2\frac{1}{2}$ seers and the wool $7\frac{1}{2}$ seers. A carpet is made by a worker with an assistant in seven days working at the rate of two hours a day. Coimbatore mill yarn is purchased in shops in Trichinopoly at Rs. 6 per bundle of 10 lb. containing 20 skeins. One bundle is used for six carpets. Wool is purchased at 5 annas a seer. A carpet sells at Rs. 4-8-0 or Rs. 5.

					RS.	A.	P.
Cost of the yarn	..	..	...	..	1	0	0
wool	..	..	..	..	2	8	0
Winding, twisting, warping and sizing	..			..	0	6	0
					<hr/>	<hr/>	<hr/>
					3	14	0

There is thus an earning of 10 annas to Re. 1 per week. The carpets are sold in Pasambalur and adjoining towns but a wider advertisement of them might make them more popular. About 200 carpets are produced in a year working for only six months when wool is available. This village was once well-known for its cotton carpets but that industry has now disappeared before the cheap and more artistic Bhavani carpets.

Madura District.

In a few villages of Palni, Uttamapalayam and Nilakotta taluks the blanket industry is carried on by a class of people called 'Kurumbar' who belong to the class of shepherds. Their main profession is the tending of flocks. There are a few thousand sheep in the area and the flock is tended more for the purpose of flesh than for the wool. Generally the wool is cut twice a year as in Bellary and other places once in July and again in January. Sheared wool is spun by a spindle and woven into blankets and sold locally. Generally the people of the place do not go in for more wool than is available in their villages as they do not engage themselves wholly in blanket manufacture. They use only live wool sheared from the sheep. The process of shearing is the same as that prevalent in Bellary. The sheep are well cleaned before shearing is done and Kurumbar themselves do the work but do not engage any cooly for they help one another. Here the staple of wool is about 2 inches. A man can shear about 20 sheep in a day and the wool sheared from 20 sheep is sold for Rs. 3 to Rs. 3-4-0 and can be converted into three half sheets of 6 cubits by

1½ cubits. Two such half sheets form one blanket or kambli. The wool required for weaving a half sheet weighs about 60 tolas or 1½ lb. The yarn required for a kambli of 6 cubits by 3 cubits, i.e., two half sheets can be spun in 20 days and weaving is done in two days. Tamarind starch is used for warping as in other places. A sum of 4 annas is paid for warping, sizing and putting on the looms and the wages paid for weaving the two half sheets is only 8 annas. A kambli of the above description is sold for Rs. 3 to Rs. 3-8-0.

Very little attention is paid to this industry in this group of districts. Sheep are not carefully tended nor are they of good breed. The shepherds who speak corrupt Kanarese are probably migrants from the Coimbatore and Mysore plateaus and have forgotten their skill in turning wool to their advantage. The whole work is entrusted to women who do it only when they have to find some money for sundry expenses; otherwise they are engaged in agriculture and make a living out of their earning from the sale of sheep for the table. The kind of wares they produce are coarse and rough and have no finish in them. They are useful as rough warm wear by the agricultural classes in the winter season. The shepherds do not show any keen interest in improving and expanding this industry and they have very little hereditary skill in them.

Kora Mat Industry.

In this group of districts, Trichinopoly is the most favoured district for the growth of the industry known as kora mat-making. Next to it comes the Tinnevely district. The localisation of this industry in these districts is obviously due to the natural growth of kora grass in the beds and padugais of the Cauveri river and along the banks of the Tambraparani and its channels and also to the existence of a large sect of Muhammadans known as Rowthans whose women find an admirable indoor occupation in it. Madura and Ramnad have also fostered this industry on a small scale in a few scattered villages of Palni, Melur and Srivilliputtur taluks. Herein also, the Muhammadan Rowthans have contributed to its growth.

In the Trichinopoly district the industry has developed so considerably, that the makers do not depend as in the Tinnevely district on the wild growth of korai but grow it as a commercial crop on patta lands in padugais and use it for their manufacture while exporting a large quantity to Madura, Tinnevely and other districts. Korai when once raised stands on the land for about five years and yields a crop worth Rs. 300 a year per acre, the cost of cultivation and maintenance charges during this period

coming to Rs. 500. The owner of the land is paid an annual rent of Rs. 100 per acre, so that the grower of the crop makes a net income of Rs. 100 per annum which compares most favourably with the return derived from agricultural lands. In other districts, where it is grown in a wild state on the banks of rivers, channels and tank-beds the right to cut the grass is sold by Government and purchased by dealers in korai who cut and stock it for retail sale. One of such centres is Pettai from which the petty workers draw their supply. In Madura and Ramnad the workers who are solely Muhammadan Rowthans get their korai from Dharapuram, Pol-lachi and Karur taluks of the Coimbatore and Trichinopoly districts and from dealers who visit these centres with cart-loads of grass. The korai is not sold anywhere in this group of districts by weight but sold only by volume and the workers are intuitively capable of sizing bundles uniformly of equal weights. The korai in these bundles is, however, not of uniform length and the purchasers have to assort them according to the quality for use in mats of varying widths. The price of korai varies with the fineness and length of the reed and also the distance to which it is taken for sale. Where the korai is short, it is used in betel gardens specially in Ramnad for tying betel vines to the plants grown to support them. Ordinarily the price of korai varies from Rs. 2 to Rs. 2-8-0 for 25 lb. in the districts of Ramnad and Madura which get it from abroad while in Trichinopoly it is obtained a little cheaper. At some places in the Tinnevely district where it is removed free, Adi-Dravida women sell a bundle of 25 lb. for Re. 1.

Treatment.—The kora is cut when it is green and split into vertical fibres removing the pith contained therein, and dried. It shrinks in size while drying and assumes a glossy appearance. In Pattamadai where mats of superfine quality are manufactured, the treatment given to the reeds is of a special nature. The reeds are tied in small bundles and dried in the sun for 25 to 30 days, when they lose their greenish tint and assume a yellowish colour. They are soaked for four or five days in the running water in small quantities with weights placed on them so that they may not be washed away by the stream. Scrupulous care is taken to see that every part of the reed is properly cleaned. On the fifth day they are brought home and split into finer strands, after the marrow is removed, according to the quality of the mat for which they are intended to be used.

The warp ordinarily used for the manufacturing of mats is aloe fibre, except for the finer variety of mats made in Pattamadai where cotton yarn is used. Aloe fibre is mostly sold by

Adi-Dravidas who bring aloe from hedges and extract fibre therefrom. In big centres like Madura, Tinnevely and Trichinopoly it is sold in the market. Ramnad gets its supply from Madura. The value of fibre required for a warp of an ordinary mat of $6' \times 3'$ is about one anna.

In all centres except at Pattamadai coarser varieties of mats are woven. Mostly women are employed on the work, the males carrying on out-door occupations. The average outturn including the preparation of the warp is a single mat of $5\frac{1}{2}' \times 2\frac{1}{2}'$ or $3'$ costing about 5 to 8 annas and mats of higher value costing 10 annas to Re. 1 with coloured stripes at either ends and occasionally with designs in the centre are also manufactured. The net earnings of a woman average from 2 annas to 4 annas according to the quality of the work done and the time spent on it. In the Madura and Ramnad districts this industry is solely a subsidiary occupation while in parts of Tinnevely and Trichinopoly it is the sole occupation of the makers.

The chief centres for mat-making are Pugalur, Nanniyur, Wangal, Nerur, in the Karur taluk, Unniyur and Varadarajapuram in the Musiri taluk, Mayanur, Katalai in the Kulitalai taluk, Pettavaithalai, Palakarai, or Trichinopoly town in the Trichinopoly taluk and Vathalai and Talakudi in the Lalgudi taluk. There are also other places on either bank of the Cauvery where mats are made on a small scale.

Unniyur has the largest number of mat-making looms having about 300 of them. In Pettavaithalai there are about 100 looms and Talakudi and Vathalai have got about 75 and 50 looms respectively. The other places have got about 10 to 30 looms each. There are on the whole about 700 looms for mat-making in the Trichinopoly district including about 80 to 100 in Palakarai of Trichinopoly town where Muhammadan women weave mats in their houses. The mat-makers generally belong to the Guhavellala caste or the boatman caste though other castes such as Muttaracha Mudaliar, etc., have also taken to mat-making as an occupation in some centres. Both males and females make ordinary mats and mats with designs also in scarlet and green colours. The loom is of the same kind as used in the Ceded districts. The threads for the warp are prepared by the females who extract fibre from aloe plants. The extracted fibre is twisted with an iron spindle on the lap by the womenfolk of the makers. Where fibre cannot be got in this manner, it is purchased in the market at the rate of 6 annas per viss.

In Vathalai a family of mat-makers who for a day can make a mat worth about 14 annas or two smaller mats worth about that sum earn a wage of $6\frac{1}{2}$ annas. At Unniyur, the earnings of a family

per day are about $7\frac{1}{2}$ annas. At Talakudi, mats of a superior sort cost on an average Re. 1 each, but the cost of korai is greater and the margin of wages is the same here also. The korai for Talakudi mats is got from Vaidyanathapuram in the Tanjore district. In Pugalur, of Karur taluk, and Varadarajapuram and Unniyur mats with complicated designs are made for marriages. They cost from Rs. 4 to Rs. 12. They measure 6 feet by $4\frac{1}{2}$ feet. In Katalai mats of 34 feet long and $3\frac{1}{2}$ feet broad are made for use in Pudukotta and other places. These take a longer time to make and the wages after deducting cost of korai, etc., come to 5 annas for a male and 2 annas for a female.

Tinnevely District.

The chief centres of mat-weaving are Pettai, Veeravanallur, Kayattar, Alwarkurichi, Ayyanaruttu, Kalakkad, Visvanathaperai, Palamcottah and Pattamadai. In all places except Veeravanallur and Pattamadai, the mats woven are very rough and useful for spreading purposes only. But these mats alone are turned out on a large scale. The industry is pursued in some places merely as a subsidiary occupation while in others as primary occupation, the workers depending solely upon it for their livelihood. But in Veeravanallur and Pattamadai it is pursued as a primary occupation. The korai for rough mats is purchased at 8 to 12 annas per bundle weighing 80 palams or 480 tolas.

The fineness of the mats will depend upon the number of strands taken out of each korai and this again depends upon the quality of the reeds. Some korais such as those grown in the Sivagiri Zamin are too soft and are unfit for finer matting. Usually one woman will finish one mat of the coarser variety in a day and this includes the preparation of the warp also. Mats are woven in different sizes depending upon the length of the korai available but they are usually $5\frac{1}{2}$ to 6 feet long and 3 feet to 3 feet 2 inches broad. Mats of ordinary quality are sold from 4 to 6 annas. To give an attractive appearance some of the reeds are coloured with aniline dyes of dark red and green. There is a variety of mats called marriage mats which only consist of a profusion of coloured reeds. These mats have seasonal sales during the marriage season as according to the custom of the country two mats have to be purchased during each marriage. Each mat costs from 12 annas to Re. 1.

Most of the mats find local sales as they are widely used for spreading. Some are exported to foreign places such as Rangoon, Ceylon, Madras, Madura, Virudunagar and other places. To speak

only of one place, Kayattar, as much as four cartloads of 500 mats each are produced in a month and most of these are intended for foreign markets.

In some places like Pettai, Harikesanallur, etc., there are agents who segregate all the available mats in the surrounding locality and export them. When the mats are sold to these local agents, they are sold 1 or 2 annas less than the market price. These agents sometimes make advances of small sums ranging from Rs. 2 to Rs. 5 to these weavers so that the mats may be handed over to them.

By far the superior and superfine variety of mats is woven only in Pattamadai, a village in the Ambasamudram taluk on the banks of the Tambraparni. There are thirty houses of Labbais who are the priestly class among Muhammadans and they have weaving of superfine mats as their primary occupation. Unlike in other places men also help the women in the work, though it is generally the women that weave. Men get the korai, slice, size and do all other things. The korai required for these mats is grown on the banks and on the beds of the Tambraparni in the section $1\frac{1}{2}$ miles west of Karungadu and $3\frac{1}{2}$ miles east of it, the whole length being 5 miles. This section lies in Tinnevely taluk. The right to cut the korai in the whole of the taluk is leased out annually for Rs. 1,500 to Rs. 2,000 and sowcars of Pettai usually take it on lease. They get the korai cut and stock it. Pattamadai weavers get their korai from these people paying a sum of Rs. 11 for one 'semai' which consists of ten bundles and subject it to further treatment as explained above. It is usual to describe the nicety of the mat in terms of counts depending upon the number of warp threads per span of the warp. For solid effects in the mats coloured strands are used. Dark, red and green are the most popular colours. For dark red, a leaf called Kayali which is obtained of merchants who hawk it in the village and 'Sapangu' a kind of tree bark which is got from Travancore and Ceylon are powdered separately and mixed. The splits are spread and the powder is sprinkled over them to a thickness of quarter of an inch. The whole thing is rolled into a bundle and dipped in a pot of water and is kept in the sun for about six days. If the sun is not severe it is kept on even for ten or twelve days, when the strips will assume dark red colour. For green, synthetic dyes are used.

For Pattamadai mats the warp is of yarn. It is usually of high counts and bought from Veeravanallur, a village 10 miles off. For mats of 140 and 130 counts, the yarn used is 100s; for 120 and 100, the yarn is 80s and for 90, 80, and 70, the yarn used is of 70s.

Economically, however, the weaving of mats of high counts is not very profitable to the worker. It takes 20 to 50 days to weave one mat with the assistance of four or five people.

RS. A. P.

Financial aspect—

One semai (10 bundles) of reeds costs Rs. 11.				
Wastage in removing worn-out and soiled korais is 2 bundles. Again during drying it breaks and wastage under this head is 1 bundle. Three bundles go off out of ten. There are therefore 7 bundles alone available for splitting. One bundle is required for one mat. Its cost at Rs. 11 for seven bundles is	..	..	..	1 9 0
Cost of dyes and fuel	..	..	..	0 4 0
Cost of yarn	..	..	..	1 0 0
Silk for stitching the selvages	..	..	..	0 4 0
				<hr/>
Total	..			3 1 0
				<hr/>

The price fetched for a mat of 140 counts is Rs. 25. Thus the net gain is Rs. 21-15-0. This is earned by four persons in twenty days. So the earning of each per day is only 4 annas, on an average. Weaving coarse mats is more paying than the weaving of nice mats but the Labbais who claim special merit in the weaving of superfine mats do not want to climb down to the level of others. To add to this, these mats by their very quality and fineness do not find ready sales. The weavers gather the mats and hawk them about in the surrounding villages. Sometimes they get orders from European tourists and rich zamindars who use them for wall hangings and bed spreads. Thus the mats of this village have earned gold medals in exhibitions.

Market.—There is a ready market in Madura and Ramnad for the mats produced in this group of districts. The large concourse of pilgrims that visit the districts purchase them readily. The Madras market also draws a part of its supply from Tinnevely and Trichinopoly and thousands of mats are sold there. There are about 700 looms in the Trichinopoly district and about Rs. 3,00,000 worth of mats are produced annually. A large quantity of them is sold away in the shandies and the remainder is purchased by traders in Trichinopoly who export them to Madras and other districts. They find their way also to Rangoon and Ceylon. In some places, like Pettai, Harikesanallur, there are agents who collect mats from the surrounding villages and export them. They are able to get them 1 or 2 annas cheaper as they purchase in large numbers and sometimes make small advances of Rs. 2 to Rs. 5 to secure their order.

