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Report on the
Survey of Cottage Industries
in Bengal

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REPORT ON THE SURVEY OF COTTAGE INDUSTRIES IN BENGAL.

PRESIDENCY DIVISION.

(Districts—Calcutta, Howrah, 24-Parganas, Jessore and Khulna.)
Cotton weaving.

Textile and allied industry.—The weaving of cotton fabrics from yarns of coarse medium and fine counts in the above districts is done by weavers on hand looms of two types, viz., (a) throw-shuttle or primitive looms, and (b) fly-shuttle looms. Prior to the Swadeshi movement, throw-shuttle looms were practically used throughout these districts. The unrest caused in the country by the movement had the effect of several hundreds of looms of the Serampore fly-shuttle type originally introduced by the Danes, being adopted by the weavers. With the introduction of the fly-shuttle looms, the weavers found that the output of their looms was doubled and in many cases the quantity of cloth which was produced on a throw-shuttle loom was tripled. The number of fly-shuttle looms has since steadily increased during the non-co-operation period, which gave it a further impetus, fly-shuttle looms have been introduced into almost every weaver's hut.

The chief centres of weaving in the district are—

Calcutta—Simla and Goabagan.

Howrah—Andul and Uluberia.

24-Parganas—Poora and Baduria.

Jessore—Kotchandpur, Jessore, Madhyakul, Keshabpur and Rajarhat.

Khulna.—Phultola, Bardal, Moorleganj, Bagrehat, Mauguria and Dumria.

The principal hand-weaving centres in the district of Howrah may be called extensions of the Serampore area, these being mainly in the northern part of the district within the jurisdiction of thanas Domjur, Jagatballavpore, Amta, and Bagnan. The villages of Begri, Banyapara and Khatora in thana Domjur, Khalna in Amta and Khajurji, Kalyanpore and Karia in Bagnan may be specially mentioned. Coarse and medium fabrics are generally woven at these places and the industry has received an impetus by the interest taken by the people for indigenous goods. The fine weaving done in the Satkhira subdivision of the Khulna district is reported to be decaying. Baksa and Narayanpore are the most important centres. In Jessore weaving is carried on in Siddhipasa, Lakshimpasa, Madhyakul, Dhandia, Salbaria, Attapole, Bidyanandakati, Rajarhat, Nilgunge and Keshulpore. Among these villages about 130 families of weavers in Siddhipasa have specialised themselves in the weaving of fine *chadars*, mosquito curtains and coloured check cloths known as *relly doorys*. Mosquito curtains are also woven in Barasat, Bagnan and a few other important places.

There are several villages in the above districts where good cotton cloths are manufactured which find a ready sale both locally and in the Howrah Hât.

For the manufacture of the finer fabrics, imported yarns ranging from 40's to 150's counts are used, whereas for medium and coarse fabrics Indian mill spun yarns purchased from Suttaputty (Calcutta), are used.

The number of cotton weavers employed in these districts are as follows:—

Howrah	...	...	2,592
Calcutta	...	...	516
Jessore	...	...	7,361
Khulna	...	...	4,968
24 Parganas	...	...	6,851

As regards the present condition of the industry, it may be stated that it is not in a very prosperous condition owing to the competition it has to face with imported cloths which are readily available in Calcutta.

Silk Weaving.

Little or no silk weaving is done in any of the districts under report except that silk is used for ornamentation of some of the fabrics or as borders for the more expensive *dhutis* and saris.

Hand Spinning and Weaving.

Before the Gandhi movement of reviving hand-spinning, all the yarn that was used by the cottage weavers was mill-spun. It either was obtained from the Indian spinning mills or, if there was a demand for finer counts, imported yarns were used. If through the present movement the *charka* gradually forms an integral part of industrial life in the villages, its effects will be far-reaching. It will afford a means of utilising the leisure hours of agriculturists whereby they will be enabled to effect some economy in their domestic budget. The successful working of the *charka* practically depends on two factors, *viz.*, the supply of suitable cotton at a nominal cost and a desire on the part of the cultivators to use home-spun and woven cloths. The first depends on the widespread cultivation of cotton, or better still, on the growing of sufficient cotton by the cultivators for their own consumption. If this can be effected, much of the cotton of Bengal will be used up in clothing the people. It seems, therefore, that the economic position of the spinning wheel is more complicated than what appears on the surface. The primitive *charka* can spin yarn of low counts as well as the highest, but, being a hand-driven machine, the uniformity of the yarn depends greatly on the experience of the throwster.

Attempts have been made to improve upon the primitive *charka*, but these have mostly been in the direction of polishing and varnishing them without any change in the mechanical arrangements. In this connection, it may be stated that the *charka* designed by Ramdhan Bairagi of Berchampa deserves special mention. He has divided the processes into two operations, *viz.*, carding and spinning. Two distinct machines are

used for this purpose. The resulting yarn is of more uniform thickness and by a simple adjustment a wide range of counts can be spun.

Women very often help in the preparatory operations of weaving. In preparing the warp for 16 to 20 pair of *dhutis*, 18 days' regular work is required. The cost of preparing the yarn for one pair of *dhuti* amounts to 8 annas and for weaving Rs. 1.8 is charged. An expert can weave 6 to 10 yards of *dhuti* cloth with 40's counts of yarn on a fly-shuttle loom per day of 8 to 9 hours; but if a year's average is taken, it comes to 5 yards a day. For purposes of calculation, it is safe to assume that a weaver can produce a cubit of such cloths in an hour. The earnings of a weaver thus come to Rs. 30 to Rs. 40 per month.

Well-made salwood hand-loom last for about three generations. The price of a loom depends on the supply of wood and the wages of the carpenter; it accordingly varies from Rs. 25 to Rs. 40, depending on the construction and design of a loom.

The chief market for the products of hand-loom in Southern Bengal is the *hât* held every Tuesday in Ramkristopore near the Howrah Maidan. The weavers and the *mahajans* come from Midnapore, Bankura, Howrah, Hooghly, Nadia and the Jessore districts and on every *hât* day the cash transactions exceed a lakh of rupees. The major portion of the sale proceeds at the *hât* are used up in buying fresh yarns which are taken back to the villages by the weavers.

The *hât* held every Friday at Madhyakul in the Jessore district may also be mentioned in this connection. It is situated on the way from Jessore to Keshulpore and is about 18 miles from the former. This *hât* is chiefly controlled by the *mahajans* who obtain their requirements from the weavers in exchange for yarn and cash. They send the goods to the Ramkristopore *hât* for sale. This is the chief outlet for the products of hand-loom weavers in Jessore. The rest is taken by merchants from Faridpore, Backergunj and other neighbouring districts along the river routes.

Embroidery.

About 35 years ago a few enterprising Muhammadan merchants conceived the idea of introducing Indian embroidery into the American markets and were enterprising enough to open shops in New York. For a time the American patronage was good and as a result the industry received a considerable impetus in the Howrah and Hooghly districts. Muhammadan women accordingly took to the embroidery industry as a secondary occupation, and the merchants grew in wealth. But the merchants being uneducated, they could not adapt themselves to the requirements of the American market and gradually the demand for Indian embroidery ebbed. The industry is not in a very prosperous condition at present.

The chicon work industry has been organised in Barasat and Halishar by Dutt Bros. of Chinsura who have a sales depôt at 39, Park Mansions, Park Street. They sent their products to the Panam Exhibition and have since been doing business with England, U. S. A. and Australia but chiefly with the latter country to the extent of Rs. 2,000 per month. Some 200 families are employed in this industry under the supervision of the said firm. Most of the workers are Muhammadan men and women. In each village a sardar distributes the work and acts as the middleman between the dealers and the

workers. The wages paid depend on the workmanship. The cloth, which is to be ornamented, is supplied by the dealers along with the designs.

It may be observed here that the workers do not depend entirely on this industry. Their mainstay is agriculture and they *only* pursue their industry as a supplementary means of income. They only devote their leisure hours to it. Consequently the out-put is unreliable and this greatly hampers the export trade.

Tape and Newar Weaving.

During the war when there was a demand for newars and tapes, as the foreign supply was cut short, this industry was organised in some villages on the Howrah-Seakhala line. Tape weaving is done by *pardhanasin* Muhammadan women with a simple primitive loom which is very effective and costs about Rs. 3 only to construct.

During the war about 3,000 workers were employed in this industry.

Fishing nets.

Fishing is an important occupation of the Jessore district. The nets used are made by the fishermen. Yarn or twine used in the making of these nets is spun by means of a *takko*. The nets on being woven are immersed in a decoction of Gab fruit and oil to render them water-proof. In Trimohini and Pawahati (Jessore) these nets may be purchased on *hât* days.

Hosiery.

The hosiery industry for the manufacture of socks, stockings, jerseys, etc., seems to have been introduced in Bengal about 18 years ago by the firm of Messrs. J. C. De & Sons, who are said to have imported a few hand-knitting machines for sale for domestic use. These machines do not appear to have readily found favour at the outset; but during the Swadeshi movement, several hundreds of them were bought up and the industry seemed to prosper and was at its height during the war.

It is estimated that more than 100 vest-making machines and between 700 to 800 sock machines are now in operation throughout Bengal. Some factories have also been established in Calcutta driven by oil engines or electric motor, the chief of which are—

- (1) R. C. Shome's factory, 24, Jhamapuker Lane.
- (2) Economic Hosiery Mills, 50, Dhurumtolla Street.
- (3) Sealdah Hosiery Mills, 125, Bowbazar Street.
- (4) Simla Hosiery, 6, Ramtanu Bose Lane.

The difficulty of repairing the machines when out of order is a serious handicap and its spare parts and needles are also not easily available.

Both imported and Indian yarns are used in the manufacture of Indian hosiery goods. Most of the goods made in cottages and factories find their way to the Calcutta market. The chief difficulty which this industry has to face is the competition with Japan.

The Economic Hosiery Mills, Ltd., has for some time past opened a class for teaching the industry.

Tailoring.

Tailors' shops are to be found in every street in Calcutta, but this industry is particularly localised at Matiabrooz, which is situated in the south-west of Calcutta. The tailors, as a class, are entirely Muhammadans by religion. The bigger dress-makers' shops generally place out orders with outside tailors who call for them at intervals, generally, daily. If the making is on the basis of individual measurements, the rates are fixed according to the nature of the work, but in the majority of cases, clothing of standard sizes are made in bulk for which the prices are paid by piece-work. Occasionally, these tailors give out their work to sub-contractors, specially during busy seasons such as the Puja or in the winter. Ordinarily the Singer's machine is used; but hand sewing is insisted on in the making of the better classes of clothing. Plain needle work, dress-making and tailoring are taught at most of the girls' schools and convents on scientific lines. The children are sent up annually for the London City and Guilds Examination in these subjects. The Calcutta Commercial Institute, St Helen's Convent, Kurseong, and the Loretto Convent at Darjeeling deserve special mention in this connection.

Laundry Work, Dyeing and Cleaning.

Dyeing and cleaning.—Some 200 firms have established themselves in Calcutta and its suburbs for the redyeing and cleaning of fabrics, which ordinarily cannot be entrusted to the local dyers and dhobis, the latter of which are numerous and do a thriving business. The dyeing and cleaning firms experience a good deal of difficulty in securing the services of experienced workmen and in consequence, the redyeing of clothing is very indifferently done. In spite of this, these firms make quite a good living out of the industry. The best known of these firms are—

- (1) Bombay Dyeing & Cleaning Co.
- (2) Calcutta Dyeing & Cleaning Co.
- (3) French Dyeing & Cleaning Co.
- (4) Bengal Laundry.

Laundry.—Most of the washing of clothing is done by the local washermen or dhobis who, as a rule, hails from up-country. Some power-driven laundries have, however, been established in Calcutta. But for some unknown reason they do not seem to be in a prosperous condition.

Dyeing.—Practically no power-driven dyeing factory exists in Calcutta for the dyeing of yarns and piece-goods with the exception of those attached to the cotton-mills such as the Keshoram Cotton Mills, etc., and a few Marwari concerns which have been opened on a small scale in the vicinity of Howrah and Belgachia. There seems to be scope for the establishment of one or two power-driven dyeing factories installed with modern machinery. But so far capitalists are not disposed to venture their money in this industry although they are fully aware that there exists a fairly good demand for dyed yarns and piece-goods which are imported into Bengal from Europe, Japan, the Bombay and the Madras Presidencies.

Printing.

Hand-printing of textiles.—Of recent years, there has been a growing demand for cloths and (cotton and silk) *dhutis*, *saris* and handkerchiefs

printed by hand with blocks. This work is being done in Calcutta by up-country men who have come chiefly from Farrukhabad, Moradabad, and other places where the printing industry has been in existence for many years. This industry employs both men and women. The recipes of the printing liquors is kept a secret and the printers are not disposed to divulge them.

Ropes, Cordage and Twines.

There are nine small factories in Shalimar, Salkia, Ghoosery and Ultadingi for the manufacture of rope and cordage from coir, jute and hemp. It is customary to have a shed about 300 yards long where the twisting is done. The simple hand machines for hackling, spinning, balling and twisting are all locally made. The major portion of the production is made from Jubbulpore hemp, the proprietor of the Hunuman Rope Factory of Shalimar is the biggest merchant dealing in these goods. Other raw materials are used according to the needs of the customers. Occasionally women labour is employed. The ropes turned out in well-managed hand-power factories are said to satisfy all the requirements of the Marine Department.

Specially Treated Fabrics.

Dr. Nan of Kerbala Tank Lane, Calcutta, has for some time past been engaged in the manufacture of tracing cloth for which he commands a pretty good sale. It is understood that the Survey Department have approved of his tracing cloths and obtain them from him. Mr. S. M. Bose, who is a graduate of the California University, has also established a factory for the manufacture of "duckback" waterproof cloths and has received orders for them from some of the Government purchasing departments.

Several attempts have been made with varied success to produce tarpaulins on a small scale apart from those made in the power-driven factories which have been established at Calcutta during the war for the purpose.

Tanning.

The small tanneries of this division are concentrated in the neighbourhood of Calcutta, especially in its southern and south-eastern suburbs. They are found in six different centres, of which Tiljala with its 170 tanneries is the most important. The other centres are Mollahat in Tollygunge, Shapur, Durgapur, Gopalpur and Tangra. Altogether about 240 such tanneries are in existence and their daily average production amounts to 1,000 cowhides, 200 buffalo hides, 450 sheep skins and 100 calf skins. The total number of men engaged in the industry is about 1,500. The tanneries are generally located in thatched or tiled huts each containing about a dozen pits or tubs and a couple of unhairing and fleshing beams. The workers are mostly Muhammadans.

Where cowhides and calf skins are treated, green salted as well as dry hides are used. These hides are first soaked in water for a night, and then a lime paste is applied to them. After a day, they are put into lime pits. The one-pit system is generally followed, the liquor being

strengthened on alternate days by the addition of fresh lime. The treatment generally takes 8 days in the case of green hides and 12 for the salted and dry ones. They are then unhaired on the beams and are put into fresh lime pits for 2 days. The delimiting is done by soaking the hides in a solution of water and bran. Tanning is done by treading or handling the hides for a day or two in a pit containing a weak tan liquor. The liquor is gradually strengthened by the addition of further tan-stuffs. The ordinary decoction used for tanning 20 hides is 50 seers of Babul and 5 seers of Myrabolan. The hides are handled on alternate days. This process is continued for a week, then the hides are shaved. In the following treatment 1½ maunds of Goran, 1 maund of Babul and 10 seers of Myrabolan are used. Lighter hides are tanned in 3 months, but the heavier ones require 4 to 6 months' treatment. Sheep skins require much less time, the liming process takes about 4 days, and the tanning about ½ month and a half.

In the case of buffalo hides, the delimiting is done in a bath containing putrid fermentation products of hides fleshings and *akand* leaf. This process takes about 4 hours.

The tanning is done by what is known as the bag process. After treating the hides in tanning liquors of increasing strength for 9 days, they are sewn up in the form of a bag with the grain-side exposed. The bag is hung up and is filled with crushed bark into which water is poured from the top. The percolating water is collected and re-used. The tanning process is completed in about a week's time.

The better qualities of tanned cow hides are then coloured and finished for footwear or are kept in the natural form for the making of straps, suit-cases, portmanteaux, etc. The inferior qualities are made into rough patent leather. Finished sheep skins are used for the uppers and the linings of children's footwear. The bulk of tanned buffalo hides are used as sole leather. The lighter ones are finished for harness leather. The finishing is done on a table with stone sleekers and the hides are then lightly dubbined on both grain and flesh sides.

There are a few chrome tanneries owned by Chinese firms, where cow hides and sheep skins are cured on a small scale. The double bath process has been adopted, but no machinery or appliances are used. The leathers are unglazed and are sold at a cheap rate to Chinese shoe-makers at Calcutta.

Manufacture of Leather Goods.

In almost every part of Calcutta and its suburbs, except the regular business quarters, there are to be found shoe-makers. The most common things made of leather are slippers and ordinary shoes, but straps, belts, purses, handbags, suit-cases, portmanteaux, harness and saddlery, etc., have not been neglected. Some of the big *bustee* lands of Calcutta are inhabited by *moochis* whose sole occupation is the manufacture of slippers and other footwear. The most important of these colonies are the *bustees* of Machuabazar, Thantania, Rajabagan and Goabagan.

The Chinese of Bentinck Street do a regular business in the manufacture of cheap boots and shoes which are greatly appreciated by the average Indian public. These Chinese are a skilful and hardworking people who with a few ordinary tools and a Singer's sewing machine produce articles which have not as yet met any serious competition. The number of such *moochis* is about 1,000.

Hand-bags, suit-cases, etc., are chiefly made in Mollahat, Kidderpore, and other places situated near the tanneries. These goods are not only sold in the Municipal Market, but some of the large European firms at Calcutta purchase them. Harness-making is mainly confined to Lalbazar (on Bowbazar Street and on Lower Chitpore Road) and in Chandni (on Dhurumtola Street). Drums and other similar musical instruments (e.g., *khol*, *pakhaoz*, *bajatabla*, etc.) are made in large quantities at Chitpur Road, Goabagan, Cossipore, Baranagar and Sinthi. In Sarkar Lane there are 9 huts where blacksmiths' bellows are made.

Generally the leather goods made by the mufassal *moochis* are of very poor quality, but recently a number of them settling in the thanas of Uluberia, Amta and Bagnan have begun making shoes which compare favourably with the handmade varieties of Calcutta. Naturally the price is lower and the local *bhodralog* people have begun patronising them. Tanned leather is also taken from Calcutta.

Hardware.

The manufacture of hardware is carried on to some extent at Maniktola and Ultadanga where there are some 20 shops making iron safes and other goods from rejected iron as well as from new sheets. All the operations of shearing, drilling and rivetting are done by hand. There are about 200 people who are settlers from the United Provinces engaged in this industry. The safes when painted look quite well and there is a steady demand for them.

There are some 500 people engaged in the manufacture of steel trunks, cash and tin boxes.

Imported sheet metal and tin are used in making them. The manufacture of these trunks is all done by hand. The gradual development of this industry has given a set-back to the importation of foreign trunks.

Following the lead of Messrs. P. N. Dutt & Co., some blacksmiths have begun manufacturing buckets. But instead of doing it with steel sheets and then galvanising the finished bucket, they construct them with galvanised sheets. The resulting product is therefore of inferior quality, but there is no difficulty in marketing them. Bath tubs, tanks for unfiltered water, etc., are made in this way.