This is the only industry that is not sowcar-ridden. Each mat-maker is independent and is free to make his profit which in spite of the greatest exertion is not much considering the high price of korai. If the mat-maker grows his own korai, it will be greatly advantageous to him but he is always poor and landless. The lands on which korai is grown are generally in the possession of landlords who are not mat-makers. Hence the high price demanded by the landlords who are more interested in getting the largest price for their korai than in the development of the mat-making industry. The problem of getting korai at cheap rates to the mat-makers may be solved by temporarily leasing Sircar padugai lands on average rents to the local mat-makers. This industry has great potentialities for expansion and can be a suitable occupation for both the agricultural and non-agricultural classes if a proper organization to collect the products of these workmen and to distribute raw material to parts where it is not easily procurable now is created which would check the exploitation by the middlemen.

Cotton Carpet Weaving.

In this group of districts the industry of carpet weaving is carried on in Srirangam and Karur of Trichinopoly district and in Kilviraraghavapuram which forms part of the Palamcottah municipality and in Mannirpallam, Kovilampapuram near Kalakadu, Pettai, Srivaikuntam and Alwartirunagari and also in the school for the blind at Palamcottah of the Tinnevely district. This industry was once carried on in the Central Jail, Palamcottah, but is now given up. Muhammadans are the principal workers with a sprinkling of a few other castes. In Kilviraraghavapuram there are 50 houses of Muhammadans with 50 looms of ordinary type and carpet weaving is their sole occupation.

Carpets of different sizes ranging from 6 feet to 15 feet long and 3 feet to $7\frac{1}{2}$ feet wide are woven in these looms. The length of the carpet may be increased if required but not the breadth as the looms are not broad enough to manufacture greater widths. Carpets of smaller width, i.e., up to $4\frac{1}{2}$ inches, are woven by one man and while the larger ones require two men who sit three feet apart and throw the shuttles each from one end to the other.

Different patterns of carpets are woven in these centres but the most common kind is of black and indigo stripes of 2 to 3 inches wide. Other patterns such as intermingling of yellow and white stripes are also woven in Mannirpallam. Artificial silk is used for some stripes in the weft for giving the carpet bright and

smart appearance. The carpets woven at Mannirpallam "Goldwin Cottage Industry" are closer in texture and have a brighter appearance than those woven at Kilviraraghavapuram. Except that carpets of greater lengths and breadths are manufactured there is nothing special in the manufacture at Kilviraraghavapuram.

The yarn is all mill-made and obtained locally. Carpet weavers generally get white yarn and have it dyed in the local dyeing houses. 12½s is taken in two edges and twisted by a wheel and this is taken in pairs for warp. For woof the same count of yarn is taken in three edges. In a carpet of 7½ feet wide there are 810 warp threads or 9 threads per inch. In Mannirpallam, three edges of 20s are used for warp and 3-20s or 30s or 5-40s are used for woof. In the school for the blind six edges of 16s are put for the warp and four edges of 20s for the woof. Weft yarn is not sized at all but warp threads are sized in Kilviraraghavapuram while in other places they are not, as doubled yarns do not require sizing.

The loom is of the ordinary type and both pit-loom and frame-loom are in use. Before weaving begins, the practice in Kilviraraghavapuram is to paste one end of the warp with mud to the front roller so that it might stick to the beam instead of the ends being fastened to an iron rod and fixed in the groove of the beam.

Four bundles of 12½s will be required for a warp which will give 20 carpets of 15 feet long. For weft 20 bundles will be required—

	RS.	A.	P.
4 bundles 12½s at Rs. 6-8-0 a bundle for warp ..	26	0	0
20 " " " " " " " " " " for woof ..	130	0	0
Dyeing charges for 20 " bundles at an average of Re. 1-4-0 per bundle	25	0	0
Preliminary operations for winding, warping and sizing	7	8	0
Sizing materials	5	12	0
Total ..	194	4	0

This gives 20 carpets, 15 feet long and 7½ feet broad, each carpet is sold at Rs. 11—value realized is ..	220	0	0
Profit ..	25	12	0

It takes two months to weave 20 carpets. The profit calculated above excludes the coolie that will have to be paid when weaving is done by a hired labourer. The adult member of the

house with the assistance of a younger member does the weaving. In any case the earnings of Rs. 25-12-0 for two months are poor when it is considered that all preliminary work had to be done by the weaver's family.

The carpets woven are taken to Tinnevely town and sold in the market there. Sometimes merchants themselves go to the weavers and purchase the carpets for varying prices. One redeeming feature is that carpet merchants use their own capital in the industry and do not depend upon the local sowcars.

Closely allied to carpet weaving is the tape and thread making which is for the time being confined only to the District Jail, Palamcottah, which meets the requirements of the Superintendent of Stationery. Quite a large number of convicts are put on this work. There are no looms for the weaving of ordinary office tapes. One end of the warp threads is tied to a beam, the other end is held in the fingers of the left hand and weft thread is passed through by the right at the same time as the warp threads are moved up and down by the fingers. The count of the yarn used, number of threads in warp and woof and the time taken to weave a given length are shown in the following table:—

Width of the tape.	Count of yarn used for		Number of threads in		Length woven in a day.	Price charged for 50 yards.
	Warp.	Woof.	Warp.	Woof.		
$\frac{1}{4}$ inch	2/6s	2/6s	11	16	50	RS. A. P. 0 7 0
$\frac{1}{2}$ "	2/6s	2/6s	22	16		
1 "	2/6s	4/6s	40	16	15	1 14 0
2 "			100	16		3 2 0
$2\frac{1}{2}$ "			130	16		4 2 8

Tapes of $\frac{1}{4}$ and $\frac{1}{2}$ inch are intended for supply against orders from the Superintendent of Stationery. The broader tapes are done for supply to the Coimbatore Jail which is said to get orders for them. These are useful for cots, and for stitching curtains.

Thread skeins are also intended for supply against the indent of the Superintendent of Stationery. Three edges of 10s are taken and twisted and rolled into skeins. The yarn is purchased from "Stanes & Co.," Coimbatore, and from Abdul Rahiman of Madras as yarn of low counts is not available from the Papanasam Mills. A bundle of yarn is purchased at Rs. 7.

One man is able to make 20 skeins in a day. A skein consumes a little less than 2 ounces of yarn and 3 lb. will be required for 30 skeins. A bundle of yarn of 10 lb. will give 100 skeins and this is done in $3\frac{1}{2}$ days.

In the Trichinopoly district carpets are manufactured at Srirangam, Karur, where this industry is in the hands of master workmen who work on factory lines. There are two factories at Srirangam and four at Karur working each with 40 frame-loom all fitted with fly-shuttles. There are about 40 to 50 workmen including women and boys working ten hours a day who belong to the Sengunda Mudaliar caste. They are paid by piece-work. Each male gets on an average from 6 to 10 annas a day, a female 3 to 3½ annas and a boy Rs. 4 a month. The carpets made here are thin and of smaller size required for spreading at dinners and for camp requisites. The width is 22 inches. They are exported to Chettinad. The yarn that is used is 20s for warp and 10s for weft and dyed in the factories. Yarn is purchased at Erode at the rate of Rs. 6 per bundle of 10s weighing 10 lb. and at Rs. 8 for 20s of the same weight. Dyeing costs Re. 1 to Rs. 1-12-0 per bundle. A pair of carpets weighing each 27 ounces having dimensions of 3 × 6½ feet can be made by one man in one day. It costs Rs. 1-14-0.

	<u>RS.</u>	<u>A.</u>	<u>P.</u>
The yarn required for it costs	0	14	0
Dyeing	0	4	0
Warping and winding	0	1	0
Total ..	1	3	0

The remaining 11 annas is shared by the actual weaver and the master workman. The weaver gets 8 annas for the work done. There are no mill-made carpets for competition and carpets worth about Rs. 2,000 are made per month and exported to Chettinad.

Coconut Coir Industry.

Of the four districts under survey, coconut coir industry is found to any extent only in Ramnad, Tirupattur and Srivilliputtur taluks of the Ramnad district and in Anjengo of the Tinnevely district, though coconut palm is found to grow in almost all the places of the districts. The most important factor for the growth of this industry is the water facility required for retting and the industry flourishes more along the coastal strips than in the interior.

Ramnad District.

In the southern portions of the Ramnad taluk, especially in the village of Periyapatnam where there are about 500 houses of Muhammadans and in the Singampunari village of Tirupattur taluk where there are about 40 to 50 houses of Uppukara Chettis and in Srivilliputtur where there are 30 to 40 houses of Telaga Chettis, coconut coir and fibre making are carried on to an appreciable extent. In Periyapatnam, where there are a number of coconut

gardens, the class of people that carry on this occupation are those that are employed as watchers in the gardens. In addition to the small wages they get as watchers they are allowed to appropriate the husks of coconuts for themselves free of cost for the trouble of unhusking them. The removal of husks is done almost immediately after plucking or within two days or three days after it. The husk is peeled off by striking against a pointed end of a steel or wooden spike firmly planted in the ground. About 1,000 coconuts are unhusked in a day by an adult. The soaking of husks is done in pits dug out for the purpose in the gardens where they get water on the surface and are kept under water for a period of eight to ten months. Then they are taken out and beaten against a stone with a wooden hammer and the fibre extracted. The system of soaking is not thorough in this place. There is no means of draining the stagnant foul water or letting in fresh water during the period of fermentation and consequently the fibre obtained is not the best quality. The fibre is sold to merchants who come from various places especially from Trichinopoly. Generally the separation of fibre from the husks is done by the owner himself but if coolie is paid, 50 per cent of the husk is given as remuneration. About Rs. 800 worth of fibre is manufactured in this village monthly out of which more than Rs. 500 worth is exported outside. Fibre worth one anna is converted into ropes of two mudis and each mudi is sold for one anna. Srivilliputtur workers get husks at 4 annas per 100. These are dried for four or five days and then beaten with a wooden mallet on a stone. In this case the husks are not soaked in water as is done elsewhere. Out of husks worth 2 pies, coir worth 6 pies can be made and this is done in three hours. Thus a family is able to make 2 to 3 annas per day as a subsidiary occupation.

At Singampunari, the workers who are Uppukara Chettis carry on this industry from time immemorial. Though there are 400 acres of coconut plantation in the village itself, they do not use the husks of the village as there are no water facilities for soaking. So they draw all the supply of fibre required from the two adjacent villages of Manamettupatti and Chokkalingavaram where there is a river which affords facilities for soaking. They pay Rs. 5 to Rs. 6 for that quantity of fibre that can be extracted from 1,000 husks which is about 100 lb. The process of converting husks into fibre is more or less the same as described above. The split husks are set to soak immediately as any delay after splitting affects the colour of the fibre injuriously. When they are placed in soak, they float at first, and in pits or staked areas they are left to themselves generally covered with leaf fronds or mats, but when they are placed in nets, heavy stones are placed on the mass to submerge it below

the surface and are removed one by one as the floatation power decreases and the mass finally rests upon the mud. Thus the husks are allowed to remain soaked for about 8 to 10 months until they become soft and the fibre could be easily removed. The soaking being completed, the husks are lifted, rinsed in fresh water to free them from mud and dirt and when drained and dry are beaten to separate the loosened pith from the fibre. It is believed that the nature of the water has a material effect upon the rate of retting and the colour of the fibre ultimately obtained. It is also believed that for the first submersion salt water is essential to give good colour but this opinion is not beyond contest. The fibre manufactured in the Ramnad district except in the coast villages is of inferior kind as the fibre is not extracted after proper retting. In some places the fibre is cleaned by spilling water mixed with tamarind flower powder and beating it with a stick. By this process the fibre loses its dirt and becomes white. The tamarind water is said to possess the power of cleaning the fibre. Thereafter the fibre is twisted by means of a spindle turned by hand. For manufacturing ropes three persons are required one for allowing the fibre to be twisted and two people for twisting two ropes at the same time, the fibre being fed by one man for both the twisters. Here wages for twisting are given at 12 annas for 50 ropes or 3 twists, each rope measuring 36 feet long and this is done in a day of 5 hours by three persons. Coir manufactured here is exported to various other places such as Trichinopoly, Pudukottah, Karaikudi, etc. Master workmen who give fibre for twisting are able to make a profit of 4 to 8 annas per 50 ropes twisted. The economics of the industry are as below:—

	RS.	A.	P.
Cost of 16 lb. of fibre including 2 lb. for wastage ..	1	0	0
Twisting charges for 50 ropes	0	12	0
	<hr/>		
Total ..	1	12	0
	<hr/>		

Fifty ropes are generally sold from Rs. 2 to Rs. 2-4-0.

Tinnevelly District.

Anjengo and Tanganasseri which have been added recently to the Tinnevelly district lie in the West Coast surrounded by sea on the west and backwater on the east. These two places have comparatively the largest growth of coconuts and possess natural facilities for carrying on coir industry but it is found existing only in the former. The Tanganasseri husks are sold to Quilon workers for manufacturing coir. The people engaged in the work belong to a caste of Izhuvas and coir making is their primary occupation. By far the largest number of husks is purchased from Trivandrum

and other places and are subjected to a process of retting in the same way as is done in Ramnad district, with the difference that the borders of backwaters, creeks, or mouths of rivers adjoining the sea which are liable to tidal action are selected for the purpose. The husks are to be beaten within a week of taking them from water; otherwise they will get dried up and the fibres will become reddish brown. After the fibre is beaten out, it is cleaned and sized by a small willowing machine which consists of a drum in which an iron shaft is made to revolve which carries a number of blades set spirally on its axis. The fibres are fed at one end of the machine and the shaft is revolved at a high speed. The blades seize the fibres between them and as they pass through a grid at the top of the machine they scrape off the pithy particles which drop to the ground. The fibres are also straightened and rendered soft. Spinning into coir or thread is also done by machine driven by man power. A big wheel is turned by a handle which puts two other smaller wheels into motion to which is attached a hook-like spindle. Two persons each holding one sliver begin by introducing the fibre into the spindle. They go backwards as spinning proceeds and after a given length is reached, the two farther ends are joined to a similar spindle and twisted. The two threads are taken through two grooves of a triangular piece of wood and are run through as the twisting proceeds.

The fibre manufactured here is of superior kind and its excellence is due to the fact that the retting process is complete and done with care and attention by frequently removing stagnant foul water and letting in fresh water. It is exported to Alleppey, Cochin, and other places. Generally, 10,000 husks can be beaten and the yarn spun by a family in about a month. This is one of the few industries which, if well organised could successfully compete as a cottage industry against a power factory. In Anjengo and in parts of the Ramnad district attention is given only to the manufacture of coir. Nowhere matting is done. The coir manufactured in Ramnad is of inferior kind and weak in strength. The workers there do not employ the ordinary hand machine for making yarn which are used in Anjengo and have to spin yarn by hand. Extraction of fibre from the husks is done by hand with great exertion. A husk-crushing machine and coir twisting machine may with benefit be introduced among cottage workers. Anjengo being surrounded on all sides by the Travancore Territory has developed the coir industry on the same lines followed in the Travancore State. It is much in advance of other places in the West Coast or in the Ramnad district. Being isolated, very little can be done for the further development of the industry. The workers engaged are

generally poor and stand in need of financial help. The coir produced is exported out of Anjengo. A Co-operative Society giving money credit to these workers is likely to be of immense benefit to them. I do not think there is any scope for introduction of weaving coir matting and the like in this small place.

Industries connected with Palmyras.

The industry which next to agriculture engages the greatest number of people in the Tinnevely district is the work connected with the palmyras. The last Census Report has recorded 67,993 persons in this district as engaged in drawing toddy. It appears to have excluded in the enumeration several others who are engaged in other industries connected with the palmyra. These industries are pursued almost exclusively by the Nadars.

Tinnevely is noted for its abundance of palmyras, and they are found in great numbers in the coast taluks of Tiruchendur, Nanguneri, Srivaikuntam and the western taluks of Tinnevely, Ambasamudram and Tenkasi. There is a small growth in Sankaranayinarkoyil taluk also. In Koilpatti the palmyra growth is sparse.

There are three classifications adopted for the palmyras. (1) Smooth trees which are fit for tapping. These are generally of over 10 years' growth. (2) Rough trees which are above 4 years' and below 10 years' growth and yet not ripe for tapping. These will be above 2 feet and below 10 to 12 feet in height. (3) Vadali, that is, saplings up to 3 or 4 years.

Smooth trees give sweet toddy or toddy. Leaves are lopped off from the smooth and rough trees. From the stem (mattais) the upper smooth portion is extracted and used for caning cots, chairs, easy chairs, etc., for making baskets of different sizes and shapes and for rope making. From leaves, mats, baskets for domestic use, water buckets so peculiar to this district, fans and a variety of other articles are made. They are used for roofing houses also. From the ribs which are removed with some portion of the leaf remaining attached to them winnowing and onion baskets are made. From Vadali and rough trees, the pathals, that is the bifurcated portions which hold the mattai and the leaves on to the trunk are cut and fibres extracted out of them. Sweet toddy is used for drink, and jaggery, candy, and sugar are boiled out of it. The trunk if well grained and aged gives very good and strong timber and is used as rafters and beams for houses. Untapped palmyras bear fruits which, when tender, are eaten as nongus. The juice in these nongus provides a cool and refreshing drink during the hot weather. When the fruits ripen, they emit a fragrant smell and they are eaten with avidity by all the low class people of the

country. The use of the parts of the palmyra trees as firewood perhaps requires no mention. Palmyra roots are sweet to eat and are a delicacy with the Nadars and other people.

Tapping for toddy, sweet or fermented, begins from February and lasts till June. Manufacture of palmyra jaggery is done only in that season. Shearing of the leaves is precedent to tapping and to prevent over lopping, a condition is imposed on lessees that not less than 8 leaves should be allowed to remain on the trees. From non-tapping trees the leaves are lopped off in August. Pathal beating and extraction of fibres is usually done during the off-season for tapping. Thus a woman will be employed in the boiling and manufacture of jaggery, during the tapping season and at other times, in the beating and extraction of fibres.

The several industries connected with the palmyras are described below.

Making of Jaggery, Candy and Sugar.—Palmyra trees of Kattupalai variety are tapped successfully for about 2 months in Kattupalai and Alagu stages, i.e., commencing from February when the sprouts will shoot out into branches. The other kind 'Paruva-panai' where the branches are not lopped off and the sprouts are allowed to grow become fit for tapping by this time. Jaggery is done soon after the sweet toddy season begins by boiling the juice and then pouring it out in coconut shells having eye-holes placed in a sandy bed moistened with water and allowing it to solidify. In one day 138 to 140 palams of jaggery can thus be manufactured.

	RS. A. P.
Cost of sweet toddy for 4 pots which contain about 20 to 21 Madras measures	0 10 0
Fuel, thistles, thorns, etc., for boiling	0 2 0
Castor seeds are powdered and thrown in small pinches to prevent the contents from effervescing	0 0 3
	0 12 3

The jaggery obtained from the quantity is sold for Rs. 1-2-0. The gain is therefore Rs. 0-5-9. One woman is enough to do this and there are 3 rounds in a day. Generally the whole family, the husband, wife, and children, is engaged in the business during the season and makes a net gain of Re. 1 a day on an average.

For making candy, the sweet toddy of May and June is used by placing it in pots and boiling it to a certain stage of viscosity over a furnace and then embedding the vessels underground to

allow crystallisation for a period extending from 5 to 7 months. The candy will sell at a fancy price of Rs. 7 to Rs. 9 per thuku (25 palams or 150 tolas) but less if the crystals are small. This industry is prevalent in Padukapattu, Kumatikottai and Sathangulam in Tiruchendur taluk. Dust sugar or sand sugar is also prepared from the above juice by spreading the contents of the pots at a certain stage over a mat and sprinkling water over it to remove dirt.

A superior kind of jaggery produced is 'Pattu or Chillukarupatti.' The juice is allowed to stand until it becomes slightly acid and is then filtered through a cloth and boiled. When it becomes sufficiently thick it is poured generally into small squares or cones cut in wooden planks and is left to cool and solidify. Spices such as cardamom are often added to it.

The instruments used for making jaggery and candy are simple enough, viz., pots, wooden spoons made of coconut shells and moulds of coconut or wooden frame. The manufacture of candy or sugar is limited to a few villages and requires a license from the Local Board. It is worth while to remove the restrictions on this kind of industry.

Mat weaving.—Mats of different sizes are woven by Nadar women in the spare hours as a subsidiary occupation in almost all the villages in the palmyra area by removing the nerve portion of the leaves, drying and trimming them. Small size mats are sent to Calicut for packing fish while bigger ones are sent to Bombay for spreading on the floor of ships. There are local merchants in every village who gather mats for export and the Nadar women who manufacture them find ready sales at their doors. A woman working 10 hours a day can prepare 12 mats in 2 days out of 18 palmyra leaves costing 2 annas and earn a net sum of 3 annas by selling her products for 5 annas.

Basket making.—The palmyra fibre is used for basket making of which a specialised form is the onion basket. Baskets are made by Kurava women and occasionally also by men as a subsidiary occupation; the inner layer of the basket is spun with tender leaves and the outer layer with fibres. This class of workers is predominant in some villages. The stems are purchased at As. 2 per 100 from palmyra owners and leaves at 50 an anna. Fifty leaves will do for the fibre extracted from 100 stems and 3 baskets of certain size can be made out of them by one woman in 6 days at the rate of one for two days. Those which are used by agriculturists are sold at 4 to 6 annas per basket and the earnings of a woman average As. 1-6 to As. 2-6 a day. The industry is prevalent in Sivagiri, Vasudevanallur, Puliangudi, Chokkampatti,

Kadayanallur, Idayangudi, Kulasekarapatnam, Sathangulam and almost all the villages of Tiruchendur and Srivaikuntam taluks.

Onion baskets are made by Muhammadan women as a subsidiary occupation from the nerves and leaves of the palmyra placed obtuse and interwoven obliquely upwards. The proportion of the nerves to the leaves being 3 to 1, 32 baskets worth As. 4 can be made out of nerves worth 2 annas and leaves worth 9 pies taken in the required proportion. One woman working 10 hours a day can turn out 25 to 35 baskets a day and her average earnings would be As. 1-3 a day. These baskets are sent to Tuticorin and thence to Colombo, the average monthly export being about three schooner loads. The Muhammadan women of Kulasekarapatnam, Udayangudi, Paravankuruchi, Iruppur, Pudukmani, Kalangudi, Kayamalai, Seerudiapuram and Kayalpatnam have been doing this work from a long time. Recently Adidravidas and Nadar women also have taken to it.

Fancy baskets, boxes with square bottom and circular shaped mouths and toys are made by Paravar women in Manapad (there being 1,800 houses at work) out of tender palmyras split longitudinally and dyed with aniline dyes and vegetable turmeric and interlaced also for the sake of ornamentation. In other villages this is made by Nadar women. The chief variety is what is known as 'Pilapottis.' These have a commercial value in Ceylon but other baskets square in shape with two layers inlaid one over the other with four chambers in each to serve as a condiment box are also made. An improvement over this is the box of rectangular shape with six boxes put one into the other telescopically. These have fancy values.

From one leaf purchased at an average price of 9 pies 25 to 30 pilapottis can be made. One woman working for 10 hours a day is able to do 6 baskets. Each basket is sold to local agents at 3 pies and so 30 baskets fetch As. 7-6. The cost of dyes, etc., comes to Rs. 0-0-3. The gain is As. 6-6 thus giving an earning of As. 1-3 per day. These are collected in the village of Udangudi and sent to Colombo.

Cot caning.—Nadars, Shervais, Mukundars extract fibre from the upper concave portion of the stem of the tree and use it for caning cots, chairs, easy chairs, etc., the same splits being used for woof and warp and the weft splits being taken through each fibre of the warp alternately and when necessary each line of the woof as it is gone through being beaten as in weaving with the butt end of a stout iron needle, blunt at one end and broad but tapering into the shape of a spoon at the other. Usually one adult with two boys works at a cot. A cot of 6 feet by 3½ feet is finished

in 8 to 9 hours for a wage of Rs. 1-4-0 and if the caning is very close the wages range from Rs. 2-8-0 to Rs. 3. The quantity of fibre required is extracted from 100 mattais and costs Re. 0-4-0. Out of Rs. 1-4-0 earned, 4 as. are given for fibre and 4 as. to one boy and 2 as. to another boy. The adult thus gets only Re. 0-10-0. On an average there is work for only ten days and the worker earns Rs. 10 a month. The demand for these articles is local. It is however to be remarked that a cot caned with palmyra fibres will last ordinarily for about a year and if it is closely woven may last for 3 years. The implements used for matting a cot are only two sickles and two needles each sickle costing Re. 0-4-0 and each needle Re. 0-1-0.

Extraction of palmyra fibre.—By far the greatest industry engaging not only Nadar women but also Muhammadan women, goldsmiths and Konars is the extraction of fibre. It is carried on on a large scale in Udangudi, Pallipattu, Pottankadu, Arasur, Adaikalapuram, Kumatikottai, Vaithilingapuram, etc., and in every village of Sathangulam division of Tiruchendur taluk and in Idayangudi and Thisayanvalai and other villages in the eastern half of Nanguneri taluk. The pathals which form the bifurcated portion that holds on the stem and leaf to the trunk of the tree are removed by a group of 5 or 10 men and the quantity removed costs 6 to 8 as. per 100 pathals for black variety and 3 to 4 as. for the white variety. The women beat the pathals (brought home by the males) with stone or a wooden hammer against a slab or mortar. This work is done from August to January. Each tree gives 12 pathals in a year. 50 pathals can be beaten by a woman in 3 days of 9 hours work on each day. These pathals are teased then by hands and the fibres thus cleaned are tied into bundles and taken to the shandy, etc., at Udangudi and Thisayanvalai. These are shipped to Tuticorin.

The black variety sells at 2 to 2½ as. per rathal (21 tolas) and the white variety from 1 to 1¼ as. From 50 pathals the fibre extracted will be 3 rathals of the black variety and 4 to 4½ rathals of the white variety. The number of the black fibres in a pathal will be only ¼th of the white but the black fibres are more tough and hard and so weigh more.

	Re.	A.	P.
3 rathals black variety	0	6	0
4½ rathals white	0	4	6
	0	10	6
<i>Deduct</i> cost of 50 pathals	0	4	6
Gain is	0	6	6

This is earned by one woman in 3 days. The earnings come to about Re. 0-2-0 a day.

In Adaikalapuram the Roman Catholic Mission has attached a shaft from the Rice Mill which works every Monday and Friday to a machine which is used for dashing fibres from pathals. The machine cuts up and crushes the pathal and splits it up into individual fibres. The fibres are gathered and sized by a woman coolie by vigorously passing through a set of spikes fixed on a plank and she picks out the fibres separating the black from the white. Afterwards the fibres are dried; sized and tied into bundles. All this process gives work for 4 female coolies. Every male coolie is paid Re. 0-4-0 a day working for about 6 hours and a female coolie Re. 0-2-0. This machine has been at work for the last 10 years though for the last 5 years it has been doing very little work.

Tuticorin has been the collecting depot not merely of the fibres produced in the district itself but also the fibres got from such distant places as Nellore, Bellary, Cuddapah, Anantapur and Kurnool. Fibres from these districts were being received in Tuticorin till 5 or 6 years ago but as the freight charges were enhanced by the Railway Company they are not received now. They find way to the Cocanada Port which is nearer. But after the recent reduction of freight (8 as. to 6 as. per maund) consignments are of late being received from Nellore. Some quantities of fibre are got from the Tanjore district also, but in quantity that is nothing when compared with the local out-put.

Four of the important firms at Tuticorin dye the fibres and assort them in grades. The assorted ones are then tied into bundles. There is a cutting machine which cuts the fibres to a definite given length according to the requirements of the consuming firms. Each bundle weighs 56 lb.

Most of the fibres go only to Germany, particularly of classes 1, 2 and 3 of undyed ones, while dyed variety goes to Britain, United States, Australia, France, etc.

The dyeing is usually of black and brown, alizarine dyes being used. The cost of dyeing 1 cwt. of fibres is about Re. 1. The three sorts of fibres cost Rs. 14-8-0 per cwt. and are sold for Rs. 16-8-0 by these firms.

At a rough estimate, the total shipment of fibres from Tuticorin is about 15,000 cwt. or 750 tons per month.

The question of establishing an industrial business in one of the southern districts that would utilize the fibres now exported in large quantities in making brushes, etc., was engaging the attention of the Government for a time. But beyond ascertaining that rough brushes and brooms which are consumed by the Railway Companies

and Factories could alone be made out of these fibres nothing tangible has been done. It appears that some four boys of St. Xavier's Industrial School, Tanjore, were trained in brush making, etc.

It is possible that the fibres besides being used for the manufacture of brushes and brooms might be found useful for various other purposes. Their utility for other purposes may be investigated by experts and means found to utilise in this Presidency the enormous quantity of fibres that are now exported over the seas.

Ramnad District.

Articles made out of palmyra leaves such as baskets, winnows, boxes, mats, etc., are manufactured largely in the taluks of Ramnad, Sivaganga and Srivilliputtur of this district. The industry is practically in the hands of the depressed classes and tree-tappers whose women engage themselves wholly in this work. Fancy articles that attract the attention of the pilgrims such as boxes, baskets, etc., with coloured leaf is manufactured on a large scale in pilgrim centres like Tirupallani, Rameswaram and Devipatnam and Srivilliputtur and these find a ready sale with the pilgrims who visit these centres. Of all places in the district, Tirupallani commands the largest sale and there are about 200 families engaged in this industry. Almost all the people except Brahmans and Mubammadans are engaged in it. Weaving is purely done by women while the males assist them in getting the raw material required, i.e., palmyra leaf. Generally shoots are purchased from tree owners at two to three pies per shoot. The leaves are then dried and made into small strips suitable for weaving after removing the ribs. In one day a woman is able to manufacture one box of 10 inches by 10 inches by 10 inches out of 3 shoots and this can be sold for Re. 0-4-0. Thus a woman is able to earn Re. 0-3-0 a day exclusive of the cost of colour which is six pies per box. About Rs. 500 worth of articles are manufactured in this village and these are sold locally to pilgrims and also exported to various pilgrim centres such as Rameswaram, Tirupati, etc., where there are demands for these articles. They are even sent to such distant places like Benares. There are local merchants who advance money to workers and collect the finished articles at a rate which is a little lower than what they would get if they were sold to pilgrims direct.

In Ramnad town and Srivilliputtur mats are woven in large numbers and these are purchased by the local merchants who advance money to the workers. These mats are largely used for packing purposes.

There is no regular organisation for collecting the products of the makers and these are exploited to some extent, though thanks to the competition among the collecting agents, there is not much scope for undue profiteering.

Bamboo Baskets.

Trichinopoly District.

Unlike the Tinnevely and Ramnad districts where baskets of palmyra leaves are made in large quantities, Trichinopoly manufactures baskets, etc., in some of its villages out of bamboo imported from the neighbouring districts of Coimbatore and Salem, in addition to the small supply locally obtained from Pachamalais and Kollimalais hills. This industry is in the hands of a special class of people called "Medars," whose whole-time occupation is the preparation of articles from bamboo. There are about 100 families of them at Thiruvanaikoil, 25 families at Karur, and 4 families in Turaiyur. The articles generally made are baskets for the varied uses of the agriculturists—winnows, sieves, thatties, etc. The raw material required by the Turaiyur workers is obtained from Pachamalais and that required by the Thiruvanaikoil workers is got from Trichinopoly where imported bamboos are kept for sale. In one day an adult member is able to manufacture articles worth Re. 0-12-0 to Re. 1 out of bamboo worth 8 annas and earn a wage of 4 as. to 6 as.; but a family earns only about 10 as. a day by manufacturing articles worth about Rs. 2. The articles made by the Medars are sold to a class of people called Koravars who hawk these articles in the various villages, where there is good demand for them. The total production at Karur is valued at about Rs. 18,000 per annum and that at Thiruvanaikoil is four times that of Karur. Medars have no lands of their own but only depend for their livelihood on their handwork and as they are a class of hardworking people any attempt to organise their industry on a co-operative scale would do them a great help and put them in a better position.