To meet the demands of the oil mills at Goabagan and Circular Road for containers, the canister-making industry has advanced considerably. There are some 20 shops in Halshibagan where this is done and the workers thus employed number about 400. All the work is done by hand. This industry has received a similar impetus in Salkia and Sahapur where oil mills also exist.

Cutlery such as knives, scissors, etc., and also surgical instruments are made by hand, but occasionally the grinding and polishing machines are driven by electric power.

The manufacture of iron shoes for bullocks and horses is practically carried on by all blacksmiths. Shoeing nails have been attempted, but machine-made nails imported from Sweden are preferred.

There are a very small number of factories in Narkeldanga and Maniktola which manufacture wire-nets on looms. The weaving is of various designs. The number of workers engaged in the industry is about 50.

About 1,100 people are engaged in different parts of the city of Calcutta and its suburbs in making locks, hinges, hat-pegs and other similar fittings in brass. The workmanship of these goods is rather crude, but the local demand for them is fairly large. During the war the lock-makers did a particularly good business, but it is doubtful how far they will be able to face the competition of the imported stamped sheet metal locks which sell in the market at about half the price of the indigenous articles. Thus, although the manufacture of locks is an important industry, the famous brass locks of Natagarh (24-Parganas) have suffered from foreign competition; but the cheap iron padlocks turned out in Domjar thana (Howrah) are said to find a ready sale. Round about Makardah there are about 150 families who depend on this business. Ordinary blacksmiths' tools are used and the finished goods are supplied to the Calcutta market.

Metal work.—The ordinary equipment of a village blacksmith are his hearth and bellows, anvil, chisels, a few pair of tongs and a few hammers, the whole being housed in a shed not more than 10 x 10 feet. The hearth is constructed on the floor. The bellows are either locally made or are imported from Calcutta.

Where cutlery is manufactured, the equipment consists of a water trough for tempering the blades, a vice, files, hand-drills, grinding stones and polishing wheels. The last two are made from a composition of sand or fine grit and lac and are usually about half an inch to one inch in thickness and 1 foot in diameter. The spindle is mounted horizontally and the disc is revolved either by means of a rope or a treadle wheel.

Without exception, the iron and steel used by the blacksmiths come from Calcutta, having been imported from the United Kingdom and Belgium. Recently Tata iron has been used.

Skilled cutlers earn from Re. 1 to Rs. 2-8 per diem. Ordinary blacksmiths also are found in almost all important villages. They make or repair plough-shares, *daos*, sickles and other iron utensils required for domestic or agricultural use. Amongst the more important places where cutlery is made for local needs, the names of Jessore and Kaligunge (Khulna) may be specially mentioned. *Daos*, scissors, nut-crackers, sacrificial knives, etc., are the chief products.

Die-sinking and engraving are other important local industries of Calcutta although carried on in a very modest way. The craftsman working with a few tools in a small room either alone or with one or two assistants generally escape attention; but it has been estimated that between 300 to 400 of them can be found in the different parts of the city. They secure orders from the large printing establishments and also undertake orders for elaborate metal engravings. The class of work done by these engravers is good and in some cases excellent.

Umbrella-making.

At Nebutola and Chorbagan in Calcutta some 10 umbrella manufacturing firms have come into existence. The fittings and the cloth are generally imported. The handles are made from Tulda bamboos obtained from Chittagong, Tippera and Sylhet. The part of the bamboo where it is to be bent is first filled with sand. The bending of the bamboos for the umbrella handles is done as follows: The hollow portion

which is to be bent is first filled with sand and U shaped iron corresponding to the size of the crook of the handle is heated in an open fire, and the bamboo after being fixed at one end of the iron is gradually bent over to take the necessary shape. The sand inside the bamboo prevents it from cracking without offering any resistance to its bending and is perhaps useful in distributing the heat evenly. When the required shape has been given to the bamboo, the iron is removed, the sand taken out and a piece of soft cane is inserted in the opening to fill it up. In order to retain the shape permanently, the bent part is tied with a string for a week or so. The subsequent processes are sand-papering, ornamenting the handle, by burning and polishing.

Repair Works, etc.

The repair of watches and clocks is another industry in Calcutta in which some 400 artisans are employed. Most of these workers have learnt the art by their being employed in some of the European watch-makers' establishments and have subsequently set up their own firms.

As regards other mechanical repair works it may be said that in almost every street of Calcutta repair shops equipped with a drilling machine, a lathe and a welding plant are found. These shops undertake the repair of electric fans, motor cars, sewing machines, cycles, stoves, etc., and earn quite a remunerative return although the competition is gradually becoming keener owing to the growth of the number of these shops. Most of the men who are thus employed at these workshops have been trained at some of the bigger establishments and earn from Rs. 35 to Rs. 80 per month. It is estimated that about 2,000 men are so employed. The machinery installed in these factories is either hand-driven or worked by electric motor.

Electro-plating.

Electro-plating is done in several workshops near the Municipal Market, orders for which are received from shops as well as from private customers. Most of the articles are silver-plated as the process is easier and is more appreciated than nickel plating. It is estimated that 1,500 men are employed in this particular industry.

Tinsmithy.

Tinsmiths are numerous in Calcutta. These men undertake orders chiefly for the soldering repairs of old utensils, etc., and also manufacture tin pots, canisters, lanterns, lamps, watering cans and many other similar articles. The average earnings of a tinsmith are about Rs. 30 to Rs. 50 per month.

Brassware.

The chief centre of the brassware industry in Calcutta is Kansaripara (Simla). There are 12 large and 28 smaller factories in which about 800 people work. The goods manufactured are usually for domestic use, namely, *deckchis*, *gamlas*, *handis*, *gharas*, *thalas*, *badnas*, etc. The raw

materials are imported brass and copper sheets. The shaping of the articles is done by hand. The articles are generally finished on a primitive lathe improvised for the purpose. No chucks are used but the articles are secured to the revolving spindle by means of a composition of lac and rosin. The vessels required for cooking are generally tinned inside. This is done by *kallywallas* whose sole occupation it is. All the implements required for the industry are locally made. The chief markets for these goods are Natun Bazar and Bara Bazar.

Brass and bell-metal work is to be found in Keshubpore (Jessore), Basirhat and Baduria (24-Parganas) and Kalyanpore (Howrah). Ordinary domestic utensils are made and the output is chiefly for local consumption.

Goldsmith and Jewellery.

Much of the accumulated wealth of Calcutta is locked up in the shape of precious ornaments and jewellery. There are several workshops in which gold and silver ornaments are manufactured, but a good deal of the work is done by goldsmiths who own shops in different parts of the City. Bullion is obtained from the gold market of Bara Bazar and the precious stones are procured from merchants, mostly Parsis and Marwaris who deal in them. The old and indigenous massive designs of ornaments have gradually given way to simpler and lighter patterns.

Gold and silver utensils, silver caskets, prize cups and other similar articles are made by goldsmiths residing in Kansaripara and Bhowanipore. There are about 30 establishments where these are made, and their workmanship and finish are well known. The appliances of a goldsmith's shop are generally primitive but a few of the bigger establishments have installed apparatus for wire-drawing and polishing.

The grinding of precious stones is done by a class of artisans who have acquired a fair amount of skill in it. The lustre of a cut-stone depends greatly on its geometrical shape. The setting of the stones in ornaments is done by goldsmiths. A worker's acumen and skill in this line of work develops by the scope of his practical experience in the art, and the secret which has been handed down to him by his forefathers.

Ivory Work.

The number of workers in ivory in Calcutta is small. They are scattered practically all over the city. The work done by these artisans chiefly consists of buttons, bangles, combs, and ornamental figures, which are carved out of the tusks of elephants, which they buy in the Calcutta market. No great skill in design and workmanship has so far been displayed by them. This is practically due to the competition of the large number of cheaply made ivory articles which find their way to the Calcutta market from the United Provinces, Madras, Burma, China and Japan.

Carpentry.

Nothing much can be said regarding carpentry and joinery which are properly connected with building, as the building trade is not a centralised industry. Carpenters are found all over Calcutta and when not

employed in building work they utilise their time in the making of packing cases and general repair work, etc. The more intelligent of these men also undertake furniture and cabinet making during slack periods. It is difficult to give an estimate of the correct number who actually take to this profession as they have no regular shops; but roughly speaking, they approximate 9,000 including the Chinese, the Punjabis, and other up-country carpenters.

Cabinet and furniture making.—Most of the professional cabinet-makers are located in Bowbazar and its neighbourhood, where some 7,000 workers do quite a lucrative business in the manufacture of cabinet and furniture on the contract system. The majority of these cabinet-makers have learnt their work at the factories of Messrs. C. Lazarus & Co., Pitambar Sarkar & Co., K. T. Hings & Bros., and other similar firms. The average earnings of these workmen vary from Rs. 20 to 80 per month.

Carriage-building.—Carriage building was up to a few years back almost entirely in the hands of European firms who did quite a brisk business in this class of work. But with the introduction of motor cars in Calcutta, most firms have now ceased to exist and the repairing work of this line of industry has passed into the hands of Indian firms who find difficulty in making ends meet. Lohaputty, Barabazar and Wellesley Street are the centres of this industry. The number of men thus employed may be estimated to be about 2,000.

Wood-carving.—There is little to be said regarding wood-carving. Beyond the carving which is done on furniture, on doors of Indian houses, etc., no elaborate work is resorted to in Calcutta.

Picture-framing.—Picture-framing is an industry which is carried on chiefly in Chitpore Road and Teritebazar in Calcutta; but a few firms have established themselves in the vicinity of the New Market and the other parts of the Indian quarters. The number of picture framers in Calcutta is said to be about 2,000.

Packing boxes and wooden casks.—The making of packing cases and the repairing of wooden casks are done chiefly by carpenters who have opened business in different parts of the city of Calcutta where there is a demand for these articles. The number of workers engaged in the manufacture of barrels and casks is not many. The packing-case industry is more important and the men engaged number about five to six thousand.

Chemical Industries.

Soap.—In the eastern suburbs of Calcutta, viz., in Beliaghata, Narkeldanga, Manicktola and Bagmari some 30 soap factories exist. Almost all the proprietors are Muhammadans and the capital varies from Rs. 500 to Rs. 10,000. Dhobi or Bangala soap is made out of cocoanut, groundnut, Mowa oil, animal fat and imported soda. The process is not scientific but by long experience the soap boilers have acquired skill in adjusting the proportions of raw materials. Soda silicate, kaolin, chalk and sometimes other injurious ingredients are freely used as fillers. The boiling is done in country-made pans and the soap is moulded into spherical and other shapes by means of earthen moulds, or where this is not done, the soap is simply sold in roughly hand-moulded cubes. Among the lower classes of people this soap is largely used as a toilet soap as well as for

washing purposes. Canning Street is the chief market and distributing centre for these soaps.

Perfumery.—Scents and hair oils are now being manufactured in Calcutta and are sold in the Indian markets. These are chiefly used by middle-class people. The best known of these firms are Messrs. H. Bose & Co., Messrs. S. P. Sen & Co., the Bengal Chemical & Pharmaceutical Works, Ltd. Several attempts have been made to imitate the imported articles but hitherto the results are not up to the mark.

Boot polish.—Various attempts were made during the war to manufacture boot polishes. But the results hitherto have not proved very satisfactory although the polishes are still sold in the market. The names of Standard Works and Nacco are the two best known firms in this line of manufacture.

Inks.—Attempts at ink-making have been also made by several firms both large and small. But the majority of the products are merely mixtures of the synthetic dyes.

Medicines.—The manufacture of drugs and kaviraji medicines is done by apprentices under the direct supervision of Kavirajes who conduct the business at their respective homes. But no factories have hitherto been established similar to the Dacca Sakti Ousadhalya where the work is done on factory lines.

Mineral waters.—The manufacture of aerated waters is mostly in the hands of Muhammadans who are as a rule illiterate and seldom pay sufficient heed to the filtration of water or to the proportion of the ingredients. There are in addition smaller factories which number about 20; other owned by Parsis and Europeans, which are run on more correct and scientific lines. The more important of these factories are those owned by Byron & Co., Scott Thomson & Co., Rose and Thistle, etc. About 1,000 hands are employed in this work.

Fire-works.

Fire-works are made by Muhammadans in several parts of the City of Calcutta such as Jorasanko, Rajabazar and Entally. Besides supplying the needs of the public during the Hindu festivals, these workers are largely patronised during marriage ceremonies, etc. The manufacture of fire-works is not conducted on scientific lines as the makers of fire-works are, as a rule, illiterate and know how to make only a few things such as crackers, squibs, fancy lights and matches.

Glass.

The glass blowers of Machuabazar near the junction of Chitpore Road and Harrison Road have been carrying on their business for a long time. Cheap ink-pots, kerosine oil lamps and phials are made out of glass fragments after remelting them in roughly constructed wood-fed furnaces. There are similar factories near College Street and Harrison Road junction. The workers are Muhammadans and are fairly skilled in their work. In addition to the usual blow pipe, they use a knife, a few strips of iron and one or two moulds. The recent venture in this line of work is the manufacture of shades for electric bulbs. These also are made from broken glass which is collected. Two men working for

a day can produce 3 dozen shades which are sold at about a rupee. Some of the big dealers of electrical goods purchase them as they are satisfactory.

The two small glass factories started at Ramrajatola near Howrah and at Dum Dum are established on a larger scale and may be classified under the category of a power-driven factory or mill as distinguished from those run on more modest lines or cottage work.

Printing.

With the help of a treadle machine and a few cases of types, it is possible to carry on this industry on cottage lines. In Calcutta there are to be found numerous such presses. Machines of German make have found favour at the printing firms which are generally well employed as the demand for job work in Calcutta is considerable. Calcutta not only meets its own demand, but orders from all over the province as well as from up-country are executed.

Miscellaneous Industries.

Quite a number of small firms and factories exist in Calcutta to supply the needs of the general public for photography, sign-board painting, wall-advertising, typing and painting. Roughly speaking the number of people thus-employed can be reckoned at about 2,000.

The Book-binding Industry.

There are in Calcutta some two hundred workshops each engaging about 10 to 30 hands in this line of business. These factories have installed hand-driven machinery for cutting, perforating, numbering, rounding and ruling. No machine is used for folding and sewing which processes are generally done by children. The labour employed is chiefly Muhammadan. The chief centre of this work is at Baitakkhana near Sealdah. But factories are to be found in most of the principal streets. The usual hours of work are from 7-30 A.M. to 11 A.M. and from 1 P.M. to 6 P.M. The workers who come chiefly from Dacca and Mymensingh, live at the factories and get their food at eating houses nearby. The wages earned by the skilled hand vary from Rs. 20 to 30 a month. These factories, owing to the pressure of work, work all through the year, with the exception of a short period during the Muhammadan festival. Apprentices are trained at these workshops and during the period of their training receive a nominal amount just sufficient to meet their expenditure. Boys from the age of 6 upwards are employed at these factories. In addition to the above factories, there are some larger concerns run by European capital at which a better class of work is done.

Making of Card-board Boxes and Envelopes.

Quite a good demand exists in Calcutta for card-board boxes, for packing shoes, soaps, hair oils, etc. Most of the factories dealing in such goods have been established on a large scale. The products of the factories are rather crude but they serve the purpose for which they are intended.

As regards envelope-making quite a good number of firms have been established in Calcutta to meet the demand of the local merchants. With the assistance of envelope-cutting machine, which is generally manufactured locally, large quantities of paper are duly made into envelopes. The making-up of the envelopes is done by child labour.

About 1,000 men are employed in the above industries in Calcutta.

Agricultural Industry.

In the villages the husking of paddy is done with the help of a very crude wooden lever which is placed horizontally and is supported by 2 upright posts placed in the ground on which pivots the horizontal lever rests. This lever is actuated by a woman pressing on the end nearest to the pivots with one of her feet—thus lifting the other end and allowing it to come down sharply on the paddy as soon as the pressure of foot is withdrawn. This machine is very effective and has found its way in every household.

To meet the requirements of the population of the larger towns rice-mills worked by power engine or electric motor have been installed and are practically worked on factory lines. The rice husking and polishing machines are those known as the Engleburge Hullers. The mechanism of these huskers is very sound and in consequence many attempts have been made to import similar machines in the country..

In Bengal some of the large rice-mills are—

- Annapurna Rice Mills, 86, Chetla Road, Tollygunj.
- Bharat Luxmi Rice Mills, 85, Chetla Road.
- Doorgapur Rice Mills, Alipur, 24-Parganas.
- Dulal Chand Addy Rice Mills, Alipore.

Flour milling.—The cottages in the rural areas grind their corn with the aid of two flat circular stones one of which is fixed in the ground while the other is made to revolve on it round a wooden pivot placed in the centre of the fixed stone by means of a wooden peg which is driven into the periphery of the moving stone. The two surfaces of the stones being thus in contact with each other and one of them made to revolve, the grain which is introduced between these 2 stones is naturally crushed or reduced to powder.

These simple hand-grinding machines meet the requirements of the villages, but where larger quantities are required flour mills have been established. Some of the smaller flour factories consist of one or more Stamford grinding mills which in principle are exactly similar to those used by the cottagers, but with the difference that they are worked by power. The larger mills have installed up-to-date plants on the roller principle for the reduction of the wheat into flour of varying grades.

The more important of these power-driven concerns are those owned by—

- (1) Bengal Flour Mills Co., 103, Clive Street.
- (2) Calcutta City Flour Mills Co., Ltd., 8, Clive Row.
- (3) Empire Flour Mills Co., Ltd., 103, Clive Street.
- (4) Hooghly Flour & Oil Mills, 41, Simla Road, Halsibagan.

Oil Mills.

In spite of the fact that there are more than a hundred big oil mills at work, bullock-driven oil *ghanis* still seem to exist and are to be found chiefly at Maniktola and round about in the locality. The oil of the wooden *ghanis* worked by bullock power readily finds a sale as the public seems to think that this oil is superior to that produced at the power-driven mills. Most of the oils produced at the *ghanis* is used in cooking and the oil-cakes produced by the *ghanis* find a ready market as fodder for cattle. A good number of oil cakes are also purchased by the power-driven mills to extract oil from them for commercial purposes and the residue is sold as manure.

Sugar-making.

No sugar is actually manufactured in Calcutta or anywhere in Bengal; but some merchants have established factories on cottage lines rather than on the lines of small factories for mixing sugars whereby they realise fairly good profits. Most of these factories are situated in Ghorabazar, Cossipore, etc. There are about a thousand hands employed in these factories.

Tobacco.

Indian tobaccos are generally prepared and put on the market in two forms, *viz.*, *hooka tobacco* and *bidi tobacco*. There are 4 shops in Fouzdari Balakhana which are noted for their excellent preparations of *hooka tobacco*. There are in addition to these several other shops which also prepare this tobacco, but have not acquired the same fame. There are more people interested in the manufacture of *bidi tobacco* than in that of *hooka tobacco*. This is due to the secret of the making of *hooka tobacco* being limited to only a few. Before the introduction of cheap Indian and imported cigarettes, the smoking of *bidi* was far more general. It was, however, revived during the Swedish movement of 1905 and received a fresh impetus during the Non-co-operation movement. It is estimated that in Calcutta and its neighbourhood there are some 130 factories each employing more or less 40 work hands. The labourers are chiefly destitute women, children and elderly men who make a living out of it and are paid on piece-work. The leaves for the making of the *bidis* are imported by some merchants in the Ezra Street from the stations lying between Jharsuguda and Nagpur on the Bengal-Nagpur Railway. It may be said that the industry is in a thriving condition and those who have acquired a habit of *bidi* smoking prefer it to cigars or cigarettes. The tobacco prepared in Nawabgunge in Barasat subdivision is well-known.