Extraction of Sunn Hemp and Aloe Fibre and manufacture.

The extraction of sunn hemp and weaving it into patties and Kamala thattus, etc., is the subsidiary occupation of the class of people called Saluppas or Telugu Chettis. The people of this class are scattered in different villages of the Tinnevely district. There are 40 Thalakkattus with 35 houses in Udayarpatti, 50 in Narasinganallur and more or less an equal number in Gopalamudram, Pailakkal, Pudukudi and Ambur in Ambasamudram taluk and Vellakkal and Veerakeralampudur in Tenkasi taluk and Muttalankurichi in Srivaikuntam taluk. This industry is flourishing in Ambur, Gopalamudram, Narasinganallur and Udayarpatti.

Sunn hemp is a species of fibre crop which is grown immediately after the harvest of paddy crop in wet lands about February or March and harvested at the end of May. It is subject to periodical pests once within 30 days of its growth and again at the time of flowering. The pest is wholly destructive to the crop if it appears when it is young but will affect the yield seriously when it appears at the flowering time. The 'Saluppas' who carry on sunn hemp weaving take lands on lease if they have not got their own and raise the crop. The rent varies from Rs. 15 to Rs. 60 per acre according to the quality of the land on which it is grown. The total expenses for cultivating an acre come to about Rs. 65 and the yield from it is about 100 bundles of green stalk which when beaten into fibre would with the cost of dried stalk fetch about Rs. 65 so that the cultivator has absolutely no margin of profit. As the crop is ordinarily raised by the manufacturer of 'Kamala Thattus' and as he himself works on the field he is able to save the watching and watering-expenses, and his main object being to provide himself with the raw material required for his industry he does not much mind the low margin of profit in raising the crop. The method of extracting fibre from the stalk is the same as in Cuddapah. Dried stalks are soaked in water for sufficiently long time, i.e., about 5 or 6 days and then splashed against the surface of the water and again beaten against hard surface after drying so as to separate the fibre from the stalk. This process is not done all at once with all the stalks that the grower possesses but he does it piecemeal according to his convenience and necessity. Spinning of fibre is done by womenfolk by twisting the fibre on the lap by means of a spindle revolving in a coconut shell. Warping is done on a peg board. Before the warp is put on the loom it is soaked in water placed on a slab and beaten so that any impurities still remaining in it might disappear. The warp is then sized with rice ganji. The weaving is of the coarsest kind and the implements used are also quite primitive. The healds consist of a small rod 2 feet long with a bent stick tied to it at either end like a bow. A thread is twisted round it loosely and each alternate edge of the warp is taken through it. The alternation in weaving is obtained by slanting the bent stick forwards. The other parts of the loom are the same as those described in the Cuddapah Report, and the method of weaving is also the same. Each pick in the weft is beaten against the previous weft yarn by means of a stout stick as in cumbly weaving. Thattus of width of 9 inches to 18 inches are woven. There are 110 edges in the warp if the width is 9 inches and 140 for 14 inches. Patties are generally of 12 inches wide. The loom is not suitable for weaving more than 18 inches wide. Patties are used for curtains, and for spreading purposes and as canvas for easy chairs,

gunnies, etc. A man helped by his wife will be able to weave one Kamala Thattu a day which can be sold for Rs. 1-8-0 with edges unstitched and for Rs. 1-13-0 with edges stitched. Patties of 22½ feet also are sold for Rs. 1-8-0 because the yarn for this is made from the wastage of hemp and also the weaving is loose and uneven.

Three bundles of stalk yield 1 tulam or 14 lb. of hemp valued at Rs. 1-8-0 or Rs. 1-12-0 and three Kamala Thattus costing Rs. 4-8-0 can be manufactured out of this.

As a subsidiary occupation this industry affords very good possibilities in that the raw material sufficient for a year's need can be stocked and drawn upon whenever required. Though 'Saluppas' are alone engaged in this industry, there is no reason why others should not take to it. The area under sunn hemp cultivation in this district varies from 270 to 450 acres during the last 5 faslis and is gradually on the increase. But how much of the crop grown is used for extracting fibre and how much for manurial purposes is not ascertainable; but there seems to be a possibility of increasing the area under sunn hemp if the Agricultural department could do anything to minimize the ravages of pests attacking this crop.

Match Industry.

Ramnad District.

There is a match factory in the Sattur town of the Sattur taluk known as the "Standard Match Manufacturing Co.," with a capital of Rs. 4,000 divided into twenty shares of Rs. 200 each and another at Sivakasi by the name of "The South Indian Lucifer Match Works." The former was started two years ago and is now able to make a small profit. The prepared veneers and splints are obtained from Palghat from one Mr. Palaniyappa Chettiyar. The price of veneers sufficient to make 100 gross boxes and 2 maunds (Bengal maunds) of splints is Rs. 30 and the railway freight is 12 annas per maund. The rates vary according to the distance. One maund of splint is found sufficient for 40 to 50 grosses of boxes. There are three different sizes of boxes, small, medium and big. The small size is sold for Rs. 1-4-0 per gross, medium for Rs. 1-7-0 and the big size for Rs. 1-9-0. For arranging splints in 25 rows of sixty each 2 pies are paid as cooly. This work is done by women in their houses. Women are also given veneers for pasting them into boxes at the rate of 4 annas per 1,000. Outer boxes are made by boys who are employed on monthly wages of Rs. 8, 9, 10, and each boy is able to make at least 20 grosses per day.

When the splints are arranged in rows, they are levelled and the heads are pasted with the solution of sulphur and phosphorus and allowed to dry. After the boxes are filled with matches they are labelled. A boy who is paid Rs. 3 or Rs. 4 per month is able to fill up, arrange, paste labels and make ready about 20 gross in a day. The average production of this factory is about 1,500 gross per month. There are about 25 boys working in the factory and the average monthly salary of servants amount to Rs. 240. About 40 women are given work in their own homes for pasting boxes and arranging sticks for coating with sulphur. The cost price of a gross works out at 14 annas irrespective of the size. The goods are sold free of freight for delivery at the door of the purchaser. Even though the selling price is lower than those of the imported matches there is not so much demand for the locally manufactured matches as these are definitely inferior in quality. A gross of imported matches costs Rs. 1-7-6 whereas the local manufacture is sold for Rs. 1-4-0 only. The work is done throughout the year but during the rainy season for about two months it will be slack owing to the difficulty in drying splints coated with chemicals.

Trichinopoly District.

Illuppur, 31 miles from Trichinopoly is the only centre where matches are made in this district. There are at this place two small factories employing about 30 to 40 hands mostly boys. The splints and veneers are imported from Malabar at Rs. 7-8-0 for a Bengal maund of splints f.o.r. The daily output of each factory is about 40 gross of match boxes, each containing 64 matches. A gross costs Rs. 1-6-0. They are sold locally in the Trichinopoly and Tinnevely districts. Almost all the workers are Adi-Dravida boys receiving cooly at the rate of 2 to 4 annas a day for filling 20 plates of match splints, each plate containing about 2 dozen match boxes. A workman makes 10 gross of outer boxes in a day. Nine pies are paid for making one gross of inner boxes. The value of paste and paper is 5 pies. The combustible material for a gross of boxes costs 6 annas. The total cost of making a gross of match boxes comes to Rs. 1-3-0 and the owner of the factory gets about 3 annas profit per gross out of which he has to pay interest on the capital of Rs. 5,000. For one month the output in each factory is about 20 cases each case containing 50 gross. The total annual output from both the factories is about 500 cases costing about Rs. 35,000.

Tinnevely District.

Thisayanvalai is a place of some importance in the Nanguneri taluk. It lies 17 miles south-east of Nanguneri and is 3 miles from

Five or six years ago a match factory was opened by a local merchant in the town on an humble scale. He used to import wood from Malabar and had splints and veneers made by a machine worked by hand. The inner boxes were made by women to whom the required things, paste, paper, etc., were distributed. The outer boxes were done by young boys who were paid Rs. 4 to Rs. 5 a month. For making inner boxes a cooly of 8 pies was given per 100. Splints were filled into wooden frames by women and boys in their homes and were given 2 pies for a frame. The cost of making 144 boxes worked to Re. 1. The market price of one gross of match boxes is Rs. 1-6-0 to Rs. 1-8-0. Foreign imported matches sell at Rs. 1-12-0 to Rs. 3-4-0, but they are decidedly of a superior quality. The gain of only 6 annas per rupee has been found to be inadequate for the working expenses of the factory and the owner has closed it down. The chief cause for the failure of this concern was the selection of a wrong place for the manufacture. It is far away from the area where suitable wood is available and has no convenience whatever in getting the chemicals required for manufacture nor has it any facilities for transport of finished goods, being situated in the interior of the taluk. There is no other place in the district where this industry is adopted.

The factories at Ramnad and Trichinopoly differ from the factory at Thisayanvalai in that they get ready-made veneers and splints from Palghat instead of importing the wood required. This is a wiser plan as it would avoid the wastage of wood involved in turning it into chips and splints and the payment of unnecessary railway freight thereon.

For the success of match industry, the factory should be located in a place as far as possible near the forest where suitable wood is available and should have facilities for transport of wood from the forests and for the despatch of manufactured goods. The places where these factories are existing have no such facilities but the difficulty is got over by importing ready made splints and veneers from Malabar where they could be got at the cheapest rates. So long as the factories at Palghat are able to supply the splints and veneers at the present rates, it is possible to manufacture matches at rates cheaper than the imported ones but when the cost of wood increases at Malabar, the inland workers would be hard hit. The only important species of wood in use in manufacturing matches is 'Bombax Malabaricum' and in the course of my enquiry at Palghat I learnt from the manufacturers that the supply of this variety of the wood is getting smaller and smaller and that the owners possessing wood are taking advantage of its usefulness for manufacture of matches and enhancing the rate. At present the rate per cubic

foot is 6 to 8 annas and the factory owners are apprehensive that by the increase in the price of wood or by denudation of the suitable wood in places nearer at hand the industry might receive a set back. It may, therefore, be necessary for Government to have the different varieties of wood available in the Malabar forests examined and tested to find their suitability for match making. This industry combines the advantage of employing cottage workers as well as organised labour and requires encouragement.

Lace and Embroidery works.

These are minor industries capable of being pursued by all women, the rich and the poor, but at present are confined only to the several Missionary Industrial Institutions in the district of Tinnevely. Idayangudi, Vadakangulam and Tuticorin are the chief centres where such industries exist, and are pursued more by the boarders and girl students of such institutions and in rare cases by those who have left them after undergoing the necessary training.

Pillow lace making was during the pre-war days very popular and engaged several pupils as there was demand from the Continent. Since the war foreign markets have become dull and the demand for pillow lace work has diminished. There are several designs for the different varieties of lace and each variety differs not merely in the width but also in the pattern and in the several reliefs contained in them. The yarn used is usually of very high counts. In Idayangudi and Tuticorin, English yarns of 120s, 200s, 250s, and 300s while in Vadakangulam English yarn of D.M.C. 20s, 25s, 30s, 35s, and M.F.A. 25s are used. Some time ago Belgium yarn of 90s was used for lace work but it is now given up. As yarn of low counts is used in Vadakangulam the lace manufactured there is stouter and more rough than that made in Tuticorin and Idayangudi. In Idayangudi, there are 11 girl students who are engaged in doing only pillow lace making as they do not know other kinds of work. The other institutions have almost given up this industry and have diverted their attention to other more remunerative branches, viz., embroidery and drawn thread work. The Mother Superioress of Tuticorin says that there is demand for embroidery and drawn thread work even from some Indian ladies. These institutions have therefore taken to this variety of work also.

Drawn thread work consists in the removal of some of the contiguous threads both in the warp and woof of the fabric and working some floral reliefs in their place by means of a needle. Usually this is worked only on fine linen or cambric. Orders for

such work are usually accompanied by the cloth required but in cases where the cloth is not supplied, the institutions purchase cloth, work the embroidery and supply. The markets for these are the United States, England, and within India, Delhi, Madras, Bombay and other places. It is said that most of the work is generally undertaken in execution of orders received.

Side by side with these industries the pupils in the Holy Cross Convent, Tuticorin, are also taught dress-making and needle-work. The dress required by the pupils is stitched by themselves and in this way the pupils are self-reliant, in the matter of their dress. The ordinary women frock is the usual wear stitched by them. When occasional cloth presents are made by their parents or friends the pupils convert them into dress. In Vadakangulam, there is a machine (Harrison's Patent Knitting Machine, Agents, W. H. Brady & Co., Bombay) to make socks, which costs Rs. 350. Two of the pupils of the school knit socks and stockings by it. Cotton and wool yarn obtained from Cawnpore mills is used. Two pupils working 10 hours a day are able to do 10 pairs of socks. These are sold locally among the Missionaries to meet whose requirements they are produced.

The girls are paid wages when they reach the stage in their course of instruction to make articles which are marketable. Even those who have left the institutions go there to work in the several branches. Exquisite as the workmanship is and complicated and superfine as the laces are, the remuneration obtained by the girls is not commensurate with the trouble involved and the time taken. An expert woman earns at the most 3 to 4 annas a day on an average. For complicated work she is able to earn 8 annas but such wages are rarely got.

So far as the persons engaged in the industry are concerned they do not get an adequate return. The chief reason seems to be that machine-made lace and knit work have dumped the market everywhere and sell very cheap and that there is no great Indian market for hand-made work. But it is only the few who have recognised the durability and the superiority of the hand-made lace and embroidery and to whom cost is no consideration that go in for it. The markets where this kind of work is appreciated are far away from the centre of production and it is only through the philanthropic activities of some of the Missionary ladies of these institutions that at least the existing slender demand for these articles has been secured.

This is one of the few industries that is suitable for both the rich and the poor which could be carried on indoors, but very few Hindu women have taken to this. The rich classes seem to

entertain some prejudice against seam work but it is now fastly disappearing. If high class women could take to this, there could be reduction in the tailor's bill of every house.

In 1924, the Government appointed Miss B. Tweddle of the Wesleyan Mission to conduct a comprehensive survey of the lace and embroidery industry in the Presidency in order that sufficient data might be available for making definite proposals for its improvement. Miss Tweddle submitted her report in March 1925, making the following suggestions:—

(a) The refund or removal of the Indian customs duty on raw materials imported or made up into lace and embroidery for re-export;

(b) the establishment of an agency in Madras for distribution of raw materials;

(c) the establishment of a central collecting depot to act as an intermediary between the manufactures and the export trade;

(d) the appointment of an agent in London to collect wholesale orders and represent Government at trade exhibitions;

(e) the appointment of a lace expert to attempt to raise the standard and quality of the work; and

(f) the adoption of patterns of distinctive Indian design.