"Hookas."

Bagrihat in the thana Damjur (Howrah) is famous for its *hookas*. About 60 families residing in the villages of Bogri, Bannarpara, Khatora and Shankaridal are engaged in this industry. The kernel within the cocoanut shell is extracted by cutting it into pieces. It is then exposed to the sun to allow the kernel to shrink, after which it is extracted and

is sold to oil-pressers. The husk is then removed by pressing the coconut on a spike fixed on the ground. The surface of the shell is scraped by a specially bent knife and is then polished. In imparting the black colour to the *hooka* a decoction of a special fruit known as the gab is used, but the recipe is kept a trade secret. Local coconut shells being of a spherical shape can be turned only into *dubba hookas*; but for better qualities of pointed *hookas*, the coconuts have to be imported from Cochin, Ceylon and Singapore. A steady worker can turn out hundred of *dubbas* or 60 of better *hookas* in a day and the monthly income amounts to Rs. 20 to Rs. 25. About 100 men are employed in turning the tubes for *hookas* near Keshabpore in Jessore. The *hookas* of Bagri and the tubes of Keshabpore are exported to Calcutta, the chief market being Natun Bazar and Hookaputty.

Pottery.

Excluding from consideration the ordinary earthenware which is made in very many places by the village *kumars*, the cooking vessels of Patihal (Howrah) and the pots and jars of Shakrail (Howrah), Kally-gunge and Allaipore (Khulna) have earned a reputation beyond their immediate neighbourhood. Roofing tiles of better quality are produced in Jhapardah, Prasstha and Mauri in Dumjur thana (Howrah). Kulgadi near Uluberia produces earthen toys and models; but the work is far below the Krishnagar standard.

Confectionery.

Quite a good number of bakers' shops have come into existence in Calcutta during the last few years to supply the needs of the general public for bread, biscuits, cakes, lozenges. The products of these firms find a sale at the New Market and the eating-houses in the City. In addition to these factories there are larger concerns owned by European firms such as Peliti & Co., Firpo, the Great Eastern Hotel, etc. It is difficult to estimate the number of men employed at these bakeries as most of the labour is worked part-time.

The Date Sugar Industry.

This industry is carried on in several districts of Bengal but Khulna and Jessore are noted for their productions. Of these two districts Jessore manufactures sugar and Khulna *gur*. Mr. Momen, the Settlement Officer of Jessore, has recently made a careful computation of the date trees which are said to number over 5 millions.

A tree is ready for tapping in about 6 years and yields juice regularly for at least 25 years. The tapping season begins in winter from October to March. A few of the lower leaves of the terminal tuft of foliage are first cut to expose a bare surface about a foot square. This looks white at first but gradually turns brown. After a week a hollow V-shaped groove is cut into it, and the juice which oozes out is collected in a bamboo receptacle inserted at the angle of the V. Earthenware pots hung from the trees collect the dripping juice at night. The process of tapping requires experience and careless preparation of the tree may shorten its life and even kill it. A specially trained class of men called

seolis or *gachies* perform this operation. Mr. Annett estimated the average annual yield of juice per tree to be 170 lbs., although trees are known to yield as much as 480 lbs. per annum. The trees are dressed or cut every sixth day and the surfaces are scraped every day to enable the liquid or juice to flow readily. The first day's juice is called *jiran*, the second day's *dokat* and the third day's *tekat*. The yield of juice on the first day is the best. The earthen pots in which the juice is collected during night are smoked to clean them as soon as they are emptied.

The trees are dressed or cut to face east or west so as to get the full advantage of the sun's action on the exposed parts. The cuttings are done on alternate sides of the tree in a zigzag appearance. By thus counting the steps and adding six one can easily tell the age of the tree.

The boiling off of the juice is done immediately or on the following day otherwise fermentation sets in. The boiling off is generally done by the cultivator himself within the limits of his own plantation. The juice previous to boiling is strained through a cloth and is then poured into large boiling pans. In 3 or 4 hours it becomes a brown semi solid mass. It is then poured into earthenware pots and is allowed to settle down and cool. The *gur* thus obtained is a mixture of sugar crystals and molasses.

The manufacture of sugar from *gur* is done by other men, who buy the pots of *gur* from the cultivators and refine it into sugar. The manufacturing season extends from the middle of December to the middle of May.

Three varieties of sugar are manufactured, *dolo* or *akra*, *paka* or *sacchi* and *dobara*.

Dolo is a soft moist non-granular powdery sugar used very largely in the preparation of Indian sweetmeats. The pots of *gur* as received from the cultivators are broken and the *gur* is put into basket called *pete* to drain off its molasses and hold back the solid portions. Each basket generally contains a maund or two maunds of *gur*. The molasses are collected beneath the baskets in large pans called *nada*. After a week, water-weeds called *pataseola* (*Vallisneria spiralis*) are placed over the baskets the water from which trickles through the sugar and is said to have the property of refining it. After about eight days of this treatment clarified sugar about 4 inches thick is obtained which is then scraped off and a fresh quantity of water-weeds are again used and the process continued. It takes about a month to extract the crystal from one basket of *gur*. The sugar is spread on bamboo mats and is dried in the sun. The yield of *dolo* is about 15 seers per maund of *gur*.

In making *paka* or crystalline sugar from the boiled mother liquor, the molasses is allowed to drain off by placing it in slanting platforms. The mass is then put in gunny bags and pressed further. The sugar is dissolved in water and boiled in large open pans. After straining, the sugar is boiled a second time and is left to crystallise in flat basins. Water-weeds are then applied and the resulting crystalline sugar is *paka*.

Dobara is the most highly refined sugar and is obtained only from *dolo* or *akra* sugar. On a coke-fed underground furnace rather shallow iron pans are placed and filled with 5 maunds of *dolo* and some lime water. While heating, the mass is continually stirred and all foreign matter is removed. Milk water is gradually sprinkled over it till no more scum is formed. The sugar is completely dissolved in 3 or

4 hours. The fire is then put out and a bucketful of cold water is added. The hot liquid is strained through gunny cloth into a brass pan and again boiled, three or four spoonfuls of milk are added from time to time to the boiling liquid. When the liquid becomes sticky it is poured into shallow earthenware pans and crystallisation begins in 6 hours.

The industry is conducted on a rather large scale in several centres of the Jessore district notably on the banks of the rivers Kabatak, Nabaganga, Chitra and Bhairab. The names of Kotchandpore, Tahirpore or Tarpore, Chaugacha, Jhikargacha, Keshabpore, Kaliganj, Fultola and Fakirhat require special mention. In the first named place the annual production at present amounts to a lakh maunds of sugar. The reason for this concentration on river banks is ascribed to the stagnant condition of their courses which favour the growth of water-weeds. The most noted centre in the district of 24-Parganas, namely, Gobardanga, is similarly situated on the banks of the half-dried Jamuna.

The refineries are mainly owned by capitalists and the mahajans have not as yet gained any control over the industry. The sugar makers are on the whole well-to-do. The labourers are Buno coolies who are Santals by race and were imported originally by the indigo planters of this district. Muchis are sometimes found among the labourers.

The sugar in addition to its being marketed at Calcutta (and through it to all the consumers of Northern India) is also purchased by Barisal merchants and is distributed and sold throughout Eastern Bengal.

Several side industries are dependent on the date sugar manufacture. It gives employment to a large number of labourers, such as tree tappers, basket-makers, potters, etc.

It should be noted that besides the centres mentioned above where sugar is made on an organised scale the industry is carried on in cottages throughout the district. Just like the coir fibre in some of the Southern districts of the Madras Presidency, sugar is used as a barter in village *hâts*.

The failure of the attempts made to introduce up-to-date machinery into this industry sufficiently indicates that the local conditions of the industry should always be taken into account before considering its modernisation. The demand for ordinary refined *dobara* in this country is much greater than that for the crystallised sugar in consequence of which this indigenous industry still exists in spite of European competition. The industry, however, is gradually declining and its resuscitation at present depends on improved processes and appliances suitable for a cottage industry.

Sugar from palmyra palm.—The manufacture of sugar from the juice of the palmyra palms was attempted at Kalyanpore under thana Bagnan, district Howrah. The Company formed for this purpose failed to achieve any result, though the manufacture of *gur* by boiling the juice has gone on. The thanas of Shampore in Howrah and Diamond Harbour in 24-Parganas still carry on this industry. The pots before being tied up on the trees are lined inside, so that one important scientific process seems to have been adopted. The season for palmyra palm juice begins just when that for date palm ends, so it is possible for a central refining factory to draw its supply of *gur* from both the date and palmyra palms. The subject requires careful consideration and a reference has been made to it by Mr. Annett during his investigation.

The Sunderbans and its possibilities.—The Sunderbans extend over the three districts of the 24-Parganas, Khulna and Backergunj and comprise an area of nearly 175 miles in length by an average of 70 miles in width. There is a network of waterways, some large, some small, which are more or less channels for tidal currents. The estuaries, rivers and canals contain salt water and the vegetation is characteristic of the country. In the Khulna district there are about 2,300 square miles of reserved forests which are completely at the disposal of the State for the benefit of the public. In the 24-Parganas there are about 1,700 square miles of protected forests where the Government can—

- (1) reserve any class of trees,
- (2) close a portion of the area for not more than 20 years,
- (3) forbid and prevent the collection of produce and the reclamation of land,
- (4) subsequently cancel or change any such order or prohibition.

The forests cover the flat swampy islands arising out of the alluvial deposits. *Sundri* (*Heritiera littoralis*) is the most important wood obtaining in the forest and in consequence of which the Sunderbans have derived their name. The trees thrive best in the north and the central belts of the Khulna forest. They reach a height of 45 feet and the wood is chiefly used for boat building in 24-Parganas, Jessore, Backergunj, Noakhali and other districts. In constructing huts the wood is much valued as posts and rafters.

Pussur trees are chiefly found in the forests of eastern Khulna. These reach a height of about 50 feet and the white wood obtained from it is used in planks, handles of tools and spokes of wheel. The Jhinedah subdivision of the Jessore district is an important centre for cart-wheels. A crude variety of lubricating oil is pressed from the fruit of the *pussur* tree, which is sold in the big river ports of Khulna and Backergunj. *Keora* (*Sonneratia apetala*) too rises to a height of 50 feet and the hard brown wood is suitable for boxes and furniture and is extensively sold in Calcutta and at Jhalakati.

Goran (*Ceriops Roxburkhiana*) thrives best in the forests of 24-Parganas. It is about 15 feet high and has a red hard wood used for posts and firewood. The Calcutta Research Tannery has conducted a series of experiments on the tanning value of its bark. Calcutta consumes a large amount of it and Port Canning and Maniktola are big trade centres. Messrs. Hoare Miller & Co. have also carried on some experiments with *goran* and find it satisfactory.

Gewa (*Excoecaria agallocha*) is found throughout the districts. Its chief use is as a fuel and it is sold chiefly at Calcutta. This wood is suitable for match sticks and boxes and it has been suggested that Khulna and Port Canning would be suitable sites for establishing match factories.

The palm called *golpatta* (*Nipa fruticans*) is found every where in the forests. It finds a ready sale throughout the Khulna district. The tender leaves are sometimes used in making ropes and the fruit is eaten by the wood cutters who visit the forests. The palm leaves are greatly used as a thatching material as well as for *golpatta* umbrellas. The annual revenue of the forest department from *golpatta* alone amounts to a lakh and a half of rupees.

The reeds called *hogla* and *nal* (*karka*) are woven into mats and baskets by Muchis and Domes. Occasionally the mats are found to be

of large size and serve the purpose of carpets. The Uluberia thana of Howrah, Falta and Diamond Harbour thanas in the 24-Parganas and Itinda and Saistanagar in Bagerhat subdivision are important centres of the industry. Good *sitalpati* mats are made at Bagerhat. The villages under thana Dumuria in Khulna are also famous for these mats.

A plant known as *hintal* (*Phœnix paludosa*) has recently attracted some attention as Mr. C. T. Grenon of Calcutta obtained in 1918 a five years' lease from Government to enable him to find out its utility. It is reported that nothing important has come out of the experiments. Wood cutting is an important occupation of the villagers living on the northern boundary of the Sunderbans. During the cold weather some fifteen to twenty of them form a party and start out in large boats taking with them provision to last three or four months. After selecting a forest area they anchor their boat and fell the trees both for timber as well as for firewood. It is a busy time with them and they seldom take a holiday. When the cutting is over they either load the boat or bind the logs into a raft and float them down.

Among other forest products bees' wax and honey require special mention. The chief trade centres are Niamati and Diamond Harbour. Shells are collected from river banks and sea shores by Buna and Bagdi women and are burnt into lime in miniature kilns. For plastering purposes this lime is specially useful. Debhata in the Satkhira subdivision is another well-known centre of this industry.

The largest mart for Sunderban products is at Bardal and is called Saheb's *hât*. It is a steamer station on the Khulna-Satkhira line. The *hât* is held on Sundays.

Remarks of the Director of Industries on the survey of cottage industries by the Superintendent of Industries, Presidency Division, made during 1921.

The industrial conditions obtaining in this division are somewhat special owing to its metropolitan character. The Superintendent has made a comprehensive survey within the time and resources available; covering the complete division and in particular regard to the following industries:—

- (1) Textile and allied industries.
- (2) Tanning and leather industries.
- (3) Hardware in small workshops.
- (4) Brassware.
- (5) Carpentry.
- (6) Chemical industries.
- (7) Embroidery and chicon work.
- (8) Sugar industry.
- (9) Miscellaneous industries including glass, card-board box making, pottery, fishing net, tape weaving, *hooka* manufacture and the timber industry of the Sunderbans.

2. In regard to the tanning industry the work done at the Research Tannery has already attracted a growing influence; many of the small

tanners are in touch with its developments and applying the same under its supervision. The machine equipment of the Research Tannery is patronised by them with the object of improving the finish of their labours. Promising individuals are being encouraged to develop small machine-equipped tanneries on the lines indicated in the recently issued handbook.

3. The survey of the weaving industry by the Superintendent shows that in the districts such as Jessore and Khulna there is considerable room for improvement and the encouragement in the adoption of the fly-shuttle looms. The Peripatetic Weaving Instructor at Khulna is doing good work in this regard but further demonstrations on a wider scale will be given by the expert weaving and dyeing party as opportunity offers. Particularly encouraging results have recently been obtained at Karaya Bazar in the south-eastern outskirts of Calcutta. The use of the fly-shuttle loom for the weaving of woollen blankets has been demonstrated with great success and blankets of full width are now being woven by increased number of workers. Six looms have been provided by the Serampore Weaving Institute, the cost being met by one of the social service bodies in the city whose interests and sympathy have been secured.

4. The chicon and embroidery industry has already received the attention of the department with the co-operation of the Registrar of Co-operative Societies. An industrial co-operative society has been formed amongst the chicon workers at Madhamgram in the 24 Parganas. Other similar societies will be encouraged. The large trade which was done with the United States of America in previous years can only be revived provided some organisation is effected amongst the exporting private agencies who are largely responsible for the organisation of this work. Such trade can only be successfully undertaken in large quantities with a regular supply of goods of quality. No one agency is able to find the capital necessary for such large undertakings whereas an organisation amongst such agencies would enable large scale trade to be attempted. The position has already been represented to Government and will be followed up in due course.

5. The sugar industry in the Jessore and Khulna-area is one whose possibilities have been recognised by this department for some considerable time, proposals regarding which have already been submitted to Government. These proposals were made before the department was equipped with the services of the Industrial Chemist. This officer is now giving particular attention to this industry and more complete information is now available with the result that proposals of a more substantial nature will be submitted to Government.

6. Many other industries referred to offer frequent opportunities for advice and improvement in various particulars which receives the attention of this department. Beyond this the department is unable to give much effective help owing to its present limited financial resources and equipment.

D. B. MEEK,

Director of Industries, Bengal.

The 25th June 1924.

BURDWAN DIVISION.

Districts—Birbhum, Bankura, Burdwan, Murshidabad,
Hooghly and Midnapore.

Weaving of Silk and Tussar.

BIRBHUM DISTRICT.

Mulberry silk weaving.

Village Baswa, Bistupur.—The weaving of mulberry silk affords occupation to about 400 families of weavers in the Rampurhat subdivision of the district. Each family on an average has two looms. The principal cloths woven are *chadars*, long *saris* (used by up-country women), muca-turbans, and thans for coating and suitings. Figured *saris* for which Mirzapur, Baluchar and Khagra, of the Murshidabad district are famous, are scarcely ever made in these villages. The use of dye-stuffs is unknown and the finished fabrics are decidedly inferior to those made at Murshidabad.

The silk yarn from which the fabrics are made is chiefly obtained from the district of Maldah and occasionally from the neighbouring villages of Gaffail, Joypur, Dangapara and other places where the mulberry silk worm is reared and the spinning of waste silk is carried on.

Each weaver with the help of 3 assistants (women and children generally) can weave 8 to 10 cubits of silk cloth per day of 10 hours and he earns from Re. 1 to Rs. 1-8 as his wages. The average income of a weaver or more correctly of a weaver's family is Rs. 30 to 35 per mensem. The weavers are not as a rule hardworking. No opportunity of a holiday is allowed to pass by without a suspension of work.

The *mahajan* who lives near a central place where this industry is carried on, is generally well off. He supplies the weavers with raw material and collects the finished products, allowing the worker *bani* or a wage on each piece of work. The finished goods are sent to Calcutta, Delhi, Lahore and other places where the *mahajan* has connection with firms dealing in these goods. There are, however, a few weavers who work independently, and dispose of their goods at the nearest marts, or to the *beparies* who visit the localities occasionally. The reason of the reported decline of this industry seems to be the want of organisation amongst the weavers who in consequence of their poverty cannot stock their goods and send them to more favourable places for sale as the *mahajans* do.

Tussar weaving.

The weaving of Tussar is chiefly done at Tantipara, Karidda and Kalipur in the district of Birbhum. In the first named village there are about 500 families of weavers who are employed in the weaving of Tussar and occasionally cotton. In the villages of Karidda and

Kalipur there are approximately 400 looms of which about half the number is employed in weaving Tussar.

The Tussar weavers seem to be comparatively better off than the silk and cotton weavers, the average income of each weaver being Rs. 45 per mensem. The weaver is helped in his work by the women and children of his family, and they can weave a *sari* 9 cubits long, in one day.

The raw material is purchased from the markets of Dumka, Chai-bassa, Jamtara and other places. The village is regularly visited by *beparies* (hawkers) who bring Tussar cocoons for sale. The supply of Tussar cocoons is not however regular the reasons being that the Tussar silk worm is not reared in these cottages but cultivated and grown in the jungle by the Sonthals, who collect the cocoons in the proper season and bring them to the markets. The reeling and twisting of the silk is done exclusively by women.

The finished products, which are chiefly *saris*, *dhutis chadars* and cloths for suiting purposes, sometimes find a ready local market, since it is the practice of the orthodox Hindus to wear Tussar silk during their religious and matrimonial and other ceremonies. The local *mahajans* also purchase this silk cloth and export it to Calcutta and sometimes to foreign countries through European merchants.

Mr. Lambourne, the Collector of Birbhum, has been trying for sometime to introduce the weaving of suiting cloths more extensively amongst the weavers of Karidda and Kalipur. The local weavers are completely ignorant of the methods of bleaching and dyeing and this has been a great handicap to them. However, the Department of Industries has taken up the organisation of this industry and arrangements have been made to open a peripatetic school of weaving at Suri with the special object of giving instruction in the methods of dyeing along with other subjects.

BANKURA DISTRICT.

Village Vishnupur.—At this place silk weaving is carried on by about 1,000 families, each family on an average employing two looms. Each operator takes about four days to finish a piece of cloth, 10 cubits long with ornamental border. About 500 pieces of such cloth are produced every day in this town.

A piece of cloth of the above measurements sells for about Rs. 10. The cost of raw material, dye stuff, etc., is about Rs. 4. So each weaver earns about Rs. 1-8 daily. This of course includes the assistance rendered by the family members. *Dhutis, saris, chadars, napkins, ruca* (turbans) and *thans* are woven at Vishnupur. Dyed yarns (blue and red) are more generally in demand for which aniline dyes are used, he indigeneous dye stuffs being extinct now-a-days.

A greater portion of the finished goods are sent to Calcutta, Bombay and Madras by the middlemen (*mahajan*), who in most cases advance the money to the weavers for the purchase of raw material. They, however, sometimes find a ready market for their goods.

Silk thread is generally purchased at the rate of Rs. 24 per seer from the local dealers who obtain it from Maldah and Murshidabad. The processes of dyeing is carried on by the weavers themselves. It

consists in dissolving the dye stuff in cold or slightly warm water, and then steeping the yarns in it for a certain time. The yarn is then taken out, squeezed, dried and again steeped in the dye solution if necessary. These dye stuffs are sold in the local market.

Very little rearing or reeling of mulberry silk is done at this place although the weavers had to depend on the local rearers one time for their supplies of materials.

The looms used are of the throw-shuttle type and no fly-shuttle sleys are used for the weaving of silk-fabrics, as the weavers believe that fly-shuttle looms are unsuited to them since the texture being fine, the silk does not stand the additional strain of fly-shuttle weaving.

The weaving of Tussar is also carried on at Vishnupur though not as extensively as the weaving of mulberry silk.

The Tussar silk worm is generally grown in the districts of Manbhum, Singbhum, Dumka, Giridih, Bankura and at Kalna on the banks of the river. The seed is generally imported from the markets of Chaibassa, Jamtara, Narainpur, Giridih and Dumka. Another favoured centre is Mourbhanj in Orissa.

Dealers often visit Vishnupur and the neighbouring centres of weaving with their stock of cocoons and the weavers generally obtain their supplies from them, the current price being Rs. 9 to Rs. 11 per *kahan* (or 1,280 cocoons).

The yarn is reeled in the following way from the cocoons:—

The cocoons are tied in a piece of cloth and then hung over boiling water until they are dead. They are then dried and boiled in a vessel containing water, cattle urine and *saji* water (or soda) for about an hour. They are then taken out and the floss removed. The cocoons are then ready for reeling. Reeling is done by running off one or two of the strands of silk on to a swift revolved by hand and imparting to it a little twist to bind them together.

BURDWAN DISTRICT.

Village Memari.—There are altogether six looms in this village employed in the weaving of silk at present, though it is said that formerly the industry was carried on here on a large scale and was in a very prosperous condition. The industry is here in a dying condition and the few who are still engaged in it are thinking of taking to cotton weaving which has become a more paying one. The silk yarn is supplied by the *mahajan* to the weavers who take back the finished products, weight for weight, without allowing for the decrease in weight during the process of bleaching. The weaver is allowed a *bani* or wage on the finished products.

Long *saris* and *dhutis* are the ordinary fabrics woven. These are generally exported to Madras by the middlemen. The average earning for the best weaver in the village amounts to about Rs. 20 to Rs. 25 per month.

Village Radhakantapur.—This is a village about six miles from Memari and was at one time famous for silk weaving. I found about 15 looms in operation and the weavers do not seem to be in any way

better off financially than the weavers of Memari. Similar conditions prevail here and the industry in a hopeless condition.

Villages Sripur and Khya.—There are about a dozen weavers in these two villages, employed in the weaving of Tussar. The common products are Tussar *saris* and *dhutis* which generally find a local market. The weavers find the industry to be a paying one.

MIDNAPORE DISTRICT.

Village Anandpur (Police-station Keshpur).—This village which is about 16 miles from Midnapore, abounds in a large number of Tussar weavers. There are about 400 families of weavers of whom about 300 are engaged in weaving Tussar and the rest in weaving cotton. Each family has two looms and employs two weavers on an average. The looms are, generally speaking, antiquated but a few of the cotton weavers use fly-shuttles. Tussar *saris*, *dhutis* and *chadars* are the usual varieties. The texture is common place.

Each weaver of Tussar takes about 4 days to finish a length of *sari* of 9 cubits—the time spent over the preliminary operation being also counted. This brings in a wage of Rs. 3 to Rs. 4 and it is calculated that each weaver can earn about Rs. 25 per month.

Some of the weavers take money and yarn in advance from the local *mahajans*, whereas others work independently. *Beparies* from Ghatal and Howrah, often visit the village and purchase the finished goods. Local *mahajans* also do a great deal of business.

MURSHIDABAD DISTRICT.

Village Khagra.—Both silk and *mutka* are woven in Khagra, the principal fabrics being *saris* with borders (often striped and checked) *chadars*, gown pieces, *dhutis* and *thans* for suiting; the latter cloth is generally exported. *Mutka saris* and *dhutis* are generally coarse and the mixed variety (of *mutka* and *khamru*) is very suitable for men's suits.

Naksha or fancy weaving is rather rare, and is only done on requisition. Govinda Raza is reputed for his skill amongst the *naksha* weavers. The silk (*khamru*) used is generally local, though Maldah silk is now and then imported.

There are about 40 families of weavers in Khagra and Berhampore, each family employing two weavers on an average. There are thus 80 looms, but some of these are partly engaged in weaving cotton. Most of the weavers get money or yarns in advance from their silk merchants and *mahajans* such as Messrs. D. S. Bhattacharjee & Co., S. S. Bagchi & Co., and others who live at Khagra bazar, and prepare fabrics according to their requirements. The weavers get a wage on each piece. Sometimes, however, the weavers work independently of *mahajans*, and dispose of their goods to merchants, shopkeepers or *mahajans* wherever they can command a good price. Some of the Berhampore and Khagra merchants have business connection with Madras, Bombay and Calcutta firms and through them with foreign countries also.

The average weaver can weave about 1 yard of *dhuti* or *sari* cloth in a day (of 8 hours) with the help of their family members. This brings in a wage of Re. 1 to Rs. 1-8 or sometimes more per day.

In connection with the silk weaving industry which is undoubtedly in its decline, I beg to make the following observations, which I hope will explain to a certain extent the difficulties and requirements of the present situation:—

(1) *Unsatisfactory reeling.*—The workers have no idea of the necessity of using the proper *danier* of silk for making the different kinds of fabrics, as is the case in the West. The workers do not seem to understand that the texture of their cloth depends on the proper standard and uniformity of thread nor do the reelers have any idea about the number of cocoons required which should be used to give a yarn of a particular count.

(2) *Ignorance of the use of dye stuff and bad finishing.*—The silk weavers of most places and specially in Birbhum scarcely have any knowledge of the use of any dye stuffs and their methods of bleaching are also unsatisfactory.

(3) *Inefficient appliances.*—Throw-shuttle looms are exclusively used for silk weaving as the weavers think that improved looms are unsuited for the purpose of silk and Tussar weaving and it cannot be done.

(4) *Exploitation by capitalists.*—The weavers are practically enslaved to the *mahajans*. The ideas of co-operative work and general co-operation is foreign to them.

(5) *Want of education amongst the weavers.*—Almost all the weavers are illiterate and their ignorance is proverbial in Bengal. They do not appreciate their own interest and view any activity calculated to help them with suspicion and incredulity. They are devoid of any sense of responsibility and cannot be relied on to execute an order in proper time.

It is proposed to establish a Government silk weaving school at Berhampore equipped with modern machinery. It is calculated that this school will do an immense amount of good to the whole industry, by bringing home to the workers the defects of their existing methods of work and teaching them the use of improved machinery. A series of demonstrations in silk weaving on fly-shuttle looms and other appliances given in the important centres of the industry, will help very considerably in uplifting the workers and ameliorating their present conditions.

Weaving of Cotton.

BIRBHUM DISTRICT.

Village Dubrajpur.—There are about 125 hand looms engaged in the weaving of cotton in Dubrajpur. These hand looms are mostly of the primitive type, only about 25 per cent. being fly-shuttle looms. The textures woven are generally coarse (of counts No. 10, 12 and 16 only). Each weaver with the help of his wife and children earns Re. 1 daily. The produces find a ready market on the spot, and the yarn is supplied by a local dealer, namely, Messrs. Dhansukdas Hiralal

& Co. No weaving of Tussar and silk is done here and the weavers, as a whole, are not prosperous.

Village Sian.—This village, which is about 5 miles away from Bolpur, contains 15 families of weavers, each family on an average employs two weavers. Fly-shuttle looms are used and the fabrics woven are of cotton. The yarn is supplied by the *mahajan* who also takes over the finished products. The difficulty in obtaining the regular supply of yarn has prevented the weavers from independently carrying on their business.

Village Tantipara.—About 150 looms in this village are engaged in weaving cotton and about 350 more are on weaving Tussar. Cotton weaving is indulged in only by the less prosperous of the weavers, *i.e.*, by those who cannot afford to weave Tussar due to limited funds. However, some of the Tussar weavers also weave cotton when the Tussar market is dull. Of the 150 looms at this village only about 10 per cent. are of the fly-shuttle type the rest being throw-shuttle looms. On an average the cotton weaver earns from Rs. 25 to Rs. 30 per month.

BURDWAN DISTRICT.

Village Boktarnagar, Raniganj.—There are about two dozen Tanti families in this village, and 50 fly-shuttle looms. These looms are all engaged in producing coarse fabrics (Nos. 16, 20 and 10 counts being used). Each machine produces about 10 yards of cloth a day (12 hours). And the cost of manufacture of these 10 yards of cloth (inclusive of the labour) is about Rs. 2.

Finer cloths (of No. 40 and 60 thread) which are generally worn by the middle classes are not produced by these weavers. They say they can easily produce those cloths but since they absorb more labour they are not paying. Besides, there is a ready market for the coarse cloths. If, however, there is sufficient inducement and a better market the weavers are ready to take to the weaving of finer fabrics.

The fly-shuttle looms are manufactured by village carpenters and they work quite well. The cost is about Rs. 40 for the whole machine complete with accessories, and they last for about ten years with occasional repairs. The average annual cost of repairs is about Rs. 3 or Rs. 4.

Village Kenna.—There are about 25 *jollahs* in this village who weave coarse cotton fabrics such as *gamchas* and *lungis* with fly-shuttle looms. The yarn is supplied by a *mahajan* of village Dashpur in the Hooghly district and the fabrics are made according to his requirements. The weavers get a wage only. The average earning of a *jollah* family amounts to about Rs. 20 per month.

Village Ichapur.—There are about 30 *jollahs* in this village who generally weave coarse fabrics but can turn out finer fabrics if required. Their condition is almost similar to that of their brethren at Kenna.

BANKURA DISTRICT.

Bankura Industrial Union.—There are about 500 weavers belonging to this Union, who are supplied with yarns from the stores of the Union

and return the finished goods, receiving a certain wages on each piece of the produce. In addition, the weavers are entitled to a certain per cent. of the profit. An average weaver earns Rs. 12 to Rs. 15 monthly. The finished products are generally napkins, bedsheets, *dhutis*, *saris*, cloths for shirts, suitings, etc. Last year the Company gave 12 per cent. dividend.

Patrasayar.—There are about 250 weavers and an equal number of looms in Patrasayar and the neighbouring village, all these weavers are engaged in weaving *dhutis*, *saris*, *gamchas*, etc. Counts 10, 12, 20, 32, 40 and 60 are generally used.

The condition of the weavers is not prosperous owing chiefly to their own indolence. The exploitation by *mahajans* has also contributed towards this. Each weaver takes about 2 days and a half to finish a pair of *dhutis* 10 yards by 44 inches, which brings him a remuneration of Rs. 2 according to the present rates. The average weaver therefore earns about Rs. 20 per mensem. Yarn is generally supplied by local *mahajans*, who also take the finished products, allowing the weaver a *bani*. Fly-shuttle looms have been introduced to a great extent in this locality.

HOOGHLY DISTRICT.

Serampore.—There are about 200 weaver families and an equal number of looms at Serampore. The fabrics made in this place have a special reputation and pass in the market as "Farasdanga" *dhutis*. *Dhutis*, *saris*, *gamchas* and *chadars* are the products of the looms and the counts used are 32, 40, 60, 70, 80, 90 and 100.

The industry is in rather a flourishing condition at Serampore and the same may be attributed to a great extent to the wholesale introduction of fly-shuttle looms and simple warping machines, with the help of which a full width or half a width of warp can be reeled off at once.

Of the 200 families only as many as 25 work independently, purchasing their own yarn from Calcutta and disposing of the products in Ramkristopore *hat* (Howrah) and other markets. The rest are under the *mahajans* and work on the *bani* system. The average earning of a weaver of this class is about Rs. 35 per mensem.

Other centres of weaving in the neighbourhood are Begumpur, Kharsarai, Haripal, Kaikala, Dhaniakhali, Gopinathpur, Atghara, Naskaipur, Parialpur, Jajpur, Banigachi, Kumir Morah, Antpur, Rajballavhat, Noagachi, Chandhat, Rashidpur, Ranibazar, Ramnagar, Santoshpur and also French Chandernagore.

I have the following general observation to make regarding the condition of the cotton weaving industry in this circle:—

The introduction of fly-shuttle looms has not taken place to any remarkable degree, more specially in areas where the weaving of silk and Tussar is done. One of the reasons is that in silk and Tussar weaving centres, there are weavers who work on silk and Tussar when the market is favourable, but resort to cotton when the market is dull. These people always prefer to use their throw-shuttle looms, since the fly-shuttle, according to them, cannot be used for the weaving of silk and Tussar. Those, however, who are engaged in the weaving of the coarser fabrics have adopted fly-shuttle looms and use no other.

Saris, dhutis, napkins and chadars, are regularly woven and they find a ready market, whereas the weaving of the finer cloths, according to these weavers, does not pay since they take up more time and it is difficult for them to compete with mill goods of equal fineness. Bed-sheets, suitings, shirtings and some other domestic cloths are made at Bolpur, Dubrajpur, Kridda, Alunda and Bankura. Yarn is supplied to the weavers by local merchants who also purchase the material when woven. Each weaver with the help of his wife and children earns about Re. 1 per day.

Weaving of Woollen Blankets.

BURDWAN DISTRICT.

Village Asansol.—This industry is carried on at Asansol by a class of people called *bhedivalas* who are considered low caste up-country Hindu. There are about a dozen families here who carry on this industry, each family engaging on the average about two male persons in weaving the blankets and two women in spinning and in preparing the wool for the purpose. A male person takes about three days to finish a blanket measuring (7½ feet by 4½ feet) with the assistance of a woman. The cost of such a blanket is about Rs. 7 and the cost of the raw material is about Rs. 2.

Most of the *bhedivalas* possess a great number of sheep from which the supply of the raw material for weaving the blankets is obtained. The wool can also be purchased in the market at about Rs. 40 per maund. The spinning of the wool is done as follows: The wool is washed and dried in the sun. It is then made soft and loose with the help of a bow-string to spin up the fibres and to enable it to be spun more readily. The spinning of the wool is done exclusively by women. A *charka* of a very primitive type is employed but it seems to answer quite well. The weaving of the blankets is also done on hand looms of a very primitive design.

The introduction of fly-shuttle, looms would be a great help in improving this industry.

Embroidery Work.

MURSHIDABAD DISTRICT.

Berhampore.—The embroidery of weaving apparel with silk and cotton thread has almost died out. There are only two or three people left at Murshidabad who know Phulbati, Zardosi and Kamdani work and still carry it on. At one time, it is said this industry afforded a livelihood to more than 100 families in the city of Berhampore. The Muhammadan aristocracy and the more well-to-do citizens of this town always had their costumes embroidered with silk thread. The ornamentations used were mainly composed of flowers, fruits, birds and other conventional designs. The ornamentation of a chapkan with an intricate design took one workman from 8 to 10 months to finish and the wages he earned amounted to as much as Rs. 150 or Rs. 200 for such a piece of work.

Munshi Anayet Hossain and Zaffar Hossain, Khodi Sheik, Ahamed, who earned name and fame in this art still indulge in it during their spare time. Most of the other families who carried on this work for generations have now given it up.

Some ladies of Muhammadan households even up till now indulge in this art in their spare time. They, of course, do not work for remuneration, but take pride in having all the clothing of their family members embroidered as far as possible.

Sujni Work.—This industry is carried on at Berhampore by the women folk during their leisure time. The designs which are composed of flowers, fruits and bird formation are worked on white nainsook or mulmul with coloured thread and a needle. These are used as bed-sheets but are scarcely to be found in the markets for sale.

Manufacture of Brass and Bell-metal Wares.

MIDNAPORE DISTRICT.

Village Kharar.—Of all the places where this industry is carried on, Kharar is the only place where there is a proper organisation for efficiently doing so. There are about 100 *mahajans* in this village, every one having a workshop of his own. Some of these shops employ as many as 70 to 80 workmen. There is a division of labour and the daily earnings of a workman varies from annas 6 to Rs. 1-8 per diem according to the nature and skill of work done. The man working at the forge earns the highest amount while those engaged in cleaning and polishing earn the lowest.

Bell-metal *thalis* are the speciality of this place, but the finish and workmanship of them are not of a very high class. The raw material, *viz.*, copper, tin and also zinc are purchased from Calcutta and sometimes from the Strait Settlements and Japan at wholesale rates. The alloy is prepared in the factory. Sometimes broken bell-metal utensils are collected in huge quantities from the mufassal which are then melted down and are used over again as starting material. All the processes which may be classified as (1) smelting, (2) forging, (3) hammering out, (4) beating out in the cold, (5) scraping, (6) spinning, and (7) polishing are done by hand with the help of crude appliances. Almost all the products are exported to Calcutta, and the quantity exported, is said to exceed fifty thousand maunds in weight per annum from the village of Kharar alone. The neighbouring villages where this industry is also carried on to any great extent are Udaiganj, Kristopur and Raidanga.

Though one is satisfied with the mode of organisation, distribution of labour and other systematic ways in which the industry is carried on in this place yet one cannot but sympathise with the hard lot of the workers in this place. They are worse off than the average workers of Vishnupur or Khagra. The *mahajans* are very rich and have these poor unfortunates absolutely in their clutches.

Patnabazar.—There are about 25 families at this village each engaging two men on an average, to assist them in the manufacture of brass-wares.

The industry is carried on a poor scale and the only items are brass *lotas*, *garus*, and cups. Moulds are prepared by the workers themselves

from local earth and each family and workshop can turn out at the utmost five to six seers of finished material per day if the moulds have been prepared and are ready for use. The workers earn a wage of annas twelve to annas fourteen on each working day.