The Government have not approved of suggestions (a) and (e). With regard to (b) and (c) they consider that it would be necessary to have a strong central organisation in the Presidency which will keep itself in touch with the industry and bring to its notice upto-date requirements of consuming markets, local and foreign in the matter of design and finish and aid in the development of new lines of work wherever possible or necessary. As to the central organisation, they say the only one that suggests itself as likely to prove useful for undertaking the work described above is the Women's Committee of the Victoria Technical Institute, Madras, which has been doing very valuable work in encouraging industrial work for women and whose experience and knowledge would therefore be useful for the work in view. The proposal contained in (d) has met with their approval. There is no doubt that the Women's Committee might serve as a link between the cottagers and the London agent but the main difficulty is the market. No development of an industry is possible unless every worker is sure of readily marketing the goods produced by him at a proper rate of payment. The workers are now dependent on missionary institutions which provide them work. They sell

their make to them for whatever price they may choose to offer. These institutions in their turn depend to some extent upon the Victoria Technical Institute for sale of their goods, which however, cannot purchase all the production. Large quantities of finished goods lie for a long time in the Institute without finding a ready sale. What is required is that the London agent should be intimately acquainted with the types of product that the industry can put on the market and devote his attention to finding markets for them. The Government should purchase the types for which a steady demand is discovered and send them to their agent for sale. This will involve Government in financial risk but it cannot be helped if the industry has to develop. As regards embroidery more often the work is done on material which is not worth a fraction of the value of time and labour spent on it and poor cottage workers have not the means of providing themselves with suitable fabrics to work upon. It seems therefore necessary that the workers on embroidery should be provided with material. An attempt in this direction is likely to help the advancement of this industry.

Gold and Silver Lace Thread Industry.

Madura town was once famous for the manufacture of gold and silver threads called lace which figures so largely in the borders of the more expensive kinds of cloths and turbans; but the industry is now on the decline as the local weavers use the cheaper French and English threads exclusively. There are at present seven families of Muhammadans engaged in this industry in the town in order to supply the demand from Tinnevely and Malabar where the lace is used for bordering towels. The silver thread is prepared by melting silver and lead in a crucible and casting the alloy in thin bars. These bars are hammered still thinner and then drawn through a series of holes of gradually diminishing size until they are transformed into exceedingly fine threads. Similarly gold threads are prepared by beating a silver bar of a cubit long into $\frac{1}{2}$ inch thickness and covering it with gold plates before being drawn. Until the wire becomes $\frac{1}{18}$ " thick it is drawn through an iron press and then through an apparatus consisting of two rollers revolving in opposite directions with a disc in the centre. The maker winds the wire to one roller and then takes one end through the disc and fixes it to the other roller, and twists it by a handle until the whole length of the lace passes through the disc and winds round the opposite roller. Then a disc with a smaller eye is fixed and the thread is passed through it and drawn and wound round the opposite roller. This

process is repeated until the wire is drawn to the required fineness. After being drawn, it is given over to women for being flattened. Three tolas of gold lace generally measure about 3,000 yards long and are sold for Rs. 8. The wages paid for drawing this length are Re. 1 and it takes two days for a man to draw the full length. A woman is paid As. 8 for hammering the drawn wire into flat lace and she is able to do this in four days' time. The average net profit per 3 tolas exclusive of the wages paid is As. 8. Discs are obtained from France and are embedded with hard precious stones to lead the thread and the price of each disc varies as shown below according to the kind of precious stone used, such as ruby, sapphire or diamond.

				RS.	A.	P.
Ruby disc	..	..	..	1	0	0
Sapphire	..	..	..	5	0	0
Diamond	..	..	..	12	0	0 to 15 0 0

Gold thread when passed through 7 p. disc assumes exquisite fineness and cannot be drawn further without breaking. Similarly, silver when drawn through 8 p. disc assumes the finest thinness. These discs generally last for two to three years.

Tinnevely District.

Viravanallur of Ambasamudram taluk, Tinnevely district, is the only place where the flattened silver threads of Madura are bought, twisted and smoothed with yellow colour. At one time this village used to manufacture threads of its own, but it now entirely depends upon Madura for its supply, owing to the impoverished condition of the makers who have little or no capital with them. The thread imported is twisted round yarn after it is coloured yellow. The yarn used for twisting is 70s and 80s of red and white combined and is thrown over a smooth bamboo pole planted horizontally and is weighted by two spindles at either extremity so that they may remain side by side. The spindle at one extremity of the yarn is twisted, while the other at the other end counterpoises it in position and when the yarn is twisting, the lace is gently introduced and is twisted along with the yarn. To impart yellow colour to the silver thread, turmeric powder in small quantities is sprinkled over a smoking paddy straw in small quantities. When it begins to fume it is covered over with a mud pot with a perforated bottom turned upwards. As the smoke emanates through the holes, the threads are spread over it loosely and sprinkled over with turmeric powder and gently turned this side and that side until they attain the golden tinge. Great care is necessary in the operation as even a little overheating would char the whole thread.

The lace thus manufactured is almost consumed locally in the manufacture of fine male cloths with lace borders and any surplus finds its way to Palghat and Malabar.

The silver thread is purchased at Madura at Rs. 4-8-0 per 10 virahanedais. The financial aspect of the industry is worked out below :—

	RS.	A.	P.
Cost of lace threads 10 virahanedais or $2\frac{1}{3}$ th tolas ..	4	8	0
Cost of labour for twisting the thread over the yarn ..	2	8	0
Cost of yarn and colouring the silver threads into yellow	0	12	0
Total ..	7	12	0

This is sold for Rs. 8-4-0. The profit obtained is only As. 8 per 10 virahanedais of silver thread. On an average 100 to 150 virahanedais are worked in a week. Purchase of threads is made for cash, but manufactured lace is invariably sold for credit and money got only after four or five months.

So far as the apparatus used for drawing the silver or gold wire is concerned, the existing plant is satisfactory and costs very little, but the hammering of the wire to the required flatness is a tedious process. Though the women employed on the work beat at one time 12 to 15 threads together, much time and labour can be saved if a machine for flattening the wires can be made available to them. A ring spindle arrangement to wind gold or silk thread round silk or yarn will be an improvement over the existing system. Such machines worked by hand are said to be in use in Benares. A demonstration of their working by the Industries department will educate the workers and help the introduction of such contrivances in their business. Small loans, if necessary, to purchase such machines may be granted by Government with terms of easy repayment.

Metal Industry.

Manufacture of articles from metals, especially from copper, brass and aluminium intended for domestic use, is carried in almost every centre where a good many of the artisans of the smithy class live. Smiths as a class have acquired hereditary skill in the working of metals from the highest to the lowest value, i.e., from gold to iron. These people form the village artisans and there is not one village without having at least a few of them. But they live in large numbers in big towns of importance and pilgrim centres where they have greater opportunities of being employed. Workmen from Goa who are adepts in beating metals are largely employed in Madura and Ramnad districts. A brief description of the industry in each of the important centres is given below.

Madura Town.

Merchants dealing in metal-wares supply the necessary raw material to the workers who have no capital of their own and take back the finished products at a rate a little less than what is prevailing in the market. The chief articles manufactured here are bell-metal kujahs, tumblers, kuthuvilakku or lampstands. These are ordinarily cast. Workers get brass, copper and zinc from the bazaars on credit and also get advances of money from merchants towards cooly and other expenses. For a lampstand costing Rs. 10 the raw material including fuel costs Rs. 6 and the workers get a cooly of Rs. 4 and it takes one week for a man to complete this. There is no difficulty in the matter of selling the wares, but the merchant accepts them at a reduced rate of As. 8 to Re. 1.

The town of Dindigul has got about 300 to 400 houses of smiths which are engaged in various industries such as manufacture of iron safes, locks, bell-metal kujahs and brass vessels. Even though kujahs are manufactured in various other places, the town of Dindigul has earned a name for its quality. There are five families engaged in this industry. For making kujahs four parts of copper and one part of tin are mixed and the whole thing is melted in a crucible prepared locally. Moulds which are wrapped with wax coated over with clay are kept ready heated and the molten fluid is poured through a hole at the top. The fluid, when cooled, takes the shape of the vessel required. The mould is then broken and the vessel which has crude shape is carefully filed by a lathe polished and made ready for sale. Generally for preparing a kujah of 7 seers weight the metal required is about $12\frac{1}{2}$ seers.

		RS. A. P.
$12\frac{1}{2}$ seers of bell-metal	consists of 10 seers of copper	
worth	.. .. .	2 8 0
$2\frac{1}{2}$ seers of tin	.. .. .	3 2 0
Total		5 10 0
Wages for melting, casting, polishing, etc., for a kujah.		5 4 0
Total		10 14 0
Deduct value of metal dust got back		0 10 0
Net cost		10 4 0

The work can be completed in seven days by one worker working by himself but it is not done so. Each process in the manufacture is done by a separate person or sets of persons, some engaged in casting, some attending to the preparation of moulds and others filing and giving a finishing touch. The wages for each man vary

from 10 annas to one rupee but the total amount spent for a kujah may be taken as Rs. 5-4-0. The finished kujah will weigh only 7 seers against $12\frac{1}{2}$ seers of alloy. Besides a wastage of $2\frac{1}{2}$ seers of metal, there will be thrown out 3 seers of metal dust in the act of filing. The price of a kujah is fixed at Rs. 1-8-0 per seer after deducting the value of dust which is taken at half the cost of the metal. The profit made on it will be about 4 annas besides the wages earned by the worker himself. He is able to reduce the price for wholesale dealers who place large orders with him. Lampstands and other articles are also made. Crucibles used for melting are all country made and are not fit for casting more than once. If crucibles of foreign import are used, they may last for casting many times. The kujahs manufactured here are sold locally and the industry is declining as the cost of these is comparatively higher than those made at Kalahasti or Kumbakonam.

In Tirumangalam of the Madura district where there is a Kallar settlement, manufacture of articles made of brass is taught to Kallar boys. The brass sheet required is supplied by a sowcar and articles as per his orders are prepared and supplied. When other articles not included in his order are made, the settlement sells them on its own behalf. The sale price of the articles include the cost of the metal, cost of charcoal required in the manufacture and the amount of wages paid and $6\frac{1}{4}$ per cent of the total cost as profit. The various kinds prepared are adukkus, pots, andas, brass cookers of various sizes, etc. Every worker is paid a cooly at the piece-rate system and an average worker is able to earn about 12 annas a day. There is a good demand for the articles manufactured here. Charcoal required is purchased in bags at Rs. 1-8-0 per bag.

At Silamalaipattai also near Peraiyur about 40 families of Kannans make brass plates, water pots and drinking bowls, cattle bells, etc. The same industry is carried on by the same caste men at Nilakkottai, Periyakulam, Uttamapalayam and other places. At Nilakkottai bell-metal gongs are also made by casting in moulds.

Ramnad District.

As at Dindigul, so in Srivilliputtur of the Ramnad district bronze kujahs and tumblers are manufactured. There are 22 persons who do this work.

• At Karaikudi there are two factories which supply the needs of Chettinad. One of the factories by name A.L.M. & Co. was started twelve years ago with a capital of Rs. 50,000. About 30 to

40 men are engaged in the factory and these workers are *migrants* from various places such as Tinnevely, Tiruppattur and Pudukalaiyam and they have practically settled down here and are paid wages according to the work done by them. The wages for manufacturing different articles vary according to the nature of the work and for things like brass andas a uniform rate of 4 annas is paid per seer. This includes the cost of charcoal which the worker has himself to supply. For nicer variety, the cooly ranges up to 8 annas per seer. The average earnings of a skilled worker amount to Re. 1 or Rs. 1-4-0 per day, while an unskilled labourer gets 8 to 10 annas. There is a steady demand for the articles manufactured in these factories as they are specially done to suit the Chettinad fashion and taste. The average production in these two firms is about Rs. 80,000 per annum. The industry is in a flourishing condition as it is in the hands of good financiers.

Trichinopoly District.

The chief centres for making brass metal vessels are Sirugambur in Lalgudi taluk and Thogaramkurichi in Kulittalai taluk. At Sirugambur there are nine furnaces with nine groups of workers of Asari caste and at Thogaramkurichi there are only three furnaces with four families of workers. The chief patterns in these places are brass kudams. In Sirugambur about 500 kudams worth Rs. 2,500 on an average are made per month. Brass sheets are purchased at Trichinopoly at Rs. 12 per maund and old brass which alone is used for making bottoms is purchased at Rs. 6 per maund.

For making a kudam weighing 15 seers, the following are required :—

		RS.	A.	P.
Eight seers of new metal ..	..	2	8	0
Seven seers of old metal ..	..	1	1	6
Fuel and soldering charges ..	..	0	2	6
		<hr/>		
Total ..	..	3	12	0
		<hr/>		

The cost of the finished article is Rs. 5-8-0 or Rs. 6. The difference, i.e., Rs. 1-12-0 or Rs. 2-4-0, is earned by a worker in $1\frac{1}{2}$ days of 9 hours each, which gives a daily wage of Rs. 1-4-0. Boys learn their work while assisting the adults. New metal required is imported to Trichinopoly from Madras. The average consumption of brass sheets is about 1,200 maunds and that of the old metal about 800 maunds and the value of the total annual output is about Rs. 30,000. The workers who are poor work for the sowcars at Trichinopoly who pay them Rs. 10 for making five kudams. They prefer this slavery to avoid the trouble involved in

finding a market for their wares. While the average cost of a kudam comes to Rs. 6, the sowcar sells it for Rs. 7 or even more getting a profit of not less than Re. 1 per kudam. The required charcoal is got from Puttur forests and Musiri taluk.

At Thogaramkurichi, however, the workers buy their required metal themselves and work independently. The wages of course work to the same rate as mentioned above as they have to waste time in selling the articles to the traders. Thogaramkurichi being in a remote corner of the district, the sowcars have not very much influence over them. In both the centres the workers feel the pinch of want of sufficient capital.

There is not much bell metal industry in this district. In Venkatanaickenpatti of Kulittalai taluk bell metal vessels such as kijas, tumblers, bells, etc., are manufactured. There are six furnaces at each of which a family of workmen do the work and the weekly production of a furnace having two workmen is about 40 seers of articles. A workman can make only 20 seers of articles in a week and is paid 6 annas per seer. The Marungapuri zamindari forests which are quite near supply fuel cheaply and Madura affords a good market for the sale of manufactured articles.

Illuppur, Trichinopoly District.

There are three groups of workers working under master workmen who employ about 50 Adi-Dravida boys. Aluminium ingots are imported from Madras and old aluminium vessels are collected and melted. Ornamental bangles, rings, chains and bracelets worn by the low class people are made. The industry originated very recently in this place. Finished articles of the value of Rs. 112 to Rs. 150 are made in four days out of 1 cwt. of aluminium costing Rs. 80 at the Madras Aluminium Factory. The freight and bandy charges come to Rs. 2-8-0. For making bangles of 1 cwt. in four days 20 persons are required working 9 hours a day. The cooly works up to 8 annas to an adult and 4 annas to a boy and each workman gets on an average 6 annas.

						RS.	A.	P.
The cost of aluminium 1 cwt.	..	..	..	..	..	82	8	0
Fuel required	..	..	..	..	..	10	0	0
Cooly	..	..	..	..	..	30	0	0
						<hr/>		
					Total	122	8	0
						<hr/>		

The master workman gets about 1 anna for every one rupee worth of article. The finished articles are polished in caustic soda and are sold at Re. 1-4-0 per lb. Articles such as rings, etc., are

sold at Re. 1-8-0 per lb. The melted aluminium is poured into thin bars, drawn as wires and hammered or twisted on simple wheels and made into ornamental things. The total output from all the factories is about 10 cwt. a month costing Rs. 1,500.

Tinnevelly District.

Making of brass and copper vessels and bronze melting has been the traditional occupation of a sect of people called Kammas. This community is distributed in Sankaranayinarkoil where there are 30 houses belonging to them, Pettai (40), Pudukudi (40), Vaigaikulam (40), Seidinganallur (10), Eral (50), Karaikurichi (5) and in Mannarkoil. All of them are pursuing this industry as primary occupation. Other castes such as Muhammadans, Maravars, Konars, etc., have also taken to this industry of late. In Pettai, which is a Muhammadan centre, there are as many as 40 Muhammadans engaged in this industry. The last census report recorded 296 men as engaged in this industry and this number appears to have very much increased during these seven years.