The workmanship and finish of the goods is not good. Raw materials in the form of broken wares is supplied by local *mahajans* and they take the finished goods allowing a wage or *bani* on the weight of the finished products.

The workers are badly off in circumstances and many who originally were engaged in this industry have taken to other pursuits such as gold and silver smithy.

MURSHIDABAD DISTRICT.

Village Khagra.—The bell-metal wares of Khagra have earned a great reputation for themselves. The high skill and workmanship are the valuable assets of the artisans of this place.

There are about 50 small workshops throughout Khagra and Berhampore, each employing 8 men on an average. The headman is a skilled artisan and is often the owner of the factory. He generally works at the forge. The workmen get a *bani* (or wage) according to the quantity of the metal each (or a group together) works up during the day, consideration being given at the same time to the nature of the work. The average earnings of a workman amount to about Rs. 22 per mensem.

The headman, who is directly in touch and responsible to the *mahajans*, earns much more. He is allowed a wage at the rate of Rs. 4 to Rs. 5 per seer on the weight of the finished products and is responsible for return, of an equal quantity of finished metal, weight for weight, of the raw material supplied by the *mahajan*, no consideration being made for the wastage of material during the operations. Raw material is supplied in the form of broken and worn out wares collected from the mufassal.

The workers of this place, particularly the headmen, seem to be much better off than their brethren at Vishnupur, Bankura, Kharar and other important centres of the industry in the Burdwan Division. The reason being that the *mahajans* have a lesser hold on the workers and in consequence the workers are also less indebted to the *mahajans*.

Highly finished *thalis*, tumblers and cups are the specialities. Tea cups, ash trays, flour vases and many other ornamental wares have found introduction and are often to be seen in the Khagra shops.

Bell-metal is composed of 2 parts copper and 2 parts tin and so also brass, copper and zinc in varying proportions). In this district the alloys are generally imported from Calcutta. Broken and worn out wares are also collected from the mufassal and often used as the starting material. Brass jars, *lotas*, *garus*, etc., are manufactured by smelting the metal and casting it in earthen moulds, which are prepared by the women folk generally. Each mould is used once only. As regards the bell-metal wares, such as *thalis*, *recub* and cups, etc., they are always beaten out into the requisite shapes by alternately heating the metal in a forge and then hammering it out on an anvil.

The wares are then scraped, chiselled and polished with the help of a lathe and a polishing oil.

BANKURA DISTRICT.

Vishnupur.—About 200 families, each employing three persons on an average, live by this industry at Vishnupur. The wares manufactured here are preferred for their superior polish and make and get a ready market at Chota Nagpur, Behar and other up-country places.

The brass and gun-metal workers of this place are absolutely enslaved to capitalists, who supply them with raw material and take the finished goods from them allowing them a certain wage (called *bani* locally) on each article. They are kept in such ignorance that some of them do not even know the current prices of the goods they make.

Cast bell-metal is often manufactured from its constituents (7 parts copper and 2 parts tin) by the workmen in their shops and sometimes the alloy is purchased from Calcutta. The alloy is then melted in an ordinary furnace with the help of bellows and it is cast into moulds which are usually prepared by the women folk of the household with the local clay. Each mould is used once only.

After the castings are made they are chiselled, scraped and then polished and sent to the market for sale.

Brass and Bharan are also manufactured locally by using the following alloys: copper, zinc and lead. It is similarly moulded, scraped and polished. The ordinary varieties of manufacture are dishes, cups, jars and other utensils generally used by Indians.

German silver.—Wares of German silver are also manufactured in this place. The raw material (German silver) often comes from Calcutta, but it is sometimes prepared by melting cupro-nickel alloy with zinc (55:45).

Bankura town.—The condition of the industry in this place is the same as that prevailing in Vishnupur except that the workmen are not so skilled as the Vishnupur metal workers. There are about 50 workers in the town.

BIRBHUM DISTRICT.

Village Nalhati.—There are about a dozen families and double the number of actual workers in this place. The wares of this place have more than a local repute on account of their high class finish. The reasons seems to be the proximity of the place to Khagra, where the best bell-metal workers of Bengal are to be found. Raw material is supplied by the *mahajan* and the work is carried on by these families on the *bani* system. The finished goods are taken by the *mahajans* and exported to Sahebganj and Calcutta. The average income of a worker is about Rs. 20. The *mahajans* are well off.

Village Dubrajpur.—Brass and bell-metal article of Dubrajpur are comparatively good enough though not so well finished as those of Khagra or Vishnupur. There are about 30 families of such workers each engaging on the average 2 men. Almost all castes, *viz.*, Kamar, Hari, Vaishnub have taken to the industry. The *mahajan* here also plays an important part in supplying the raw material, etc.

They take the finished produces to such markets as Calcutta, Asansol, Raniganj, etc., and dispose of the same. The condition of the workers is not at all satisfactory, a good worker earning Rs. 15 to Rs. 20 per month; whereas the *mahajans* seem to be well-off. Gour Kabiraj, Kasi Kabiraj and Phulchand Kabiraj are several amongst the prosperous *mahajans*.

BANKURA DISTRICT.

Patrasayar.—About 200 braziers work in this place. The articles regularly made are cups, glasses, and *lotas* mostly of brass. These are manufactured by casting the molten alloy in moulds prepared of local earth. The methods of turning and finishing are similar to those employed at Vishnupur and other places.

The industry is entirely in the hands of local *mahajans* who purchase the raw material from Calcutta and send the finished goods to Bankura, Chota Nagpur and Calcutta for disposal. The workmen assemble in shops maintained by the master artisan who in turn is directly in touch with the *mahajans* and he makes the wares according to the requirements of the *mahajans*. The daily wages of these workmen vary from annas six to annas twelve according to the nature of the work.

BIRBHUM DISTRICT.

Lakshmipur.—A kind of rice measure called a *pais* is made in this place by only one man. These are really wooden bowls, bound and ornamented with brass work. These *pais* are very popular owing to their excellent finish and appearance. Europeans purchase them whenever obtainable as curio. They are made to order only.

In the improvements of the industry I would suggest the following :—

- (1) Improved methods of casting.
- (2) Improved methods of beating out the metal.
- (3) Turning and polishing the brass and gun-metal articles.
- (4) The introduction of new design.
- (5) The establishment of co-operative societies.

The industry is at present carried on in a most primitive way and the instruments of manufacture and the methods of work are in consequence very crude and inefficient.

(1) As regards the first point I would suggest that since most of the articles manufactured are of similar design and size, box moulding would be an advantage.

(2) The beating out of the metal is done by heating it to a red heat and hammering it out with sledge hammers into sheet form. This is a costly operation and it is difficult to secure efficient labour. A spring hammer driven by power would very considerably assist in removing the present difficulties.

(3) The turning and the spinning of the utensils is also a rather costly operation in as much as after the articles have been cast or beaten out they are scraped with hand scraper after which they are attached

with a composition consisting of lac to the mandrill of a primitively designed head stock. This mandrill is revolved manually by throwing a string round it and pulling the ends of the string alternately, thus giving a reciprocating motion to it in consequence of which time is lost as the object to be turned can only be operated on in one direction. A small lathe driven either by an oil engine or by paddle would be suitable for this purpose and would ensure more accurate work.

(4) With regard to the introduction of new designs, the brass and bell-metal industry is practically limited to the manufacture of cooking utensils. These workers have had to depend for the sale of their brass and gun-metal utensils on the markets of this province only and have had hitherto done pretty well for themselves but recently aluminium ware is however being more largely introduced in consequence of which there is not quite the same demand for their wares and unless the *mahajans*, who practically control this industry, decide to improve their present methods of work they will find that in a very short time they will have very little demand for their goods. They should endeavour not only to cheapen the cost of manufacture of the utensils but they should try to secure markets for their wares in other provinces, and also to undertake orders for ornamental vases, flower pots, etc.

(5) The establishment of co-operative societies for the joint purchase of their raw material and the disposal of their finished products would be very beneficial to them.

Preparation of Leather and manufacture of Boots and Shoes.

BIRBHUM DISTRICT.

Tantipara and Suri.—There are about 100 Charmakars in Tantipara and an equal number in the Suri town, who prepare excellent boats and shoes to order. Most of the footwear finds a ready local sale although a portion of it goes to Calcutta merchants for disposal. The greater portion of the leather is imported from Calcutta. The Charmakars also tan some of their leather according to local methods for the manufacture of slippers, etc., required by the cultivators and other low class people. A brief description of the native processes of tanning may be interesting.

A hide of, say, about 6 seers weight is kept dipped in a small reservoir of water in which 2 seers of lime has been added. The hides are from time to time taken out of the solution, exposed to the air and the fleshy parts removed wherever possible. This process continues for a week. At the end of this period the hide is again removed from the solution, washed, the hair and the adhering flesh scraped off. A new solution or rather a mixture of about 1 seer and half of powdered Dhepat or Amlapat is now made in water. The hide is then dipped in this solution for about 3 or 4 days. After this the hide is dried and thought fit for the purposes of making soles for shoes and boots, etc. If the leather requires to be dyed and finished the hide is sewn up in the form of a bag within which is put in a mixture of Temasi (or Babul, Arjun bark, etc.) in water. The hide in this condition is hung from the bough of a tree for about a week or so. It is now thought to be finished leather.

Recently attempts have been made to form an association of *moochis* and to teach them the manufacture of cigar cases, leather bags, etc., and to assist them a sewing machine has been purchased. The Department of Industries has arranged to train several young *moochis* at the Calcutta Research Tannery, Entally. Stipends and other facilities have also been offered to them with this object in view.

Dubrajpur.—There are about 40 Charmakars in Dubrajpur of whom about half a dozen manufacture shoes. The rest employ their time in making drums such as *dhole*, *tabla*, etc., the leather industry with this section being a secondary vocation. The footwear made at this village is of good class. The leather used is imported from Calcutta. The *moochis*, however, manufacture slippers, etc., for the peasantry out of leather prepared by them according to local method.

BURDWAN DISTRICT.

Asansol.—There are about a dozen boot and shoe-making factories. Each employs about a dozen men and the work is carried on by hand without any help of machinery. They prepare high class boots and shoes of all shapes and sizes and find a ready market on the spot. Leather is purchased from Calcutta but sole leather is supplied by village *chamars* on the contract system.

Each shop produces about half a dozen pairs of shoes every day and the profit on a pair is about Rs. 2. The workmen are paid at the rate of Rs. 15 per mensem.

Sripur.—There are about 10 families of *chamars* in this village who live mainly by cultivation, but they also in their spare time tan hides and skins obtained locally. The process is very crude and is almost similar to that described above.

BANKURA DISTRICT.

Natoon Chati.—This is a suburb of the Bankura town and has been famed for the boot and shoe industry. There are about 40 *chamars* at this place.

The productions are of very high class and are purchased by the European and Indian gentry of the locality. An expert worker is able to earn Rs. 25 per month.

The leather is purchased from retail dealers of Cornwallis Street, Calcutta, and sometimes from a local shop.

Manufacture of lac and lac toys.

BIRBHUM DISTRICT.

Illambazar.—This is a village within the Sadar subdivision of the Birbhum district and has long been famous for the manufacture of lac *alta* (paint for ladies' feet) and lacquered articles. It is said that at one time about two hundred families in this village were engaged in this business but at present there are only two families who manufacture shellac and about a dozen more who prepare lac bangles and toys, etc.

For the manufacture of shellac, the raw lac is carefully separated from the twigs and the insects and other impurities are taken out as far as possible. The whole mass is then powdered and washed in water several times. The soluble dye is thus separated and preserved and the lac proper when dried is put into a long linen bag and heated by holding the same near a small fire. The shellac when liquid is squeezed out of the meshes of the cloth while the impurities remain in the bag. This is done by giving the ends of the bag a twist so as to reduce its capacity and to force the contents out. The dye solution is utilised for the manufacture of *alta*, i.e., the paint. The impurities referred to above which remain inside the bag during the preparation of shellac is utilised for the preparation of toys, e.g., flowers, fruits, animals and paper weights, etc. These toys are nicely painted and find a ready sale in the market.

The shellac is sent for sale to the Calcutta market through the *mahajan* whereas the toys are generally sold in the neighbouring markets. The raw material is gathered from the neighbouring villages of Ushadin, Nandar and Kanpur where it is indigenous.

The earnings of a toy maker who are Nuris by caste come up to about annas 6 to annas 8 daily.

Manufacture of shellac.

BANKURA DISTRICT.

Sonamukhi.—This industry was formerly carried on extensively all over the district but is now on the decline owing to various reasons. At present the industry seems to have concentrated at Sonamukhi and Khatra, there being about 8 small factories in the former place. Each of these factories employs about a dozen men. The methods of manufacture are almost similar to that employed at Illambazar (above) except that the workers of Sonamukhi carry the finishing operation to a stage further, that is they stretch the sheets of shellac very skilfully till they become as thin as paper forming what is called the fine shellac of commerce.

Raw material is generally purchased from the district of Manbhum, the local production having dwindled down almost to insignificance. The shellac market is constantly fluctuating and hence the condition of the enterprisers who take to this industry is precarious.

Gold and silver smithery.

BIRBHUM DISTRICT.

Dubrajpur.—There are 40 gold and silver smiths in this village of whom about 8 have migrated from the city of Dacca. The latter seem to be very prosperous whereas unfortunately the others are not so. The principal reasons for which seem to be that those from Dacca have become prosperous primarily on account of their skill and the good finish they give to their goods.

Tantipara.—There are ten gold smiths and three silver smiths here. The goldsmiths are not very prosperous as they do not get much work to do.

MIDNAPORE DISTRICT.

Patnabazar.—There are about 200 smiths representing almost all the lower castes of Hindus who live by this industry. The ornaments manufactured by them are much in demand and the workers seem to be in pretty good circumstances.

Potters' industry.

BURDWAN DISTRICT.

Rupnarainpur.—There are about 150 families of potters each employing 4 men and women on average in the villages of Alldo, Machidi and Ramchandrapur which surround the Rupnarainpur Iron and Steel Works. The potters prepare all sorts of earthenware and dispose of them in the neighbouring marts of Asansol, Barakar and other places.

The oven they use consists of a big hole dug in the earth over which a platform is raised 2 or 3 feet from the ground and is made of broken pieces of earthenwares. An opening is made in the platform for introducing the fuel in the oven. The pots after they have been sun-dried are arranged in a gallery each stratum being covered with a layer of coal, dust straw and mud before another is placed over it.

Coal, which is the cheapest fuel in this locality, is introduced in the oven and fired. The burning operation continues for about 6 or 8 hours with an occasional introduction of fuel. The consumption of coal amounts to about 5 maunds for about 120 vessels of big size and the cost of the coal is about Rs. 1-6. After the operation is over the pots are allowed to cool and are then taken out.

The loss due to breakage is, however, very considerable. Generally 20 to 25 per cent. of the pots are broken during baking and the breakages are often greater when the kilns are not properly constructed.

BIRBHUM DISTRICT.

Dubrajpur.—There are about 40 potters in this village, who prepare ordinary earthenwares.

Manufacture of Cane, Bamboo and Baskets and Chairs.

BURDWAN DISTRICT.

Panagar.—There are about 60 *Domes* at Panagar, Prayagpur, Kakea, who are engaged in the manufacture of chairs, etc., from cane and bamboo. This is their main profession and both males and females take part in the work. On an average a man with the help of his wife earns annas 8 a day and their goods find a ready local market.

BIRBHUM DISTRICT.

Dubrajpur.—There are ten families (husband and wife) of *Domes* who prepare ordinary morahs and cane chairs.

Ivory.**MURSHIDABAD DISTRICT.**

Berhampore.—There are five Bhaskar families in Khagra, Berhampore, who are engaged in ivory work. Each of these families employ about a quarter dozen of workers on the average and produce such articles as toy images, vermilion pots, small combs, safety pins, etc. They often find a local sale and sometimes send their produces to Calcutta, Delhi and the Punjab.

Each workshop consumes about 150 lbs. of raw material during the year and this is purchased in several instalments from the ivory merchants of Banstolla Lane, Calcutta. The shop-owners seem to be rich people. Workmen are paid at the rate of Rs. 15 to Rs. 30 per month.

Manufacture of Sugar as a Home Industry.**BIRBHUM DISTRICT.**

Kukutia.—This is a village about 4 miles off from Dubrajpur and was once noted for its manufacture of sugar as a home industry. There are 4 or 5 persons in this village who still carry on this industry as a secondary occupation.

One Prolahad Boja is said to have made a fortune in the above industry but does not seem to be very prosperous at the present moment. He explained to me the different stages. First of all *gur* is boiled in earthen vessels with small quantity of ashes mixed in it. The scum which separates out is removed with the help of a ladle now and then. After several hours boiling the *gur* is allowed to cool and kept in this stage for two or three days until the whole solidifies. This is then transferred into another vessel upon a layer of a particular water weed and another layer covers the surface of the solidified *gur*. The vessel which now contains the *gur* has some holes at the bottom. The liquid portion of the molasses now separates and trickles down leaving the sugar behind. The weeds have to be changed now and then and the operation takes a few days to be completed. This method is a costly one since the yield of sugar is scarcely more than 25 per cent. of the molasses and the manufacturer at the present moment cannot afford to sell his sugar less than annas 14 per seer. But this sugar has still got a few customers who do not use mill refined sugar on account of religious sentiments.

Manufacture of Paper as a Home Industry.**HOOGLY DISTRICT.**

Kalsa, Gosaimalpara and Mahanad.—There are two persons, viz., Kader Baksh and Moniruddin in Kalsa who carry on the manufacture of paper as a home industry.

Formerly the industry used to be carried on in an extensive scale in many villages of the district and the following, is a list of the villages in which there are still a few Kagjis who carry it on or know

all the processes of manufacture but have taken to other pursuits more paying than this:—

- (1) *Chaka, near Darbasini (Bengal Provincial Railway)*.—One family represented by a number of Kagjis.
- (2) *Kalsa, near Darbasini (Bengal Provincial Railway)*.—Kader Baksh Mian and nephews.
- (3) *Mahanad (Bengal Provincial Railway)*.—Feraj Sarkar, who knows all the processes, carries on the industry.
- (4) *Shahbazar, Dashgara (Bengal Provincial Railway)*.—A few families.
- (5) *Niala, Pandooah (East Indian Railway)*.—A few families.
- (6) *Mainam, Amta (Howrah Amta Light Railway)*.—A few families.

The industry however, seems to have got a stimulus for sometime past owing to the high price of mill-made paper and I met several people during the course of investigation, who were contemplating to start the business again, after a long time.

The Kagjis of this district unlike those of Murshidabad employ only waste paper and specially the cuttings from book-binders' shops as the starting material. Rags, old and worn out fishing nets of sunn (hemp), tats and jute, etc., being scarcely employed. The industry is carried on during only four or five months in the winter season and during the hot and the rainy seasons, the workers are engaged in the agricultural or other pursuits. One family, on an average, turns out paper worth Rs. 100 to Rs. 150 during each working month.

The following is a brief description of the processes:—

Soaking.—The starting material is principally gathered from the book-binding shops of Calcutta, Howrah and the neighbourhood. About ten seers of this is first steeped in water contained in a reservoir (called *Daba* locally) in which a small quantity of lime has been added. After a day or two, the mass is taken out and the water squeezed out from it as far as possible.