Most of these people depend upon the local shops or the shops in the district headquarters (Tinnevelly) for the monthly requirements of brass and copper plates (2 to 5 plates) and money to purchase karam, charcoal and other materials necessary to turn the plates into vessels and also for domestic expenses. Under this system the workers have to turn out vessels of the description required by the shop-keepers and are bound to hand them back to the very same shop-keeper from whom the advance of plates was taken. When the plates are advanced, the cost of the plates at Rs. 2-8-0 per padi (a padi being 34 palams and each palam being $5\frac{1}{4}$ tolas) is debited to the worker's account and also the advances made for purchase of wax, lac, charcoal, etc. When the manufactured vessels are handed over to the shop-keepers, a cooly of Re. 1-8-0 per padi is paid to him.

In Sankaranayinarkoil, only water pots are usually made; in Pettai and other places water pots, ordinary pots, broad vessels, kopparas, etc., are done.

The pot or kudam is made either entirely with new brass plates or with partly new brass and partly old plates. Old and broken utensils are melted and warped and used for the bottom to reduce the cost of production as the old wares are obtained at half the price of the new plates. Lead is used for fixing the upper edge of the pot or the mouth so that the rim may be thick, the quantity of lead consumed being 10 to 12 palams. Usually a group of

three or four persons join together and work under a master workman. It takes one group of men one month to work four or five plates into vessels. Out of five plates, fifteen water pots can be made on an average.

A pot is of three sections, the mouth, the body and the bottom. Each part is jointed with one another by cutting small teeth at the edge of each portion, odd teeth turned downwards and even teeth outwards. These are brought together and fixed and blended by gentle beating. Lining and polishing is done later. For the latter work a cooly of 6 annas is paid per pot while the coolies employed in shaping and beating get from 8 annas to 10 annas a day.

	RS.	A.	P.
Financial aspect—			
Cost of 5 plates of 25 padis at Rs. 2-8-0 per padi ..	62	8	0
Charcoal 4 bags at Re. 1-8-0 per bag	6	0	0
Ammonium chloride	1	0	0
Wax .. ..			..
Lac	0	8	0
Coloured earth	0	8	0

When the pots are handed over to the shop, a cooly of Re. 1-8-0 is paid per padi, the worker defraying the expenses himself and meeting the wages of coolies employed by him. Half the net earnings will cover the wages of the coolies and the other half is the remuneration for the head of the group who also works along with them.

Bronze Melting.

There are 40 houses in Pudukudi, 40 in Vaigaikulam, 10 in Sankaranayinarkoil, 2 in Narasinganallur and 10 in Seidinganallur and 5 in Eral which are engaged in bronze melting. Most of these people knew the process of making bronze from lead and copper ore but they prefer to melt old broken bronze vessels and get the alloy as it is cheaper by half a rupee per pound.

In the direct process of making bronze, lead and copper ore are mixed in certain proportions. The mixture is put in suitable mud crucibles and heated in a furnace of a bellow blowing. When the fluid is in molten state, it is poured into small shallow depressions of various sizes formed on a moist sand bed so as to obtain quantities of 10, 15 or 20 palams as the case may be. The bronze poured in the pits solidifies and takes the shape of a single convex lens.

• Before turning these bronze pieces into vessels they are heated again and with the help of seven persons are beaten into kumba talam, or vattil, all being vessels of various sizes for taking food.

While the bronze is hot these are beaten into dining plates which are specially liked by the Ceylonese. They are manufactured in this way only in Rahimanpet, hamlet of Narasinganallur. But the more common method of making these vessels is casting in moulds.

One padi of old and broken utensils costs Rs. 2-8-0. One bag of charcoal costing Rs. 1-8-0 will be required to melt four padis of bronze. The country-made crucible alone is used and it costs one anna each.

	Rs.	A.	P.
The financial aspect of casting is—			
Cost of one padi of broken bronze vessels ..	2	8	0
Cart-hire for one bandy of soft earth is Re. 1. One cart-load will suffice for 50 moulds. For one padi 12 moulds will do. The cost of the earth is ..	0	4	0
Charcoal	0	6	0
Crucibles (two)	0	2	0
Total ..	3	4	0

If one padi of broken metal is melted there will be a wastage of one seer of $4\frac{1}{2}$ palams. The net quantity obtained is therefore 30 palams. This is sold for Rs. 4-8-0 at Rs. 5 per padi. The gain is therefore Rs. 1-4-0. The bronze worker working by himself will be able to work ten padis in a month and thus earn Rs. 12-8-0. Only chombus and tumblers are turned out in Sankaranayinarkoil, while koojas, cups, broad-mouthed vessels, etc., are done in Seidinganallur and other places.

As the workers are unable to command their own capital for these industries, they have necessarily to look to the sowcars for the supply of raw materials and to abide by the conditions imposed upon them. This involves an obligation to hand over the finished products to the same capitalists. Further, the period of credit lasts only for one month and if the manufactured articles are not handed over within that period interest at 12 per cent is charged on the amount advanced. The worker is naturally very anxious to be quite independent in the matter of marketing his wares but he is handicapped on account of his indebtedness to the shopkeepers.

There is also a considerable decrease in the volume of business and instances are not rare where the metal workers have migrated from villages to distant places in search of work. The demand for hardware has gone down before the cheap aluminium and enamelled ware which are becoming more popular nowadays. The heavy weight of the hardwares and their sizes do not admit of easy transport to distant markets and considerable time of the worker

is wasted if he has to find his own market. Moreover, the transport charges which he has to meet in the first instance are perhaps beyond his means. Therefore mere credit societies having no organisations for the sale of the wares are not likely to do much good since the rural workers will be compelled to sell their wares to merchants from whom they are intended to be rescued. The condition of the workers at Sirugambur is a fine example illustrating the point.

Manufacture of iron safes and brass locks.

Dindigul town of the Madura district is famous for the manufacture of locks and safes. The locks are imitation of Chubb's patents and are purchased considerably by Government. The firm which established the industry about 50 years ago (Sankaralinga Asari Brothers) is not now existing, but there are about 20 factories in and around Dindigul which are now manufacturing safes and locks. The present owners of the various factories are said to have acquired the skill from the original founder. Iron plates required for the manufacture of safes are obtained from Madras. The work of manufacturing a safe can be divided roughly into four parts, viz., (1) rough work, (2) building the body, (3) preparing shelves and (4) fitting locks and painting. A safe of $2\frac{1}{2}$ feet high is generally sold for Rs. 140 and the details of cost are given below :—

	RS.	A	P.
Iron plates weighing $8\frac{1}{2}$ cwt. at Rs. 9 per cwt. ..	76	8	0
Cost of locks required (5)	12	0	0
Wages for rough work (two men for a week) ..	10	0	0
" for drilling holes	6	0	0
" for preparing doors complete	12	0	0
Painting and engraving with letters	8	0	0
Total	124	8	0

Thus the net gain for the manufacture including interest on capital on a safe costing Rs. 140 is Rs. 15-8-0 approximately. There is a good demand for the safes manufactured here and almost all the firms have got sufficient work on hand. The merchants are large capitalists and are running the business on a fairly large scale. The success of the business in this centre is perhaps due mainly to the presence of a large number of skilled workmen who had had training from Sankaralinga Asari who was the pioneer of this industry and the existence of a steady demand for the finished product from the wealthy Nattukkottai Chetties who place large orders for them. There are about 20 families engaged

in the manufacture of locks and the locks manufactured here are used largely for the safes that are made locally. The industry is now declining owing to the foreign competition. A cooly working in the workshop gets on an average 12 annas per day while a skilled workman gets Rs. 1-4-0 to Rs. 1-8-0.

Cheroot and Beedi manufacture.

Madura District.

Of the industries which are connected with the manufacture of agricultural products of the Madura district the most important is the making of the well-known Dindigul Cheroots.

Before the railway reached that town, most of the Madura tobacco was sent to Trichinopoly which was then the centre of the cheroot trade. The first firm to begin work on any considerable scale in Dindigul was started about 1850 and the cheroots manufactured were roughly tied in plantain leaves, packed in bamboo baskets and exported by carts. Some years later, a military officer of the Indian Army who had been growing coffee and exotic cotton and silk on the Sirumalais entered the trade. He copied the shapes of Havana and Manilla cigars, introduced wooden boxes and made other improvements. About 1890 Messrs. Spencer and Co. entered the field and they have now practically a monopoly of this trade in this district.

The tobacco required for the manufacture of cigars is obtained from the neighbourhood of Dindigul town and especially from Vedasandur and Vadamadura firkas. It is said that peculiar saltish water of Dindigul and other parts of the Madura district is specially suited for the growth of tobacco used for cigar manufacture. In addition to Messrs. Spencer's Cigar factory which employs the largest number of hands, there are many other small factories as well as individual workmen engaged in the manufacture of cheroots. Even though the individual worker is not able to compete with the bigger factories they are able to carry on the industry to some extent as they mostly manufacture cheap cigars largely in demand by the poorer classes. Since the introduction of cheap beedis and cigarettes the industry has received a set-back. There are three varieties of tobacco of which one kind is chewed, the second is made into snuff and the third used for smoking. The chief characteristic of the smoking tobacco is its ready ignition and retention of fire. This sort of tobacco is available in places where the soil and water contain nitrus salts, i.e., nitrates of potassium and sodium. Tobacco intended to be converted into cheroots is dipped for a night in pots of fermented jaggery water to which some salts are added and is taken out the next morning

and dried in shade, so that it might be soft enough for working. It is generally wrapped up in gunnies and kept under press, for a short time. When taken out for making cigarettes the ribs are removed from the stalks and leaves cut into pieces and again dried in shade, and rolled up into balls from which piece after piece is used for wrapping the cigar. Generally filling in is done by boys of ten to fifteen years of age. Country tobacco is used for filling and wrappers of locally grown tobacco used for ordinary cheap cheroots and those imported from Java and Sumatra and other places for wrapping costlier and finer cheroots. After wrapping, cheroots are put in moulds for shaping and pressed and cut to the required length and measurement and thus made fit for use. The whole work is done by hand and the wages range from Rs. 1-4-0 to Rs. 6-14-0 per thousand according to the quality of the work. A workman can make from 200 to 300 cigars of finer quality in a day. Cigars wrapped up in foreign leaves give a better appearance and flavour compared with those wrapped up in locally grown tobacco. Further the leaves imported are much lighter in weight than the Indian tobacco and the duty which goes by weight is comparatively less on those wrapped up in foreign leaf. High quality cigars are sold from Rs. 50 to Rs. 120 per thousand but there are country cigars of inferior quality made by individual manufacturers for the use of poorer classes and these are sold from Rs. 4 to Rs. 8 per thousand. Boxes required for packing cigars are made of red cedar wood obtained from the forests of Malabar. The average cost of a box which can contain 100 cigars is about one anna and these are supplied by the contractors to the manufacturers. Messrs. Spencer and Co. get boxes for their use prepared in their own workshops.

Trichinopoly District.

Trichinopoly has been famous for its cheroots and the fact that it was once a Cantonment station had much to do with the development of this industry. In Trichinopoly town, however, only crude cheroots are made by about 30 families of workmen belonging to all classes of Muhammadans, Hindus and Christians, working in groups. There are at present about 500 workmen each rolling on an average about 400 to 500 cheroots per day. Tobacco required is got cheaply from Bhavani in the Coimbatore district and is of dark brown colour.

				RS	A.	P.
Tobacco required for 1,000 cheroots weigh 3 viss						
and the cost of it is	..	..	..	1	8	0
Cooly for rolling	..	..	..	0	10	0
				<hr/>		
			Total	2	2	0
				<hr/>		

Thousand cheroots are sold for Rs. 3 and the middleman who provides work gets Re. 0-14-0 whereas the actual worker gets only Re. 0-10-0.

The next important centre where this industry is carried on, on a large scale is Woraiyur, and the cigars manufactured here captured the foreign markets at one time. About 1870, people from Pondicherry who could wrap and roll cigars more neatly with their left hands migrated to Woraiyur and rolled cigars so as to present a smooth surface and pointed edges. This kind of cigars became popular with the European population of the Cantonment at Trichinopoly and the manufacture increased and the cigars of Woraiyur began to be exported to England. Though tasteful and agreeably pungent they were dark in colour and in competition with the Havanna and other foreign brands which are lighter and have an agreeable colour, the Indian cigar lagged behind in the race. In order to overcome this disadvantage, the Woraiyur people got foreign leaves from Sumatra for wrapping and used indigenous tobacco for filling. This has been going on for the last 30 years and the Woraiyur cheroot for a time succeeded in commanding a greater sale owing to its fine surface, taste, smell, and colour but on account of the prohibitive export duty varying from Rs. 8-14-0 to Rs. 11-4-0 on a lb. of cheroots, there has been a marked decline in the extent of the industry.

The causes for the decline of this industry are (1) the heavy export duty on cheroots and (2) substitution of cheaper beedies and cigarettes. The former has adversely affected the foreign trade while the latter has stifled the trade within India. So long as the duty is not made 'advalorum' there seems to be no hope for the indigenous tobacco competing with the foreign, which is many times much lighter than Indian tobacco. Secondly with the flooding of the country with the indigenous beedies and handy cigarettes which have become the fashion of the day the demand for the ugly looking cheroots has decreased considerably and the industry is consequently declining and the workmen are not having as much work as they used to have formerly. An attempt was said to be made at Trichinopoly to grow tobacco of the Sumatra variety but the leaf came to be possessed of the same thickness and weight as the indigenous leaf. An investigation by the Agricultural department as to the possibility of producing the same kind of tobacco on the Indian soil as that obtained from Sumatra and Java may be worth its while.

Beedi Manufacture.

The industry of beedi manufacture is carried on practically in almost all places in this group where there is a large Muhammadan

population. This industry to a certain extent has given a set back to the cheroot industry. Muhammadan women are the main workers as they could carry on the work in their homes. There are two varieties of beedi leaves, Deechberry and Singareni, the former being smaller in size and the latter bigger. For manufacturing 1,000 beedies three or four bundles of the leaves of the bigger size and five or six bundles of the smaller size and three and a half palams of tobacco are required. A woman in a day could twist 1,000 beedies and earn a wage of four annas. This industry is carried on comparatively on a large scale in the Tinnevely district especially in the village of Melapalayam where there are 5,000 Muhammadan houses and all the women of these houses are engaged in this industry. It is also carried on in Palamcottah and Tinnevely town but the chief centre is Mukkadal in Nanguneri taluk where there are about 40 master merchants who deal in beedies. So far as the workers are concerned this industry provides an excellent subsidiary occupation for all the year round and involves no outlay nor does it demand any skill. At present the industry suffers for want of sufficient supply of beedi leaves which are imported from distant places and if this could be grown in forests adjoining this group of districts and a sufficient supply made available, the industry will have a better future and give steady employment to those who observe purdah.

Bangle Making.

Bangle making from lac, as an industry, once existed in a flourishing condition in Trichinopoly town, Thiruvanaikoil and Puttanattam of Kulittalai taluk. It is now fast disappearing or has completely disappeared on the advent of fine and cheap glass bangles from Austria, Germany and Japan. The only place where it has survived is Trichinopoly town, but it is now carrying on a lingering existence and will no doubt, before long, perish.