Pounding.—The whole mass is then subjected to the process of pounding. The operation is carried on with the help of *dhenki* or the indigenous tread-mill. 3 or 4 women work on it and this operation, which is the most laborious part of the business, takes about 8 to 10 hours to complete. The mass is then kneaded against an earthen apparatus called *mejlash*, until the whole is turned into a soft flimsy mass. This *mejlash* is a flat dish made by the country potters and has a rough surface (sprinkled with lime stones).

Second Soaking washing.—The mass is again soaked in diluted lime solution in which some *saji* is also added for about two days, then washed in a stream of water or tank holding it in a canvas *chadar*. The washing is continued until the washing water is clean.

Preparation of paper.—The pulp thus prepared is now mixed thoroughly with a large quantity of water contained in a large earthen tumbler called *nad*.

A fine bamboo sieve which has been fitted in a wooden frame is dipped into this solution, in which the pulp is now suspended in a state of fine division and is carefully taken out by the operator. The sieve with the homogenous layer of pulp on it is detached from the frame turned over

and lightly pressed against a sheet of paper. The sieve is then carefully taken away leaving the newly formed sheet of paper.

Finishing operation.—The sheet is now carefully detached and exposed to the sun for drying on a *chatai* (a green mat). When dried, it is trimmed and then seized with a thin layer of starch solution (called *monda*) which is prepared from *Ushna* rice. This is then thoroughly dried.

The paper is now stretched on a wooden board and rubbed with a cylindrical piece of stone. This is now ready for the market.

The industry is no more attractive, since as carried out, it has no chance of competing with cheap mill-made paper. The demand also is very limited, only some shopkeepers use it for making their account books. The margin of profit, if all labour consumed, are taken into consideration, is very meagre. The following figures which have been worked out on information given by the actual workers, will go to show the same.

	Rs. A. P.	Out-turn.
Cost of raw material when carried to the spot, 1 maund (40 seers on average)	7 0 0	Yielded 80 quires of paper 20 inches by 1 inch at annas 6 per quire valued at Rs. 30.
Lime, 5 seers	0 5 0	
Sajji, 2 seers	0 4 0	
Ushna rice, 3 seers	0 12 0	
Wages of 3 women to work on the tread-mill five days of 8 hours each will be required to work up 1 maund raw material. This will cost at the rate of annas 4 each per diem	3 12 0	
Wages of two skilled and one unskilled men for working actual preparation sizing, drying, trimming and polishing, etc., 8 days of 8 hours each at annas 12 and annas 6 per diem	15 0 0	
	27 1 0	
Margin of profit on each maund of raw material	2 15 0	
Total	30 0 0	30 0 0

About 4 maunds of raw material may be worked up in a month by an average family.

MURSHIDABAD DISTRICT.

Kristopur.—There are about half a dozen families of Kagjis in this village who manufacture paper mainly from “Amilapat” a kind of jute grown in these parts. The methods of manufacture are similar to that employed in the Hooghly District.

Manufacture of Conch Shell Ornaments.

BANKURA DISTRICT.

Bankura.—About 30 workers are engaged in the manufacture of conch shell ornaments, namely, bangles, rings, etc. The shells are purchased from Calcutta dealers, who import it from Cochin and Madras.

The methods of manufacture are similar to those employed at Dacca. The finish and get-up of the shell goods are decidedly inferior at Bankura. The same semi-circular saw, polishing files and knives are in vogue. The daily wages of a worker is annas ten to annas twelve. The produce find a ready market since these bangles form an indispensable article of wear with the married females of the higher class Hindus.

Vishnupur.—About 20 men are engaged in this industry in Vishnupur. The condition of the industry is similar to that prevailing at Bankura.

Patrasayar.—About 20 men carry on the industry. Similar conditions prevail.

Cutlery Industry.

BURDWAN DISTRICT.

Kanchannagar.—This suburban area of the Burdwan town has long been famous for the cutlery industry, though for some time past the industry has been in a declining state owing chiefly to foreign competition. There are at present about 15 families of Karmakars (mistries) who still carry on this industry. There are 8 small factories and some of them employ about 2 dozen workmen and the one belonging to the late Premchand Mistry possesses a 3-h.p. Hornsby oil engine and a 6-foot lathe with screw-cutting arrangements.

Knives of all varieties, scissors, razors and medical instruments are regularly made at these factories. Ordinarily the rejected cast steel files which are purchased in large quantities from the Calcutta shops serve as the starting material. These files are beaten out on an anvil until the requisite thinness is obtained. They are then cut into pieces of the required sizes and they are forged into shape. The material then passes on to the next workman, who drills the necessary holes. The third workman now improves on it, gives it a handle of horn, ivory or metal. This then passes on to the grinding shop. The first grinding is done on an ordinary grind stone obtained from Sonamukhi in the district of Bankura. The grind stones are turned by manual power by throwing a rope over the axle of the stone and by pulling or revolving it first one way then the other by pulling the ends of the ropes alternately. In the factory of Premchand Mistry the stones are worked by power. Further grinding and polishing is done on a finer stone. The last operation is that of polishing with brick dust, charcoal and oil. The finished article is then ready for the market.

The wages of the labourers vary from annas six to annas twelve per diem according to the nature of the work. Articles worth 6 to 8 thousand are manufactured annually in some of the bigger factories. Formerly the factory of Premchand Mistry used to supply cutlery and medical instruments worth several thousand of rupees annually to the Government of India. But they have been deprived of this privilege for several years past.

BANKURA DISTRICT.

Shahaspur (thana Indas).—This village was also famous for the cutlery industry, but the condition of the industry at present is similar to that at Kanchannagar (Burdwan).

About 15 families are engaged in the industry at present and make pen-knives, razors and scissors of good quality.

The methods of manufacture and other conditions are almost similar to that employed at Kanchannagar (Burdwan).

I have the following observations to make regarding this industry:—

The industry, as I have already stated, has been declining owing chiefly to foreign competition. Since the beginning of the last great war, however, it has revived a little, but these conditions of affairs, it is feared, will not last long.

The salvation of the industry appears to lie in the introduction of improved and up-to-date machinery so as to save labour and to lessen the cost of production. Besides, this, it is getting more and more difficult to secure skilled labour since the industry does not attract new recruits on account of the low wages paid. Some of the factory owners of Kanchannagar (Burdwan) are pretty well-to-do and at the same time are willing to purchase machinery if expert advice be available.

If the practice of purchasing cutlery and common medical instruments for the Government of India Stores from local manufacturers be again revived to a certain extent it would be a great stimulus to this decaying industry.

Remarks of the Director of Industries on the survey of cottage industries by the Superintendent of Industries, Burdwan Division, made during 1921.

The report of the Superintendent of Industries conveys a very reasonable appreciation of the position of cottage industries in his division. The main industries dealt with are:—

- (1) Weaving of silk and tassar.
- (2) Weaving of cotton fabrics.
- (3) Weaving of woollen blankets.
- (4) Embroidery work.
- (5) Manufacture of brass and bell-metal wares.
- (6) Manufacture of leather boots.
- (7) Manufacture of lac and lac toys.
- (8) Gold and silver wares.
- (9) Pottery work.
- (10) Manufacture of cane, bamboo baskets and chairs.
- (11) Ivory.
- (12) Manufacture of sugar as a home industry.
- (13) Manufacture of paper as a home industry.
- (14) Manufacture of conch shell bangles and ornaments.
- (15) Cutlery industry.

2. In regard to the tassar and silk weaving the Director concurs in the summary of the position given on page 27 of the report.

Steps are already being taken to demonstrate the advantages of the fly-shuttle loom, for which there is an immense need, also of improved methods of dyeing silk yarns through the operations of the peripatetic weaving instructors and the special weaving and dyeing demonstration party sanctioned by Government. The next important step, however, for the resuscitation and improvement of this industry will be the establishment of a silk weaving, reeling and dyeing demonstration school at Berhampore, proposals for which have already been worked out but action is delayed owing to the financial position. There are also suitable opportunities for the establishment of industrial weaving societies, which, as favourable conditions mature, are being brought to the notice of the Registrar of Co-operative Societies.

3. In regard to the bell-metal industry the summary of the position given on pages 34 and 35 of the report indicates the problems before the department. After careful investigation the first step to be taken, which promises direct results is to demonstrate and persuade these workers to use an improved type of mechanical hammer which will save the very considerable labour involved in beating out the articles manufactured in this industry; this labour owing to its exhausting character, is under present conditions difficult to attract. An industrial or junior technical school well equipped with modern machine tools situated in a convenient centre of this industry would also be of great advantage in demonstrating and encouraging the workers to utilise modern labour-saving tools and methods.

4. In regard to the leather and boot industry located around Suri, action has already been taken largely under the initiative of the Superintendent of Industries, to train workers who are willing to accept the training at the Calcutta Research Tannery. We are also endeavouring to persuade one or two of the apprentices now completing their course at the Research Tannery to establish a small tannery and depôt in this locality with the object of further pursuing chrome tanning and also establishing under private agency a depôt for the supply of the necessary chemicals and other material which the workers will require.

5. In regard to the pottery industry a suitable opportunity will mature for helping this industry owing to the location of the Krityanand Iron & Steel Works near one of the principal villages where this industry is carried on. The proprietors of the Krityanand Iron & Steel Co. are willing to give every encouragement to the development of the industry on improved lines. The first requisite is a suitable kiln within the means of the potters by which their products can be burnt without the considerable wastage involved in their present crude methods. The interest of Mr. Deb of the Calcutta Pottery Works has been secured and an endeavour will be made to erect a suitable demonstration kiln as soon as financial resources allow.

6. In regard to the conch shell industry an endeavour will be made to pass on to the Bankura workers the experience obtained at Dacca which is the principal centre of this industry. Mechanical means for cutting shells have been discovered and proposals have been submitted to Government for demonstrating the same on a practical scale at Dacca.

7. In regard to the cutlery industry at Burdwan the workers have been introduced to the modern methods of forging, stamping, polishing, fitting and hardening cutlery implements adopted in a modern factory such as the Union Cutleries, Ltd., Dum Dum. The principal worker in

the industry has already purchased improved machines as a result of these efforts. What is now wanted is a co-operative society of sufficient stability and standing to warrant tenders being solicited from Government departments and the execution of the same when accepted with reliability both as regards time and quality. Unfortunately there are difficulties in regard to co-operative development but the policy of the department is to persevere on these lines.

8. In regard to the lac industry the Industrial Chemist has already given considerable attention to the improvement of the means adopted by the workers for refining their lac products. Little more can be done at present until the Industrial Chemist is given further facilities for practical research.

9. The other small industries referred to by the Superintendent do not present opportunities for useful action by the department at present. It only remains for Government to provide the means to enable the department to follow up the lines indicated by the Superintendent in his report. When some measure of success has been achieved, as certainly seems possible, in regard to these major cottage industries, more attention may then possibly be given to others such as the pottery, sugar and ivory industry.

D. B. MEEK,

Director of Industries, Bengal.

The 25th June 1924.

3 DACCA DIVISION.

(Districts—Dacca, Mymensingh, Nadia and Faridpur.)

Cotton weaving.

The principal cottage industry in the district of Dacca is the weaving of cotton. The weavers may be divided into two broad classes, *viz.*, the skilled weavers of specialised cloths, and the weavers who weave cloths for domestic use. Under the former class may be mentioned those who weave muslin, figured muslin, *i.e.*, Jamdanies Kasidas and fine *saris*. The weavers of these cloths are practically limited to the Dacca City. Under the latter category come the Tantis, Jugis and Jolas who are scattered all over the district. They weave coarse *dhutis*, *saries*, *chadurs*, *lungis* and *gamchas*. The Tantis (Hindus), the Jugis (Hindus) and the Jolas (Muhammadans) are the principal castes engaged in this industry. The persons actually employed in weaving are regarded as being more or less inferior in social position. The Tantis practically limit themselves to the weaving of all the finer qualities of cloth and have an abhorrence for agriculture, but the Jugis and Jolas, who generally weave the coarser kind of cloth, have taken to agriculture as a secondary occupation, as they cannot earn a living wage by the manufacture of these cloths.

The *mahajans* and the *beparies* supply the weavers with raw material, *i.e.*, yarn, and take over the finished products from them, paying them wages at the lowest rates possible. In fairness to the *mahajans* it

must be admitted that this system is not without some advantage. It saves the weaver the trouble of obtaining his raw material and selling his products. The *mahajans* often help the man by paying him wages in advance and giving him loans if required. But the fact remains that the major portion of the income goes to the *mahajan* and the manufacturer, *i.e.*, the actual weaver, is left in poverty and ignorance. A very limited number of weavers are in a position to purchase their yarns from the retail dealers at Dacca and Narayanganj and to sell their finished products direct to the purchaser.

Dacca muslin.—Dacca was once celebrated for its muslin. The manufacture of these world-wide famous Dacca muslins has now practically ceased. The cotton for these muslins was formerly grown in the locality. It was spun and woven into muslin at Dacca, but these weavers have died out and with them the industry also. There is little or no demand for these muslins now-a-days. The muslins which are at present manufactured at Dacca are made with imported yarns and are of inferior quality. The imported machine-made yarns vary from 300 to 400 counts. There are at present only 3 Dacca muslin weavers in Nawabpur. These muslins being costly are generally purchased by Rajas and Nawabs on marriage occasions and sometimes by European as curios. It may be said that the muslin industry has practically died out.

Figured muslins.—These cloths are known at Dacca as Jamdanies. The ornamentation is done during the process of weaving by inserting an extra coloured weft into the cloth to form the figure or ornamentation, the design of which is drawn on paper as a guide to the weaver. The cloth is begun as in the case of an ordinary cloth but as the weaving goes on the weaver continuously raises the pattern paper to ascertain if he has approached the place where the design has to be brocaded in and when the exact place is reached he takes his needle (a piece of bamboo with the supply of coloured weft wound round it) and weaves it into the cloth where the pattern is required. Two persons generally work together to save time and labour. The best Jamdani is called Sheborga Jamdani, and its price ranges from Rs. 50 to Rs. 125. Another variety of Jamdani called Jaladar Jamdani having patterns of floral designs woven, as described above, is found in Dacca. A special feature of the Jamdani saris is their fine ornamental borders of gold and silver thread, with large bold corner pieces. The Jamdani saris, *dhutis* and *uranis* are prepared chiefly in Nawabpur and at two or three other houses at Tantibazar and Kaltabazar in the Dacca City. These Jamdani saris of Dacca are also very largely woven in the interior of the district, *viz.*, at the villages of Demra, Siddhiganj, Katchpur, Dhamrai, Nantee, Tarabo and Nawpara. At these villages most of the weavers have taken to agriculture along with their caste occupation and consequently sell these articles cheaper than the weavers of the Dacca town itself. The looms used in the manufacture of these cloths are primitive in construction and the shuttle is thrown by hand.

Ordinary Dacca Saris.—The ordinary Dacca saris have got a very fine embroidered border either of gold thread or dyed thread. These cloths are manufactured in the following localities of the town of Dacca:—Nawabpur, Takerhat, Mahajanpur, Kaolipara, Goailara, Lalchand Makim's Lane, Banagrām, Wari, Kaltabazar and Tantibazar.

These saris are also expensive and vary from about Rs. 5 to Rs. 50.

In the City of Dacca the looms used are also very primitive but they are employed in manufacturing cloths of all kinds and qualities. Since the last few years, however, a few of the weavers have adopted dobbin and draw boys in conjunction with their primitive looms to expedite the ornamentation on their dhutis and saris borders. The yarns are of various counts up to 400's the higher counts being only in the manufacture of muslins. In manufacturing plain bordered cloths threads of 100 or 120 counts are generally used and are obtained in the local markets. A weaver can weave $2\frac{1}{2}$ to 3 cubits of ordinary cloth per diem. They generally work from 7 to 12 A.M. and from 3 P.M. till dusk. In most cases the *mahajan* advances the money and material. If the sale price of a *dhuti* be taken at Rs. 5 the manufacturer usually gets Rs. 2 and the middlemen Re. 1, the price of the material used being Rs. 2. Dacca saris are also made at Abdullapur, Dhamrai and Baliati. The weavers at these villages have taken to agriculture as their secondary occupation and hence they can sell their products cheaper.

Ordinary dhutis, saris, etc.—As already stated in my report the ordinary coarse *dhutis, saris, chadar, lungis, gamchas, etc.*, are manufactured by the Jolas and Jugis who are scattered all over the district of Dacca. The centres of this industry are in the following villages:— Abdullapur, Mireswar, Kumarbhog, Kazirpagla, Medinimandal, Dakshin-paiksha, Haldia and Simulia in the Munshiganj subdivision; Demra, Siddhiganj, Nawpara, Rupsia, Algi, Ghorashal, Mulpara, Harihardi, Sanmandi and Sultansadi in the Narainganj subdivision; Rohitpur, Sivarampur, Rajapur and Dhamrai in the Sadar subdivision; and Bhatara, Jagannathpur, Garzana, Baliati and Rajarkalta in the Manikganj subdivision.

At these villages there are about 2,000 weavers engaged in weaving.

In the villages mentioned above, *chadars, dhutis, saris, lungis* and *gamchas* are manufactured on hand looms. Of recent years the output of such cloths have much increased owing to the large demand from outside. The popularity of these cloths is due to the fact that they satisfy the taste of the middle classes who are the chief consumers of these commodities. The weavers use imported yarn especially of British make which they purchase in the open market. An ordinary cloth which in pre-war days cost Re. 1 or Rs. 1-2 for the yarn now costs him Rs. 3. These cloths would formerly sell at Rs. 4, but now at Rs. 6. The result is that a weaver who earned Rs. 1-4, cannot now earn more than annas eight to ten per day as it takes him at least 5 days in completing a 10-cubit cloth including the time required for setting up the warp, which requires at least 2 days; to set up the warp and 3 days to weave it. The weaver takes up a set of 8 cloths together and it takes 40 days to finish the whole set. Thus, if he sells at Rs. 6 per piece it fetches him Rs. 48 and he has to pay Rs. 3 per piece for the price of the yarn, i.e., Rs. 24 for 8 pieces leaving Rs. 24 as his remuneration for labour, which means that he earns 10 annas a day of 7 or 8 hours. This is the income of an expert weaver which is much above the average. The ordinary weavers cannot earn more than 6 annas a day. The weaver works at the loom practically the whole day with intervals of rest. Generally he starts at 6-30 A.M. and works till 10 or 10-30 A.M. Then he goes to the bazar for buying the necessaries for his daily consumption, works an hour or so at midday till his food is prepared and then takes a little rest in the shape of a daily nap, and is again at his loom from about 3 P.M. till dusk.

In the district of Dacca the weavers mostly use pit looms. Fly-shuttles have also been introduced to a limited extent through the medium of the Peripatetic Weaving School. The domestic hand loom made by Messrs. Hattersley & Sons are used only in the villages of Satirpara, Algi, Mulpara, Sultansadi, Harihardi and Sanmandi and Ghorashal in the Narayanganj subdivision. Many students and men of the *bhadralog* class have purchased fly-shuttle looms and have commenced working as weavers since employment is difficult to get. Some of them have also extended the use of fly-shuttle looms among the local weavers.

The Narayanganj Iron Works and the Sarma Iron Works of Dacca make automatic fly-shuttle looms and repair the parts of Hattersley's loom when out of order.

There is no organisation for the sale of the cloths among the weavers. They either sell direct to the purchaser or make it over to the shop-keeper who advances the money. In the latter case it is sold a little cheaper. The shop-keeper or the middle-man makes a profit of 2 annas in the rupee on the purchase price. The manufacturer gets nothing but his labour. Very few of the actual manufacturers sell direct to the purchasers at the neighbouring *bat*.

The present economic condition of the weavers is far from satisfactory. The main reason is that even if the workers work hard they cannot earn sufficient for their livelihood and the maintenance of their families. The distress is not so keenly felt in the rural areas where fine cloths are woven as in Dacca where the cost of living is much greater in the city. The income of an expert weaver is 10 annas a day of 7 or 8 hours, whereas the ordinary weavers do not earn more than 6 annas a day by working the whole day.

The general condition of the industry can be improved by removing the present shortcomings which are as follows:—

- (1) None of them can work during the rains as they cannot set up the warp outside.
- (2) Want of knowledge as to the actual price of yarn, cloth and market.
- (3) More fly-shuttle looms should be introduced in the villages.
- (4) The use of dobbies and jacquards should be spread wherever possible.

To improve this industry I would suggest the opening of co-operative societies among the weavers in each of the principal weaving centres and also industrial banks in each thana from which yarn could be supplied to the actual manufacturers on more favourable terms than at present. A sale depot should also be started in each subdivision. The industrial banks should purchase their output from the weavers. They should pay a certain percentage of the price to the weavers in cash and forward the stuffs to the sale depots which will sell them. The weavers should be paid in full as soon as their cloths have been sold after reserving a small percentage of commission to meet the working expenses of the banks and the depots. This system, if satisfactorily worked out, will do away with the middleman and will no doubt improve their general economic condition to a great extent.

Industrial banks should also supply to the weavers improved looms, warping machines, etc. (with which the maximum work may be done

with a minimum of labour), at cheap rates and on the hire-purchase system.

Weaving schools should be started at each of the district headquarters where dyeing, bleaching, spinning and weaving on improved lines should be taught.

Dacca embroidery.

This includes all varieties of embroidered muslins, tea and table cloths, kumarbands, turbans, handkerchiefs, etc. This is a specialised branch of needle works. It consists of fine embroidery done in relief on white cloth or linen. The ground work of these embroideries is generally woven in villages Shannara, Dagar, Beliswar. The peculiarity of Dacca embroidery is that it is never done with cotton threads. The designs are always worked out with silk threads (either mulberry silk or Muga silk from Assam) on pure cotton or Bafta (*i.e.*, cotton and silk) cloths. When the material used, as ground work, is a white cotton cloth, Assam or Muga silk is invariably used, but when the designs are to be raised on Garad, or Tasar, Murshidabad silk yarns are used. Another peculiarity of the Dacca embroidery is that the designs to be worked out are printed on the cloths with wood-blocks.

There are two varieties of embroidery done at Dacca, namely, (1) the Chicon work proper and (2) Kasida. The fundamental difference between these two embroideries is that in the case of Chicon work the designs are worked out with twisted silk-threads while in the case of Kasidas the ornamentation is done with untwisted Muga silk thread.

The Chicon work proper is done by the cottage workers at Demra, Matuail, Siddhiganj, Nawpara to orders placed with them by the *mahajan* of the Dacca city. In these villages the work is mostly done by women of all classes, a large percentage of them being widows. Some of it, however, is done by males belonging to the cultivating class during periods when they have nothing to do in the fields. The Basaks, Tantis, Goalas, Pals, Baniks and Shahas, who are permanent residents of the town, devote much of their time to making Kasida cloth. These cottage workers supplement their ordinary income by doing this work during their leisure hours which consists of 2 or 3 hours a day. Their average earning in normal times is Rs. 4 or Rs. 5 per month and the utmost a single *karikar* can earn after doing his domestic duties is Rs. 7 or Rs. 8 only. There are three classes of people who are directly engaged in this trade. They are the (1) *mahajans* (capitalists), (2) *ostagars* (middle-men) and (3) *karikars* (the actual cottage workers). The *mahajans* are not like ordinary money-lenders. They are directly engaged in the trade, and they are the people for whom the work is done by the *karikars* at their own homes. At present all the *mahajans* belong to some big Basak family of Nawabpur in the city of Dacca. The *mahajan* enters into a contract with the *ostagars* to supply him with a required number of articles at a certain piece-rate. The *ostagar* takes over the silk threads and the cloths with designs printed on them from the *mahajans* and distributes them to the *karikars* and is responsible for the completion of the work. The remuneration given to the *karikars* varies according to the quality of the work required to be done. The *ostagars* collect the articles from the *karikars* as soon as they are finished and make them over to the *mahajans* when payments are generally made.

There is no demand for these articles in India. The *mahajans* generally export these articles to Turkey, Arabia, Algeria, Tunis, America and Paris. Sometimes the *mahajans* send their goods direct by postal parcel and sometimes through their firms at Calcutta and Bombay. The industry was in a prosperous condition some 50 years ago, but at present it is practically at a deadlock. Formerly there were from 100 to 150 *mahajans* engaged in this trade, but now there are only half a dozen of them of whom only 3 or 4 firms are doing the business on a moderately large scale. If these conditions continue for sometime longer the industry will die out in no time.

The decay of the industry is due to the following causes:—

- (1) The Kasida turban was in great demand in Turkey some years ago and was the head-gear of the people. Since the introduction of fur caps which have replaced the Kasida pugrees, the export to Turkey has declined to a very considerable extent.
- (2) The people of Baghdad have established the industry in their own country and the turbans are now being made there.
- (3) The participation of Turkey in the last war and her joining hands with the Germans had the effect of practically stopping the trade with Turkey in these cloths.
- (4) The Luxury Bill passed by France prohibits the import of all articles of luxury from foreign countries and their chicon and Kasida works have been included in the list of luxuries.

Conch shell.

The chank industry is one of the oldest industries in Dacca. The bangles prepared from the chank have from ages been looked upon as indispensable articles of dress in the case of married Hindu women. Thus the demand for these bangles, coming from almost all the Hindu families has kept this industry alive. These bangles are used all over the country, and in every district there are people who make them. The chank bangles of Dacca are distinguished from the bangles made elsewhere by their superior workmanship. The shells are also made into *churis*, bracelets, chains, rings, buttons and similar articles. The better class bangles are set in gold with pearls, rubies and other precious stones, which enhance their price and beauty. A set of *churis*, two for each hand, are worn by the better class Hindu ladies. The price of a set of plain *churis* varies from annas 10 to Rs. 4, but when ornamented with gold and set with rubies, etc., its price is considerably enhanced.

This industry is in the hands of the Shankharies who form a distinct caste by themselves. Some are very rich but the bulk of the people are poor. They live in Shankharibazar, which is in the city of Dacca. It is a narrow dark lane crowded on both sides by small shops where the manufacture as well as the sale of the bangles is effected. About 2,000 people are engaged in this industry.

The chank industry of Dacca is carried on practically on a factory basis. The bangles have to pass through different stages in the process of manufacture. One man does not complete all the processes himself. The spiral core inside the shell is broken out by a person who is expert

in this particular work and does not assist in any of the other stages of manufacture. The man who cuts the shells is an expert in his job and he limits himself to this work. After the shell has been cut into rings the polishing of the outer surface is done by rubbing it on a flat sand stone, and the inner side is polished by rubbing it against a sand covered mandril. The polishing of the bangles is sometimes done by boys. The ornamentation of the bangles is done by expert *karikars* with fine simple tools. From one shell usually four bangles are made but sometimes one shell is cut into six or eight bangles depending on the size of the shells. The two middle bangles form a pair. The two side bangles cut from one shell form a set with two sides ones cut from another shell. Rings, buttons, small figures, etc., are made cut of the parts that are left after the angles have been cut out. Out of the spirals, beads are made. The filings and chippings of the shells are sent to Malda and other places where the people purchase it at Re. 1 to Rs. 1-8 per maund for making lime. The filings obtained in the process of manufacture is said to cure small-pox and is also used for medicinal purpose.

The conch shells form the raw material of the industry come from several places, *viz.*, Ceylon, Madras, the Travancore coast and the Baroda State. The largest supply, however, comes from Ceylon but the Travancore coast and Baroda State supply a specially good quality of shells known in the local market as "Doani" and "Surti" respectively. The total annual purchases from these two sources is about 20,000 shells as compared with 10 to 11 lakhs from Ceylon and about 5 lakhs from Madras. The Dacca workers prefer white shells to those of a reddish hue. Travancore shell therefore ranks first on account of its colour and uniform size. The next in demand are the shells obtained from Tuticorin and Baroda. The Dacca Shankharies do not care much for the Ceylon shells on account of their reddish colour, but they are utilized in the making of lower grade bangles, etc. The shells obtained from the Ramnad fishery, although said to be slightly inferior in quality to the Tuticorin shells, are also used by the Dacca workers. To sum up, the quantity of shells consumed at Dacca it may be said that the largest supplies are obtained from Tuticorin and Ramnad. Those from Baroda and Travancore follow next, but in point of quantity they are negligible. The total quantity of conch shells supplied to the Dacca market from different sources is from ten to twelve lakhs.

The three Madras firms, *viz.*, O. S. M. Mahammad Tambi, J. N. Shaik Mahammad and K. Venkatasalam Chetty, control the supply of Ceylon, Travancore and Baroda shells, while Messrs. J. B. Dutt and Hemchandra Kar control the supply of the Tuticorin and Ramnad shells. Very recently the Shankharies have formed a co-operative society called the Sankha Samabay Samity. They have already secured a contract for the Tuticorin shells for two years at the rate of Rs. 210-5 per thousand and they are now trying for the Ramnad shells which they have every hope of getting.

Button industry.

Mother-of-pearl buttons.—The manufacture of mother-of-pearl buttons is another important cottage industry of the district of Dacca.

There are about 50 people who make these buttons at home in the villages of Narinda, Faridabad, Ekrampur and Sutrapur. The chief place of business, however, is at Nangalband, and the principal villages where these shell buttons are manufactured are situated within a short distance from each other in the Narayanganj subdivision. In villages Nangalband, Lalati, Kamargaon, Jindhara, Tajpur, Madhabpassa, Kulcharitra, Malikpara, Kaivtala and Barapara about 2,000 people are employed in the manufacture of buttons. At these villages buttons of various kinds are manufactured and men, women and children work at them. The work of button making is largely done by women. The men merely cut out suitable pieces from the shell and the rest of the work is done by women. Besides the above there are a large number of amateurs who make buttons during their spare time. These cottage workers thus supplement their income by making buttons.

In Eastern Bengal the principal fisheries are situated in the small rivers, canals, bils and tanks. The central pearl and shell market is at Demra in the district of Dacca. The shells are either bought direct from the fishermen, or from merchants in Demra, Dacca city, Nagalband and Narayanganj. The Sylhet shells are sold at Rs. 3 to Rs. 4 a maund; the shells taken from the Tugar river are sold at Re. 1 to Rs. 2 per maund.

The instruments used by the workers are very crude and their method of work is simple; the instruments include—

- (1) a pair of cutting pliers,
- (2) an ordinary file,
- (3) a hand drill with bits of different designs,
- (4) a hand drill for making the holes,
- (5) a small hand-driven grind-stone mounted in a wooden trough containing water in which the stone revolves,
- (6) a wooden box or a small packing case about a foot high which serves as a low table for the operator who works sitting on the ground. This is covered with a piece of gunny sacking which serves to secure the buttons during the grinding and drilling and other operations.

In preparing the buttons, the operator first cuts the mussel shells with a pair of cutting pliers into pieces about $\frac{1}{2}$ "to 1" square. These are then placed on the piece of the gunny cloth which is spread over the wooden box. This gunny cloth prevents the pieces of shells from slipping during the operation of cutting and drilling. The pieces of the shell are marked or partially cut with the end of the hand drill and bit. The edges are next trimmed off with the cutting pliers, or with a file and finally they are rounded off and finished by means of the grinding stone; the button being held with one hand and the stone rotated with the other. Two or four holes are then drilled in the buttons according to requirements. The principal market for the manufactured buttons is at Nangalband where markets are held every Friday. All the button makers in the manufacturing villages bring their products to this market for sale. Some of the button workers however bring their buttons for sale to the Dacca market in the hope of getting a higher price for them.

In the town of Dacca there are a good many middle-men who advertise themselves as manufacturers of mother-of-pearl buttons. As a

matter of fact they are not manufacturers. Whenever they secure an order from outside they go to Nangalband to buy buttons as far as possible according to samples which they supply to their customers. Sometimes, it happens that they do not get buttons exactly like the sample ones supplied by their customers. The result of this is that the customers get annoyed with their order suppliers, who subsequently change the names of their firms, and by substituting new names secure fresh business. The buttons as manufactured by the cottage workers are not of uniform shape, size and thickness nor are the holes in the buttons equidistant from each other. To remedy these defects the buttons manufactured should be standardised and there should be a sale depôt. The formation of a co-operative industrial society amongst these cottage workers is essential, before any general improvement in the manufacture and sale of the shell buttons can effectively be introduced. But the question of finance is a complicated and essential point, and this should be decided first. In addition to pearl buttons various kinds of ornaments such as ear-rings, nose-pendants, hair ornaments and watch chains are manufactured from mother-of-pearl shells in the suburbs of the Dacca town. These however are not made on a large scale. If large quantities are required, they have to be specially ordered. Most of the instruments used in the manufacture of buttons are also used in making the other articles referred to above as ornaments, the only additions being a special drill and a few files.

Horn buttons.—There are about 100 people engaged in manufacturing buttons from horn at the following places of Dacca city, e.g., Choudhuribazar, Amligola and Nawabganj. They are all Muhamma-lans by caste. The buttons are made from the solid portions of the horn. They use practically no machinery. The horn is first chiselled off to give it a cylindrical shape. It is then fixed by means of a clamp to a hollow horizontal spindle fixed in bearings round which passes a fiddle string by which it is made to rotate. Buttons are cut out of the solid horn by bringing a chisel to bear against it while revolving. The polishing is done with a leather dipped in a composition of charcoal and oil which is brought into contact with the buttons on the lathe while revolving. This gives the buttons a polish. No buffing is done. The holes in the buttons are drilled by a bow drill. The cottage workers obtain the solid portions of the horn from the local manufacturers of horn combs. The buttons are well made but there is very little demand for them. These button makers also make toys and snuff boxes nicely engraved from solid horns.

Metal buttons.—Gold, silver and brass buttons are manufactured by Messrs. S. N. Basak & Sons at 35/36, Nawabpur, Dacca. There are about a dozen persons employed in this industry. The process of manufacture is kept a secret. The raw material is said to be obtained from Calcutta. The finished buttons are sold through agents.

Horn combs.—There are some 40 people at Amligola and Churhatta in the suburbs of the city of Dacca, who manufacture horn plates. They are all Muhammadans by caste. They get their supply of horns from the wholesale merchants at Calcutta. The process of making horn-plates previous to their being made into combs is very simple. The hollow portion of the horn is separated from the solid by cutting it transverse-ly with a hand saw. The solid portion is disposed of for the manufac-turing of horn buttons and toys, etc. The hollow portion of the horn

is then cut longitudinally into 2 pieces. These pieces are then put on a charcoal fire. When the horn is sufficiently heated and has become soft it is flattened with iron tongs. When the horn is partially flattened out and is still soft some heavy weights are put on it to flatten it further. The charred portions of the horn plate are then removed with an edge after the plates have cooled down. From these horn plates buttons and combs are manufactured.

Buttons from horn plates are made at the Narayanganj Button Factory and the Dacca Coronation Button Factory.

There are 50 cottage workers in Churihatta, a suburb of Dacca, where they make combs from horn plates. They cut the horn plate to the required size and then with a hand-saw the teeth of the comb are cut. Sometimes, some of the combs are ornamented. They are then finished and polished by rubbing them with a brush dipped in oil and charcoal powder. These combs are very strong. They have an extensive sale in the mufassal villages.

Match industry.

In the district of Dacca safety matches are manufactured by the following firms:—

- (1) Govinda Match Factory at Paikpara, Narayanganj.
- (2) The Narayanganj Industrial Company, Narayanganj.
- (3) The Bharat Mata Match Factory at Dacca town.
- (4) The Bikrampur Match Factory at Autshahi in the Munshiganj subdivision.

They use a hand machine devised by Dr. Nandy of Comilla for the making of the match splints and boxes. The Vikrampur Match Factory has installed machines constructed and supplied by the Narayanganj Iron Works. The total number of labourers engaged in these factories is about 60. Besides these workers there are a large number of poor villagers, especially women and children, who are employed on piece-work (e.g., pasting match boxes and labelling the same, etc.) in connexion with this industry.

The wood used for the sticks and boxes is Chhatian, Kadam, Debbaru, Barun and Simul. Three machines are generally employed. They are practically the same in principle. The first machine slices the wood into the required thickness of the match sticks. Several of these slices are then placed one above the other in the second machine which cuts them into match sticks. The third machine slices the wood for the match boxes and makes them with a partial cut where the folding is to take place for the four sides of the box. The match sticks or splints when cut from the block of wood are long enough for two. These splints are then tied together into bundles and put over a heated iron plate to carbonise the ends. The ends are then dipped into liquid paraffin wax, for about a quarter of an inch from the ends. After this the bundle is united and the sticks are arranged in frames to be tipped into a prepared paste containing oxidisable substance, e.g., manganese dioxide, potassium chlorate, sulphur and fine sand and glue. The tips are then allowed to dry a little after which the sticks are cut into two equal

pieces. The match sticks so prepared are dried in the sun and are then put into boxes. The paste on the prepared surface of the boxes contains red phosphorous, manganese dioxide and glue. The matches are stored for a month or so before they are sold to the public. The daily outturn is 8 to 10 gross. The expenses in making a gross of match boxes is Rs. 2-6 and the wholesale price is Rs. 2-14 per gross.

The system of framing the sticks previous to tipping process is rather laborious and tedious.

Neither the match heads nor the striking surfaces of the box are damp-proof. When the matches are struck or rubbed against the prepared surface, the match heads come off and the paste on the striking surface rubs away. If the matches are stored for 3 or 4 months the match heads seem to improve a little but they are not perfectly damp-proof and the match sticks get dirty, their lustre disappears and fungus growth develops on them.

As regards the wood the proprietors of factories generally get their supply from distant places and collect a sufficient quantity for one year's consumption. When the wood gets too dry, the sticks cannot be cut from it easily.

The manufacture of matches as a cottage industry with the aid of hand machines hardly stands a chance of competition with the large factories employing up-to-date machinery and steam power to drive them.

Brass and bell-metal industry.

In the town of Dacca there is a colony of braziers and coppersmiths at Thataribazar who make bell-metal ware for domestic use. In the interior of the district the industry is carried on mostly in the villages of Lohajang, Firingibazar, Abdullapur, Sholaghur in the Munshiganj subdivision and Dhamrai in the Sadar subdivision.

The total number of persons engaged in this industry is about 1,000.

The artisans are both Hindus and Muhammadans. The Hindu colony originally migrated from Murshidabad, and the Muhammadan artisans who have now set up independent shops were workmen in the employ of the Hindu artisans.

There is a class of men called Paikars who travel through the mufasal villages and collect rejected utensils which they make over to the *mahajans*. These *mahajans* get the old utensils melted down and make them into new ones by remelting and beating out.

The following are the common domestic utensils manufactured:—

- (1) Bell-metal *rekabies* (dishes) of different sizes.
- (2) Bell-metal *thalis* of different shapes and sizes.
- (3) Bell-metal cups and bowls of different shapes.
- (4) Brass-metal pitchers of different sizes.
- (5) Brass-metal *ghatis* (*lotas*) of different sizes.
- (6) Brass-metal spoons of different sizes.
- (7) Brass-metal bowls of different sizes, etc., etc.