There are now only three groups of workers in the market street of Trichinopoly and one Muhammadan widow at Woraiyur who make the bangles. Each group consists of four workers. Black glass bangles are taken on to a handle consisting of three sticks held horizontally and black lac is gently drawn over it while in melting condition. Red lac is then applied over it and the outer surface is decorated with cut glass pieces, copper foils and tinsel. These bangles are sold at the rate of 2 annas to 12 annas a dozen according to the value of the material used and the labour involved on it. The cooly for making a bangle is 25 per cent of its value. The workers are Muhammadans. While the women attach tinsels over the bangles, the work of coating with lac and polishing the bangles

to a finish is done by the men. Eight dozens of finished lac bangles worth Rs. 6 weigh 144 tolas, the glass bangles that form the frame work weighing 66 tolas, glass pieces and tinsels 24 tolas and the lac about 54 tolas. A maund of lac costs about Rs. 40.

		RS.	A.	P.
The required lac for eight dozens costs ..	..	2	8	0
Do. tinsel costs .. ..	..	1	0	0
Do. wages cost .. ..	..	1	8	0
		<hr/>		
Total ..	..	5	0	0
		<hr/>		

This number is done in three days. A labourer gets about 8 to 10 annas a day, which includes the wages for the female worker who attaches glass pieces and who is ordinarily his wife or his female dependent. As there is no great demand for these bangles, there is work only for 20 days in a month. On an average, about Rs. 4,000 worth of bangles are made by all the workmen at Trichinopoly in a year and sold locally to Muhammadans and some Hindus who have got a special liking for them. Hawkers from the Tinnevely district, especially from Maremangalam in Srivai-kuntam taluk, purchase them for vending in their villages. Formerly there were 25 groups of workers consisting of about 150 persons doing this work in that village, but owing to the change of fashion and introduction of cheap refined bangles with glaze, the demand for this kind of bangles has dwindled. The workers have all emigrated or have taken to other professions such as cart-driving and agricultural labour. The industry is slowly dying and there seems to be no hope for improving or reviving it as lac bangles have gone out of fashion.

Similarly Tirumangalam, Periyakulam and Melamangalam of the Madura district and Maremangalam of the Tinnevely district were centres of manufacturing bangles from lac by Gazulu Baliyas, but in both these districts the industry is dead and the reason for it is obvious. There is no room for such a crude industry at a time when glass bangles with golden hue so closely resembling gold bangles and capable of maintaining the colour unchanged for any length of time are coming into the market. There is no bangle industry in Ramnad.

Toy or Doll Industry.

This is carried on in a number of important places of pilgrimage. In such centres generally various small industries flourish, pilgrims being anxious to carry some memento with them. A few among

the industries are toy industry at Madura and doll making in Rameswaram and Srirangam. A brief account of them is given below :—

Madura District.

In the village of Iravadanallur, two miles from the Madura town, the industry of making toys with wood has been in existence for some time past and there are five families engaged in it as whole-time workers. They get the variety of wood required, viz., 'palai' from Alagarkoil, Sirumalai and Nattam at Rs. 25 per cartload, delivered at Madura. Generally a cartload contains about 100 pieces each 16 inches long and 4 inches in diameter. Four or five workers join together and purchase a cartload at a time. The articles made out of this wood are wooden toys, balls, saffron cups, kolattam sticks and cradle gratings. They are made by turning the wood on a lathe while it is green and moist and dyed with lac, saffron and other colours. Articles of domestic crockery for amusement of children are also made; each set of 16 costs 4 annas. Four sets are made in a day, the workers (a turner and a coolie) earning 10 annas a day. The articles manufactured are sold wholesale to the traders in the Sri Meenakshi Temple, who sell them in retail at the temple booths at a profit of 2 annas per set or 50 per cent of its value. The workers do not carry on sales direct with the consumers but are satisfied with the price they get at their doors. The implements for their work are very simple, consisting of a wheel costing Rs. 2 and a few chisels worth about Rs. 8.

Ramnad District.

The island of Rameswaram is one of the biggest centres of pilgrimage for the Hindus from all parts of India. Here the industry of doll making was started some ten years ago. There are at present seven families engaged in manufacturing dolls. The process of manufacture is very simple and the raw materials required are very easily obtainable and cost very little. The main articles required for making these dolls are cowdung and tamarind starch. Tamarind seed is converted into starch and then mixed with cowdung and cast into figures in different moulds. Originally the workers bought these moulds from elsewhere but now they could make them. After a figure is cast, it is coated with white earth which is locally available and then painted with colours to give attractive appearance. Generally a man can paint 25 dolls in a day provided they are kept ready dried. If all the processes have to be done by a single man, he can prepare 100 finished dolls at the end of a week. The price is Re. 0-1-0 for all kinds of dolls of a class or variety.

Economics for 100 dolls.

		RS.	A.	P.
Cow dung 4 tins at Re. 0-2-0 per tin ..	..	0	8	0
Tamarind seed 1 measure for making starch ..	..	0	1	0
Paints .. .. .	..	2	8	0
		<hr/>		
Total ..	..	3	1	0
100 dolls are sold at Re. 0-1-0 per doll ..	..	6	4	0
		<hr/>		
Difference ..	..	3	3	0
		<hr/>		

The difference, i.e., Rs. 3-3-0 represents the wages of the maker for one week. The average wages earned by the maker are about Re. 0-8-0 per day allowing one day for rest. All these makers have got their own shops at the Rameswaram temple where they expose the dolls manufactured by them, along with other articles and are able to find a sale for them without much difficulty. On an average each maker is able to market about 4,000 dolls in a year and the total output of the place exceeds 40,000 dolls in a year. The industry though of recent growth is in a flourishing condition and gives employment to a dozen families.

Trichinopoly District.

As in the Madura and Ramnad districts, so in Srirangam town of the Trichinopoly district, the manufacture of dolls from earth and painting them with water and oil colours is carried on by a single family. This family of four males and two females migrated from Pondicherry about a year ago and settled there. Having no competition to face, the makers have an easy market for their articles. The worker is a potter by caste and has his usual hereditary skill in the art of manufacturing articles from earth. The earth required is got from patta lands on payment of 6 annas per cartload and the figures and shapes intended are made by hand and passed through moulds of different kinds made of cement and asbestos and then mended and burnt in kilns and afterwards artistically painted with different colours. The main articles manufactured are birds of different colours, animal heads, epic pictures such as Rama, Sita, Lakshmi, Krishna, etc. They are locally sold and are occasionally exported to Madura and Tanjore. As there is a continuous flow of pilgrims to the place throughout the year, there is no difficulty in the matter of finding a sale for the manufactured goods. The worker is able to make goods worth about Rs. 200 a month with the assistance of the members of his family. The women prepare earth for the moulds while casting and painting is done by the men. For manufacturing dolls worth Rs. 2 the cost of raw material, viz., earth,

dye, fuel for burning the kilns, etc., does not exceed Rs. 1-1-0. The family is able to make a decent living from their trade. So far as the development of this industry is concerned, I have no suggestion to make as the makers have both capital and skill for their trade and have no difficulty in finding sales for their wares.

MINOR INDUSTRIES.

(1) *Manufacture of Lace and Velvet Caps.*

This industry is found to exist in important centres of Muhammadan population, especially in the Trichinopoly town of the Trichinopoly district and Kilakarai of the Ramnad district.

Trichinopoly District.

At Trichinopoly, there is only one group of five members consisting of three males and two boys of a Muhammadan family belonging to Madras who are engaged in the manufacture of caps with ordinary cloth and fur. They have been working for the last six months on behalf of a firm known as "The Rangoon Shop, Trichinopoly" in Palakarai. The instruments required for the manufacture are very simple, consisting of a Singer Sewing Machine and twenty wooden moulds. Each workman is paid 12 annas a day, according to the amount of work turned out by him, and all the five workers are able to produce Rs. 50 worth of caps per day or Rs. 1,000 on an average in a month. The necessary raw materials, such as velvet, lining cloth, cardboard, and thread, are supplied by the firm to which the manufactured caps are handed over. The latter sells them locally and also exports them to Rangoon and other places where there is a large demand for them. A cloth cap is generally sold from 6 to 8 annas, a velvet cap from 12 annas to Rs. 1-4-0 and a fur cap from Re. 1 to Rs. 1-12-0.

Ramnad District.

Kilakarai is a big village on the south coast of the Ramnad taluk with a large population of Muhammadans and is noted for the manufacture of fine and costly lace caps, for use by Mussalmans, especially at the time of marriage. There are only two houses engaged in the manufacture of such caps. Lace required for manufacture is obtained from Madras and the price of a cap depends upon the lace used in it. Wages for making lace caps are paid according to the amount of lace used in it, that is, 4 annas per tola of lace used. The workers are able to prepare as per designs given them. In a year only about 30 caps

are made and the industry is carried on as a subsidiary occupation, the demand for such costly caps being only seasonal on marriage occasions. Lace required for the work is generally purchased from Madras at Rs. 1-8-0 to Rs. 1-12-0 per tola.

(2) *Painting.*

Among the many industries that have risen in pilgrim centres, painting of Hindu mythological pictures on planks and glass is one. Srirangam of Trichinopoly district and Rameswaram of Ramnad district are the chief centres where this industry is carried on. At Srirangam there are two master-workmen who belong to Nayudu caste, living near the Srirangam temple, engaged in this industry. Each workman has got two assistants under him. They paint skilfully on planks in Carnatic style pictures of Hindu mythology with water colours. The planks are 50 by 36 inches, 40 by 30 inches, 30 by 24 inches, 24 by 18 inches and 20 by 16 inches. They use gold leaf, glass pieces with tinsels. Colours required are got from Madras. There is a large demand for these pictures from the northern country created through the advertisement of pilgrims who purchase them. This art has been practised for more than three generations in this family and the worker is able to produce about Rs. 400 worth of goods in a month.

Economics for the manufacture of goods worth Rs. 400.

					RS.	A.	P.
Planks .. .. .	..	..	..	..	20	0	0
Colours .. .. .	..	..	..	..	30	0	0
Gold leaf .. .. .	..	..	..	..	100	0	0
Frames and glisses ..	..	..	..	..	100	0	0
Cooly for two assistants and one boy ..	..	..	..	..	50	0	0
					<hr/>		
Total .. .. .	..	..	..	..	300	0	0
					<hr/>		

Earnings of two workmen or gain is Rs. 100 or earnings of one man for a month is Rs. 50.

Ramnad District.

At Rameswaram temple there are two workmen who do painting on glasses of the images of various gods such as Rama, Lakshmana, Siva, etc. The worker marks on the glass with the help of a tracing paper the image of the god and then works with colours. On an average one worker is able to do six figures in a day and earn a wage of 8 annas to 9 annas a day. The capital required is very small ranging from Rs. 50 to Rs. 100 and is provided by the workers themselves who pursue this industry as a subsidiary occupation during leisure hours while running

their own glass shops. Ordinarily a picture is sold from 8 to 10 annas and the cost of the materials is as below :—

						RS.	A.	P.
Glass	..	..	..	..	..	0	2	0
Colours	..	..	..	..	..	0	2	0
Frame	..	..	..	..	..	0	2	0
Total						0	6	0

Thus for every picture the painter earns 2 annas to 4 annas according to size.

The workmanship especially of the paintings at Ramnad is of very ordinary kind and the pictures are intended for cheap sales to pilgrims.

(3) *Wooden Statue.*

There is a Roman Catholic Christian carpenter living in the village of Vadakangulam in the Tinnevely district who manufactures wooden statues of Biblical personages out of a wood called 'Mavilanga' which is available locally and in the Travancore forests. This worker is getting orders from the various Missions which lie in and around Vadakangulam and thus keeps himself fully engaged. He earns on an average Rs. 50 per mensem. He has learnt the art from his father who learnt it from a French Missionary who came to Vadakangulam.

(4) *Silk Rearing.*

Silk rearing has been started on a small scale by the Mission at Vadakangulam as it was found that mulberry could grow well and the climate is suitable for rearing silk worms. The Mission has cultivated mulberry on $1\frac{1}{2}$ acres and the growth is luxuriant. Seed cocoons are got from Kollegal and are reared under the supervision of a Sericultural Assistant of the Department of Industries. The first rearing of cocoons was commenced on 20th November and closed on the 25th December, 1927. The cocoons are sent to Madras for twisting as there is no reeling plant in the Institution. The Sericultural Assistant could not show better results in rearing worms as he had no microscope to examine their condition and to differentiate the diseased from the healthy. It is now too soon to say how the industry will progress in the future.

(5) *Wood Carving.*

The wood carving of Madura Town has been of ancient growth due to the influence of carvers from the Bombay side, Mysore and Western India encouraged by the ancient princes who ruled

over this Town. It has managed to survive in this historic city to the present day by the patronage of wealthy merchants who are many in number and has acquired more than a local reputation. The beautiful carving with the skill of the workman can be seen over the doorways of some of the better houses and also in the Kalyan Mahal in the Meenakshi Temple and on the cars belonging to it. At present there are 3 houses which are engaged on this work and they manufacture artistic tables, elephant heads, etc., in rosewood. The workers belong to Asari caste and are able to earn a daily wage of Rs. 1-4-0 per head. To make an elephant head costing Rs. 10 half a cubic foot of wood is required and this costs about Rs. 2-8-0. A skilled artizan will take 5 days to complete it and has to be paid wages at Rs. 1-4-0 per day. Thus the net profit for making an elephant will be Rs. 1-4-0 if sold immediately. As these articles are purely fancy ones it is not possible to market them easily and so they are chiefly prepared to order. When there is no demand for such articles, the workers engage themselves in the manufacture of articles of furniture. Fancy articles such as carved tables, elephant heads, etc., are generally sold to Lutheran Mission people who purchase them for sale abroad or to the Victoria Technical Institute, Madras. There is also a local firm dealing with these things in Madura.

(6) *Making of brass, silver and horn insects.*

There are 3 or 4 families of Asaris who carry on the manufacture of artistic works in brass, silver, ivory and horn inlaid with silver, such as, making various kinds of insects which command a good sale during Christmas season especially among European population. About 40 different kinds of insects are made and a set of 12 in brass is generally sold from Rs. 12 to Rs. 15. The brass required for making 12 will be worth Re. 1 but the time taken for making 12 insects, i.e., one set will be about 8 days at the least, for two men working at it. This kind of work is done before Christmas season and if there is no demand for the finished articles during that time, they are sent to the Victoria Technical Institute, Madras, for sale on a commission of 2 annas per rupee. The workers have acquired special skill in the manufacture of these curios. They first cast the rough shapes of insects in metal in moulds warped with wax and then work with hand with iron files, chisels, and needles, etc. As this work will not keep them engaged throughout the year, they manufacture small brass vessels for domestic use and sell them.

The Asaris do not stand in need of financial help. They have got houses and property and are able to find capital of their own for their work. They have catalogues of prices for their makes

and advertise them though not very widely. The Victoria Institute makes annual purchases from these men and help them in marketing their articles.

(7) *Making of fish nets.*

In almost all the coast villages in the Ramnad and Tinnevely districts fishing is carried on as a primary occupation by a class of people called Paravars, and by Muhammadans and Hindus as well.

The profession of fishing has naturally developed the making of fishing nets in some of the coast towns, like Dhanushkodi, Kameswaram, Devipatnam, Anjengo, Tanganasseri and Manapad. In places other than Manapad mill made yarn alone is used for the making of nets. But in Manapad a fair proportion of the nets are made out of handspun yarn and the fishermen claim that nets made of handspun yarn last longer than those made of mill yarn. Greater portion of the nets are made of coconut coir and the central portion alone is made of cotton threads. The yarn used for preparing nets is generally of 12s to 20s. A kali of yarn is purchased at As. 10 and can be converted into 10 mahls and the charge for making it is about an anna. Knitting of nets is done mostly by the womenfolk and the men attend to it only in their spare hours after fishing. Fishermen are seen knitting while going on roads. The cost of an average net will be about Rs. 100, the material required being Rs. 10 worth of coconut coir and Rs. 34 worth of yarn. The remainder represents the wages. The yarn required for a net is not purchased all at once. At a time the fisherman purchases one or two kalis from his savings and works with them. Again he purchases another instalment and continues his knitting until he is able to complete it. The work is spread over a period of 3 to 6 months.

Fishing is carried on by master fishermen who engage coolies in fixed monthly wages ranging from Rs. 10 to Rs. 15 in addition to feeding them. For making a net worth Rs. 250 thirty persons will be required to work for a period of one month. Catching season generally commences in February and lasts till September. During the off season they attend to repairs of the nets and also engage themselves in preparing fresh nets.

(8) *Pottery.*

Pottery is one of the important crafts of a village and is found to exist in almost all the villages. The profession is generally carried on by a class of people called Kummaras or Kosavans who cater to the needs of the villagers. The earth required for making pottery is generally obtained from tanks in villages free of cost.

Though this industry is carried on in many centres of this group of districts the quality of earth found at Manamadura gives a better glaze to the pottery done there and makes it distinctly superior in appearance and durability.

There are about 100 families of potters living in the village all engaged in the manufacture of pots and they supply the needs of the surrounding villages and send even to places like Karaikudi and Devakotta. The pottery manufactured are of fine quality and of bright red colour. Even though the earth is removed free, yet the workers have to pay Re. 1 to Rs. 1-8-0 as cartage for bringing it to the workspot. Coating with finer clay is done on the day of firing the kiln. Workers have got kilns owned by themselves jointly and individually as well. The fuel used is very cheap and gathered mostly. A sum of Rs. 10 is spent for preparing pots to fill a kiln which, when burnt will give finished articles for Rs. 25. For preparing a kiln-full of pottery, it takes ten days for 2 men and 2 women and the wages earned by all these put together are Rs. 15 or Rs. 1-8-0 per day. For obtaining fine varieties of pottery, the workers mix different kinds of earth and sand in various proportions, 4 parts of red earth, 1 of black, 1 of brown to which alluvial sand and ordinary sand in small quantities are added.

Due to the fine quality of earth available in the locality, the industry of manufacturing tiles after the pattern of Mangalore tiles has come into existence and a company was established about five years ago with 16 shareholders having an aggregate capital of Rs. 19,200. There is enough raw material available in the zamindari lands of Sivaganga Zamindari for the industry to be carried on successfully. The tiles manufactured here do not appear to be of inferior quality and there is good demand for them from Chettinad which is so very near. The manufacturers are able to sell them cheaper by Rs. 10 per 1,000 than the prices quoted for similar manufactures elsewhere. The industry is in a flourishing condition and has got great potentiality for further development.

The village potter turns his pot on the old primitive wheels which he has to rotate with his hand. As the revolutions become slower, he has to give fresh movements to the wheel. A contrivance such as a treadle by which the wheel may be kept turning during the whole operation so as to enable the potter to use both hands in shaping and moulding his pottery may be a desirable improvement in his plant. His kilns also require improvement so as to economise the consumption of fuel. The Indian pottery lacks in strength and glaze. A chemical earth which would improve these qualities may greatly enhance its usefulness. At Karai in the Perambalur taluk of the Trichinopoly district, a white clay is available out of which

glazed kijas and other articles are manufactured. An analysis of its composition and the possibility of converting it into porcelain may be undertaken and examined.

(9) *Oil Pressing Industry.*

Oil pressing by country ghanis is carried on in almost all the villages of the districts under report. The chief oil seeds grown are gingelly and groundnut; oil from nim, castor and ippe is also extracted to some extent. The extraction or expression of oil is carried on mainly by a class of people called Vaniyans who carry on this profession from time immemorial. Even though gingelly oil is expressed in all the four districts it is done on a large scale in the Tinnevely district, especially in Pettai, Kalladai-kurichi, Sermadevi and Tenkasi. Pettai is the biggest centre having about 60 mills. The mills are of primitive type consisting of a mortar made out of a single stone with a wooden pestle worked by two bulls. There are about ten wholesale merchants at Pettai who get gingelly stocked during the harvest season of the crop, i.e., March. Gingelly grown locally is sufficient only for four months' work and so it is imported from distant parts of the Presidency. A bag of gingelly contains sixty Madras measures and this is put in a mill in two instalments as the capacity of the mill is only thirty measures at a time. Vaniyars get gingelly from the wholesale merchants and sell oil locally and also to the merchants who carry on trade with different places.

Financial aspect of the industry.

	RS. A. P.
Cost of one bag of 60 measures of gingelly seed ..	22 0 0
Cooly for two men at the mill	1 0 0
Interest on the capital outlay for a day	0 4 0
Feeding charges for a pair of bulls	1 8 0
Palmyra jaggery 1 tulam (100 palams of 5½ tolas each)	1 2 0
Total ..	25 14 0

Yield of oil out of sixty measures of gingelly is 18 measures and 6½ tulams of oil cake and will be sold.

	RS. A. P.
18 Madras measures of oil at Rs. 1-4-0 per measure	22 8 0
Selling of oil cakes 6½ tulams at Rs. 1-1-0 per tulam	6 14 6
Total ..	29 6 6

Thus the net gain is Rs. 29-6-6 minus Rs. 25-14-0 or Rs. 3-8-6. If the mill is owned by the worker this gain goes to him but if the mill belongs to a merchant he has to be paid a monthly rent for using the mill. The Vaniars as a class are indebted considerably.

Groundnut Oil Pressing.

At Aruppukottai in the Ramnad district there are about 500 country ghanis engaged in pressing oil from groundnut which is the chief oil-seed of the district. A ghani is able to crush 20 Madras measures of groundnut (55 lbs.) yielding $5\frac{1}{2}$, 6 or $6\frac{1}{4}$ measures of oil according to the quality of the seed. In a day pressing is done 6 times and for each pressing 12 annas have to be paid which include the charges for the bulls and wages for the man engaged. It yields a tulam or 31 to 32 lbs. of poonac or oil-cake which is used as food for cattle as well as manure. It is exported largely to Ceylon for use as manure for plantations. The oil pressed is exported to Madura, Dindigul, Tinnevely and other places. A kotta of groundnut (96 Madras measures) will yield 40 measures of shelled kernel weighing 10 lbs. 20 measures of shelled kernel will yield 22 lbs. of oil and 31 lbs. of cake, remaining 2 lbs. being wastage. Here shell decorticating is done largely by women coolies, who beat the shell with sticks and separate the kernels. This method of decorticating by hand is preferred as most of the produce is consumed locally and the transport charges to and from the mills are saved besides the value of the husk which the owners could retain for themselves, which they cannot do when the work is done in mills. The husk thrown out of a kotta of groundnut generally sells for Re. 0-1-4 and is used for fuel purposes.

This industry can very well be organised on a co-operative basis at Pettai, Tenkasi and Aruppukottai where there are large number of ghanis working. The seeds required for consumption may be purchased at one time during the harvest season when prices are the lowest and distributed to the members of the Society according to their monthly requirements. The Society may also be able to express oil on a co-operative basis, working iron ghanis with power or using an Anderson Oil Expeller. The percentage of outturn of oil will then be largely enhanced. The Industries department is now conducting an experiment in pressing oil by power with an Anderson Oil Expeller at Kallakuruchi in the South Arcot district and the results may be awaited.

(10) *Chanks and Chank Beads.*

Tuticorin in the Tinnevely district and Rameswaram in the Ramnad district are best known for their chank and pearl fisheries which are worked by the Government. Pearl fishing is a periodical

occurrence but the chank fishing is done almost every year. Divers for fishing reside in large numbers at Kilakarai in the Ramnad district and are employed for the purpose both at Rameswaram and at Tuticorin. Divers are also free to dive and catch chanks but the catch should be made over to Government at one anna per chank of a required size. If it is below that size it is thrown back into the sea for further growth. A diver generally earns from Re. 1 to Rs. 1-8-0 per day but when he is specially lucky in his catch he can earn even Rs. 5 or Rs. 6. Chanks thus collected by Government are disposed of by Government by inviting tenders for their purchase. Merchants from Dacca and Bengal are the principal purchasers.

At Dacca these chanks are converted into ornaments of various sizes. They are in good demand in Bengal where there is a religious custom that girls, married women and widows should wear particular kinds of ornaments made of chanks suitable to the various stages in their life. This religious custom has stimulated the demand for chank ornaments. Though chanks are available in large numbers and collected in these parts they are not made use of by the South Indian women as ornaments of value to any extent except by the women of the Lambadi caste. One of the chank shops at Rameswaram had Rs. 50 worth of chank bangles imported from Dacca which had not been sold for the last one year. This is the main reason why this industry has no place here.

At Tirupallani, however, there are about 15 houses engaged in the manufacture of beads from chanks. These workmen have no skill and their products are very crude. Their method of cutting and polishing them is also very rough. They cut the chanks into small pieces by iron chisels or saw them and put them into a stone mortar and rub them with a stone. When the pieces become smooth they bore them with holes and make them into beads. Similarly rings are manufactured. Milk chanks are polished by rubbing them against whet stones. A thousand chanks are polished in a month by a family and a sum of Rs. 15 is earned as wages. The Labbai merchants at Kilakarai purchase chanks from Ceylon where the waste product is sold cheaply and distribute them to cottage workers for polishing them and turning them into beads, rings, etc. A cooly of Re. 0-2-9 is paid for making 500 beads and Rs. 1-8-0 for 1,000 rings. A day's time is required for the former and 10 days for the latter. A thousand chanks are sold at Rs. 20 to Rs. 35 at Ceylon. The Kilakarai merchants carry on trade in chanks and their products. They export beads, rings, etc., mostly to the Bombay Presidency where low caste people wear them. Milk chanks are largely used for feeding milk to children and for tying to the face of bulls.

(11) *Tanning Industry.*

There are about 50 families of chucklers in the village of Kothapatti of Dindigul taluk in the Madura district and of them only three families are engaged in tanning. Two families have lands worth about Rs. 400 to Rs. 500. Others have mere thatched houses of very little value. Labbai merchants who have tanneries make contracts for purchase of hides directly from slaughter-houses or from collecting agents while those that come into the market are of poor quality. These chucklers purchase the latter in the market and tan them at their houses. The process is the same as that followed at the tanneries but the period allowed for soaking in lime and avaram bark solution is shorter by five days. A chuckler is given a wage of 6 annas for tanning a skin besides a sum of Rs. 2 to 3 to meet expenses in tanning, according to the size of the hides. Tanning as a cottage industry is almost dead and where it is still lingering it is bound to die soon. In the first place the tanners have no capital and they cannot buy good and undamaged hides. They are obliged to bring only the refuse rejected by the tanneries. Again the whole operations have to be conducted in open air and the skins exposed for drying to the sun and weather instead of being dried in shelter. Further the cottage workers have no money to buy the best tanning materials. Consequently, tanning in cottages is bound to be inferior in quality and it is no wonder therefore that the industry is dying. Chucklers who work in tanneries feel that their position is more secure and can earn better wages. Tanning is therefore better suited for being worked on factory lines.

(12) *Boot and Shoe Making.*

Of the various places in this group of districts, Trichi Palakarai of Trichinopoly town is the biggest centre for making shoes, boots, sandals, bedstraps, belts, money purses and other articles out of leather. Pallapatti in the same district is also a place where such articles are manufactured. There are about 30 tanneries in Trichinopoly for exporting hides but tanning is not done as a cottage industry by any person. The shoe-makers get the required tanned leather and give them to the chucklers who are Adi-Dravidas and who are about 300 in number. They work under sowcars who pay them wages of 10 to 12 annas a day. Each group of people three or four in number produce goods worth Rs. 12 to Rs. 15 in a day by working from 7 a.m. to 6 p.m. with an interval of one hour in the midday. The goods manufactured are sold locally and exported to adjacent districts and even to Straits Settlements. The sowcars who get the work done by the chucklers do exploit their

labour and the ignorant worker gets very little remuneration commensurate with the quantity and quality of work done by him, but even this he wastes by his craze for drinking. If educated members of the Adi-Dravida community could take steps to organise these people and conduct the industry on a co-operative basis, there is good scope for this class of workers to get better wages as they have a hereditary skill in the art which others could not easily acquire.

(13) *Hosiery.*

Hosiery manufacture, though it can be carried on as a cottage industry by small groups of workers, is generally done in factories where large number of persons work and with power-driven machines. This industry is of recent growth and is being encouraged by the large demand for goods of the kind. There are four places in the Trichinopoly district, i.e., Srirangam, Karur, Chinnadharapuram and Pallapatti, and in Madura town where there are factories engaged in manufacturing hosiery goods mostly banyans. The factory at Madura engages about 60 persons and is able to manufacture 90 dozen in a day and those at Karur employ about 40 workers. The workers at Madura are mostly Christians and Sowrashtas and those in the Trichinopoly district are Muhammadans and Hindus. All the machines that work in the Trichinopoly district are worked by hand and those who work at the machines get an average monthly wage of Rs. 20 to Rs. 22½. Tailors who are called finishers are paid from Rs. 10 to Rs. 20 per month and boys from Rs. 5 to Rs. 10. The workers at Madura are paid wages at the rate of 8 annas to 12 annas per day. The yarn used for manufacturing banyans is 20s and 30s and these are obtained from the local mills at Madura. Coimbatore mills supply Trichinopoly factories. The goods manufactured are sold locally and exported to all parts of the Presidency and a large quantity to the Northern India. The factories at Madura and at Karur are managed by big capitalists and those at Srirangam and other places are run by master workmen of limited means. This industry seems to have good prospects owing to the large demand for banyans and it can give employment in leisure hours to the female population of the middle class as each family can own a small knitting machine which may not cost much and the art can be learnt easily with some training. This is one of the few cottage industries which can be introduced to give work during leisure hours with advantage, especially to women of all ranks. There should be an agency to collect the manufactured goods from each individual worker and market them on a co-operative basis.

(14) *Manufacture of Chunam.*

The manufacture of chunam out of sea shells is prevalent in almost all the villages bordering sea coasts. At certain seasons of the year shells are rippled into the shore by the waves and are gathered by a class of people who live very near the shore and is converted into lime in kilns constructed for the purpose. These kilns generally lie very near the coast to avoid transport charges. Brushwood, palmyra leaves and tumma fuel are used for burning the kilns. Capacity of the kilns varies according to the size of the kilns. The average earnings of a family working in this industry are only about 7 annas per day. The Local Boards levy small license fee for burning lime but even this small amount affects the poor workers to such an extent that they feel the tax a hardship. If this could be removed it may give them some relief.

NEW INDUSTRIES.

In the Sirumalai hills of the Madura district there is spontaneous growth of a grass called 'Lemon grass' from which oil can be extracted. This grass has a fine agreeable fragrance and the oil extracted can be used for medicinal purposes. The possibility of extracting oil from it may be further investigated.

Parts of the Tinnevely district adjoining the Western Ghats are on a high plateau possessing irrigation facilities. The possibility of introducing Sericulture in these parts may be investigated, if the results of the experiments carried on at Vadakangulam in the Nanguneri taluk prove successful.

Though there is an abundant growth of coconuts in the Madura, Trichinopoly and the Tinnevely districts, coconut husks are not turned to account except for use as fuel. There are, however, no facilities for retting husks in these districts but still the dry method of removing fibre as followed in parts of the Ramnad district may with advantage be tried in these districts.

Trichinopoly and parts of Tinnevely have a large area under plantains. After plantain bunches are cut, the whole trunk of the tree is practically wasted. The possibility of extracting fibre and turning them into yarn for manufacturing cloths is worth investigating. The fibres resemble imitation silk and if only they have the necessary strength they could form a good material for weaving.

*Special Officer,
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