Bell-metal utensils are exclusively made by melting down the metal of old vessels. Of all the alloys made locally, "Bharan", a mixture of copper and zinc, appears to be the principal one. The two methods usually followed in the manufacture of these utensils is (1) the hammering out, (2) casting into moulds. The first is almost exclusively resorted to in the district. The braziers with the help of their hammers and furnaces, heat and beat out the plates to any shape they want. The majority of the workers in bell-metal, brass and copper utensils suffer from the same disadvantage as the weavers, and are not in direct touch with the actual consumers. This industry is almost entirely in the hand of the *mahajans*.

Mahajans, paikars and manufacturers are the different classes of men who take part in the brass and bell-metal industry. Excepting the *mahajans* the other classes are paid on the *dadan* (advance) system. The *mahajans* are the capitalists and advance money. The average income of a worker varies from Rs. 15 to Rs. 20 a month. There is a big centre of trade for brass articles at Lohajang, Dhanrai and Thatari-bazar. The brass is bought in sheets from Calcutta.

The makers cannot sell the utensils independently, as owing to the *dadan* system they are under the control of the *mahajans* to whom they have to supply all the articles prepared by them. The whole output of the workers is made over to the *mahajans* and as they supply the raw material, pay the wages of the workers and naturally claim the goods. Local shops do not advance capital to the manufacturers, but they do so to the *mahajans* and get their things through them.

It is clear from the above that the most important help which this industry can receive would be in the direction of the better adjustment of capital and labour. If the industry is to flourish we must try to improve the financial position of the artisans and free them from the clutches of the *mahajans*. It will be of little avail to teach the artisans more improved mechanical methods, if the lion's share of the profits is to be appropriated by the *mahajans*. The establishment of a co-operative society among them and the starting of an industrial bank is the first thing necessary to improve the industry.

Soap industry.

Toilet soaps.—These soaps are manufactured by Mr. Takeda. His workshop is at Wari in the city of Dacca. About 15 men are working under him. He makes scented toilet soaps of various shades and colour. To make these soaps he uses cocoanut oil and caustic soda which are imported from Calcutta. He has a few boiling pans and hand machines for cutting and stamping the tablets. For ordinary purposes these soaps are quite good, and also very cheap, but they are not quite neutral. These soaps have a good sale amongst the middle classes and the poorer people.

Mr. Takeda is a soap expert but has not been able to start a factory with up-to-date machinery for want of capital.

Washing soaps.—These soaps are manufactured in Imamganj, Narinda Baburbazar, in the city of Dacca, where about 60 persons are engaged. They manufacture ordinary crude washing soap, locally called *Bangla Saban*.

The chief ingredients for the manufacture of *Bangla Saban* are—

- (1) fat and oil,
- (2) caustic soda,
- (3) silicate of soda,
- (4) washing soda and
- (5) talc or China clay.

These are imported from Calcutta.

Apparatus generally in use—

- (1) single-bottomed iron pans,
- (2) hand paddles made of iron,
- (3) iron spades and trowels and
- (4) earthen cups.

Process.—At Dacca as wood fuel is much cheaper than coal, it is used commonly to feed the fires. Big iron pans or cauldrons are used for boiling the oil and fat in. They generally make use of the cheapest oils and fats, e.g., moya oil, mustard oil, cocconut oil, in fact any oil or fat which can be obtained cheaply in the market. These oils and fats are never purified. They put the oil or fat into the boiling pans, as they are obtained from the market. Caustic soda solution is gradually poured over the oil and fat after they are heated. This caustic soda is of low grade quality contains from 60 to 70 per cent. sodium oxide. The caustic soda solution is of varying strength. The soap makers never make use of any hydrometer to measure its strength. They have just a rough idea about the quantity of caustic soda required to be used for a given quantity of fat and oil. No heed is paid to the purity of water used in making the caustic solutions. As soon as the caustic soda solution is poured into the heated oil and fat, the contents in the pan is constantly stirred to prevent "fobbing". The soap is then allowed to boil for 7 hours. Occasional stirring is necessary to prevent the soap from getting charred by excessive heat. When the boiling is nearly complete they subject it to a rough test and as required the oil or soda solution is added and the boiling is continued. When the boiling is nearly complete the fire is put out and the soap is allowed to settle. No salting is done at all. After a day or two the fire is kindled again and the soap is heated. Then filling materials, e.g., silicate of soda, washing soda, talc or China clay are mixed with the soap according to the quality of the soap required. Small quantities of the semi-solid soap is put into earthen moulds to give it the necessary shape. These washing soaps, far from being neutral, contain all the impurities originally contained in the ingredients. However the soaps have good washing properties and they command an extensive sale in Dacca, Mymensingh and Assam.

The soap-makers generally have shops of their own where they do wholesale and retail business. They also have selling agents all over Bengal for the disposal of their soaps.

Paper-making.

In the village of Arial under Tangibari police-station there is a class of people called Kagojis who make paper by hand. It is said that some 20

or 20 years ago, seven or eight hundred families living in the vicinity were engaged in this industry and made a living out of it. At present only 10 or 12 families are employed in paper-making but not as a whole-time occupation. The process of paper-making as locally done is as follows:—

Jute fibre is principally employed for this purpose. It is mixed with pure lime generally obtained by burning shells. For one maund of jute 7 or 8 seers of lime are diluted with water and the fibres are well mixed and allowed to steep in the solution. The jute is then taken out, dried and pounded in a *dhenki* so as to reduce the fibre to pulp. The pulp is then put in a sack and immersed in water so as to remove the lime. When the pulp is freed from the lime, it is put into a large receptacle containing water, which is agitated so as to dissolve it and to allow the particles of jute to be in suspension. A specially constructed sieve with raised edges is introduced into this mixture with the result that the particles of jute in suspension are deposited on the sieve which when raised allows the water to drain off leaving the pulp on the meshes of the sieve in the form of a sheet. This sheet of fibre is then lifted up from the sieve and is placed on a smooth mat or board and allowed to dry.

The next process is the starching of the paper and this is done by passing it through a starch solution made of unboiled rice. The paper is again dried after which it is compressed, polished with a hard smooth stone, cut into sizes, packed into reams and sold in the market. This paper is chiefly purchased by astrologers, horoscope-makers and the local book-binders, as it is said to be stronger than the machine-made paper and not so easily destroyed by insects. The cost of the paper is Rs. 5 to Rs. 6 per ream depending on its quality. From one maund of jute 5 or 6 such reams of papers are made and it takes 3 men 8 to 10 days to prepare it.

Articles of leather.

In the town of Dacca a gentleman named Promodaranjan Bose manufactures high class leather goods at his own residence at 19, Hatkhola Road Takatooli. He started this industry about a year ago and has invested about Rs. 3,000 in it. He employs 7 workmen of whom 3 are up-country cobblers, 2 Muhammadan duffries and 2 Hindus who do the finishing and glazing. Their average pay is about Rs. 35 per month. The average out-put of leather goods is from 50 to 60 cases per month. These include leather trunks, suit cases, attaché cases, ladies' bags, wallets, fancy writing cases, etc., and the quality of the goods are such that they are greatly appreciated and patronised by both European and Indian gentlemen. The sales are conducted through his friends and acquaintances.

The Rishis and Muhammadan Kashais purchase cow hides and goat skins from the villages. They cure these hides with salt and mud and sell them to the hide merchants of the Dacca town. Sometimes these hides and skins are partly tanned with vegetable tanning materials. Out of these tanned leathers the Rishis make sandals and slippers which they sell in the local market. They are generally not of good quality and finish. There are about a dozen Rishi families in the town of Dacca who make good boots, shoes and slippers which are much cheaper than the imported articles. The *moochis* of Lakshmi bazar in the town of

Dacca make durable shoes of good pattern and quality. They purchase chrome leather from Calcutta and make shoes out of it. The trade of finished articles has for some time past been in the hands of Muhammadan dealers. As the city of Dacca is one of the chief centres of the hide trade it is one of the best places for starting a tannery.

Boat builders and carpenters.

Dacca being a riparian district most of the land is flooded during the rains and the country boat is the only means of communication. Boat building is in consequence a lucrative occupation and boat-makers are to be found in almost every village.

The chief manufacturing centres of such boats are the following:—

Munshiganj subdivision.—Rohitpur, Jibanandipatti, Autashahi, Tastipur, Dorabati, Bejgaon, Nagarbhag, Sindurdi, Rana, Jurashar, Kalikal and Pakira.

Manikganj subdivision.—Duragram, Satura, Narikuli in the Satura, thana.

Sadar subdivision.—Singara, Jantrail, Bandura in the Nawabganj thana and Rohitpur in the Keraniganj thana.

About 800 people are thus engaged in this industry who are Sutradhars and Namasudras by caste. The secondary occupation of all the boat builders and carpenters is agriculture. Their chief income is mostly from jote lands.

They purchase timber from the wholesale timber merchants at Lohajang, Haldia, Deulbhog, in the Munshiganj subdivision, Keraniganj, Kumarganj, Nawabganj and Bandura in the Sadar subdivision and Satura in the Manikganj subdivision.

It takes about a week or so to make a small *dingi* and about a month to make boats of bigger sizes. The *dingis* are sold at Rs. 10-15 each and the price of big boats ranges from Rs. 50 to Rs. 250. (All of them use simple tools which are repaired and sharpened by themselves.) The average monthly income of a boat builder varies from Rs. 8 to Rs. 10.

Dacca city is famous for its "house" or green boats and they are purchased by most well-to-do persons who have to travel inland during the monsoons. Dacca mistries are in requisition all over the province either to build or to supervise the building of such boats. A fairly comfortable "house" boat can be constructed for Rs. 2,500 or so.

The means of locomotion of all the country boats is very slow, and it would greatly improve matters if some arrangements could be made to accelerate their speed at a reasonable cost by the attachment of motors.

Carpenters.—Carpenters are to be found in the villages mentioned above. They use foreign as well as country-made tools and their average income varies from Rs. 15 to Rs. 20. The town carpenters generally make articles of furniture whereas the village carpenters generally spend their time in constructing corrugated iron sheds, doors, windows, etc.

Pottery.

Potters are found all over the district. The chief centres are in the following villages in:—

Sadar subdivision.—Galimpur, Jafrabad, Sultanganj, Sibpur, Rayerbazar, Simulia, Mamlamir and Golla.

Manikganj subdivision.—Kayannara, Nihalpur, Khaliabad and Gopalpur.

Munshiganj subdivision.—Pashail, Autshahi, Gaupara, Madhyapara, Dakshin-Charigaon, Tantar, Srinagar, Singpara, Fegunashar and Furshail.

Narayanganj subdivision.—Nagadiki, Birbaghber and Chandanpur.

The total number of persons engaged in this industry is about 8,000. The potters purchase their clay at Rs. 50 to Rs. 100 per bigha. They purchase sand at Rs. 25 or Rs. 30 per 100 maunds in parts of the district where sand is not available. With the help of the potter's wheel, earthen pots of different kinds are made. They are then dried in the sun and burnt. There is about 30 per cent. breakage in the process of burning. The *beparis* purchase their articles from the potters and take them for disposal to the villages and neighbouring districts where there are no potters. The *beparis* exchange their articles for paddy and sometimes receive cash payments for the articles sold. The potters as a class are all Kuntars. In the town of Dacca alone there are about 400 families of potters. Their average monthly earnings range from Rs. 5 to Rs. 15. There is not much scope for the improvement of this industry unless they learn the higher branches of pottery and try to make cups, saucers, jars, etc. With the growth and prosperity of the people these earthen wares are being gradually replaced amongst the Hindus by metal utensils of copper and bell-metal. The Muhammadans are beginning to use enamelled ware for their daily household use.

Pati making.

This industry is carried on at the following villages of the Dacca district:—Dhaidia in Tangibari thana, Fegunashar and Rajdia in the Sirajdigha thana and Bidgaon and Banari in the Rajabari thana.

The total number of persons engaged in the industry is about 200 and the monthly average income of each worker ranges from Rs. 8 to Rs. 10.

Each family has got about a bigha of land to grow mat grass (*motra*). The males till the land and do sundry other work, while the female weave mats by hand. A mat of the best quality (10' × 6') is usually sold at Rs. 5 and ordinary mats are sold at Rs. 3.

The *patis* are never manufactured on a commercial basis, but they are generally meant for local consumption. The workers are very poor and are in need of pecuniary assistance. Their condition could be improved if a suitable market was found for them where they could sell their goods readily and at more lucrative prices. At present they come to the town with 10 or 12 *patis* and hawk them from door to door. Those who are well-to-do sell their stuffs at the neighbouring market or *hât*.

Oil cloth industry.

In the city of Dacca oil cloths are manufactured by the Standard Oil Cloth Company. The proprietor of the firm is Babu Supati Ranjan Nag. His workshop was formerly situated at his own residence at 20-A, Raja's Dewri, but it has recently been removed to Wari. My Nag has invested some Rs. 500 in this business. He has engaged 2 workers at Rs. 7 per month and allows them free food and lodging. Nagpur drill cloth or American drill cloth is generally used. The drill cloth is dipped into a mixture of zinc oxide, boiled linseed oil and another chemical. Winter green is used to counteract the smell of the linseed oil. The drill cloth when impregnated with the water-proofing material is stretched in the shade to dry. It is then rubbed with an emery pad and finished. Colouring matter is used to give different colours to the finished cloth. The retail price per yard is Rs. 2-8 and the wholesale rate is Rs. 2-4. These waterproof cloths have good markets at Dacca and Chandpur. It is also sold in other parts of this province to a limited extent.

Another oil cloth factory has been started at Malkhanagar village in the Munshiganj subdivision by Babu Bhupati Nath Bose. The material manufactured by him is also of good quality. The retail price per yard is Rs. 2-8 and the wholesale price is Rs. 2-4.

Jute weaving—rope and string making.

Gunny bag-making is done in the villages of Krishnapur in the Narayanganj subdivision, Kalma, Bashail and Noadda in the Tangibari thana and in the Munshiganj subdivision by a class of men known as Kapalis. About 120 people in the above villages are engaged in this industry. These people spin jute twine by hand and weave gunny cloth. Their products are quite good but the price does not compare favourably with mill-made gunnies. There is no caste prejudice against this industry. Women are not employed except in parts of the Narayanganj subdivision. A villager unless he is well-to-do makes his own ropes and strings.

Goldsmiths and silversmiths.

A large number of people of this district are employed in this business, not only in the city and interior of this district, but in many places in Eastern Bengal. Dacca goldsmiths are famous for their superior workmanship. They are to be found in the following villages of:—

Munshiganj subdivision.—Pashail, Firingibazar, Nagar Kasba, Bejgaon, Kukutia, Malapdia, Ichhapura and Srinagar.

Manikganj subdivision.—Daragram, Safulli, Pathrail, Gangalapur, Bahati, Bhatra, Kazikola, Dauatpur and Jaidehpur.

Salar subdivision.—Galimpur, Sonabaju, Hagradi, Meghula, Kaliganj, Paragaon, Kaundia, Syampur and Bathuni.

Narayanganj subdivision.—Ghosegaon, Gotasia and Araihasar.

Dr. Tayler says: "The Dacca workman excels in filigree work. They make bracelets, neck chains, ear-rings and other ornaments and also vessels for attar and rose water, all of which are sent to different parts

of the country." There is in Dacca two definite castes of gold and silver workers. The industry was formerly in the hands of Swarna Baniks but now the Karmakars have the monopoly. Dhobis, Napits, Kumars Basaks and even Mussalmans are engaged in the trade. In the matter of ideas they are conservatives. The average earning of an ordinary worker is Rs. 15 to Rs. 20 a month. The rate for simple silver work is annas 4 a tola. For fine work as much as Re. 1-8 per tola is charged. For gold work Rs. 2 to Rs. 5 is demanded. For fine work the charge is sometimes Rs. 15 per tola where there is a chance of a diminution in weight.

Blacksmiths.

The village blacksmiths make *daos*, sickles, axes, spades, *khantas* and nails of various sizes. Some people can make scales and hammers. The manufacture of iron implements and tools is carried on on a comparatively large scale at the Srinagar police-station in the Munshiganj subdivision. The blacksmiths are also found in the following villages:—

Sadar subdivision.—Kadamtali, Subhadya, Mushankhola, Chowhat, Dhamrai, Srifaltali and Ramnagar.

Manikganj subdivision.—Safulli, Kayannara, Kazikola, Daulatpur, Jhitka and Lesraganj.

Narayanganj subdivision.—Pravakardi, Manahardi, Cotasia.

Munshiganj subdivision.—Bahar, Firingibazar, Autshahi, Kanda-para, Kukutia, Madhyapara, Makoohati, Kola, Routhbhog and Ichhapura.

The implements in use are of the most primitive kind consisting of a blow-pipe, a hammer and an anvil and a few other minor accessories. The work is done in batches of two working together. Each batch can make 5 or 7 seers of nails working 8 or 10 hours a day. Spades and nails are also imported from abroad and have a better finish than the local articles. The local made articles are cheaper and so do not suffer much from competition. The blacksmiths earn Rs. 15 to Rs. 25 a month.

Braid making.

There are two braid makers at Farashganj in the city of Dacca. These braids used to be imported from Austria in pre-war days. About 20 persons are now engaged in this industry who are all local people. Their wages vary from Rs. 3 to Rs. 15. The thread is obtained locally and is imported from Cawnpore and Calcutta. The braid manufactured is sold locally and is also exported to Calcutta, Rangpur and Madras.

Fishing nets.

In the district of Dacca fishing nets are made in the following villages:—

Manikganj subdivision.—Daragram, Safulli, Atipara, Krishnapura, Nihalpur, Ujanpara, Basantapur, Mendipura, Brahman-kanda, Kotalia, Dubail and Paikpara.

Sadar subdivision.—Charakhali, Baktarnagar, Narisha, Iskhakabad, Baliarket, Beliswar, Bathuni, Srirampur and Sutrapur.

Munshiganj subdivision.—Srinagar and Chur chayet.

East Bengal is very rich in fisheries and a large number of the people who are Jalias, Malos and Nikaris by caste live by catching and trading in fish. Fishing nets are made by the fishermen themselves and this industry is localised in the above villages. They do not generally sell their products but make nets for their own use. With them the making of nets is a secondary occupation—their principal one being fishing. They obtain their threads from the nearest bazar or *hât*.

These nets are made both by males and females during their leisure hours. To improve the economic condition of the fishermen I would propose the starting of schools in the important fishing centres where making of fishing nets, curing and preserving of fish may be taught to them.

Sealing wax.

Messrs. S. Douche & Sons of Bahadurpur Lane, Faridabad, Dacca city, manufacture sealing wax as a home industry. The proprietor of the firm is Babu Sachindra Chandra Das. He has invested about Rs. 10,000 in this industry. The number of labourers employed is 15 of whom 1 is a male and the rest females. The only male worker is paid at the rate of Rs. 13 per month, the female workers get from Rs. 7 to Rs. 9 per month. The working hours are from 6 A.M. to 3 P.M. As regards the raw materials used in the manufacture of sealing wax Mr. Das gets (1) shellac from Assam and Messrs. Angelo Brothers of Calcutta, (2) rosin from Bareilly and calcium sulphate, cinnabar, vermilion and ultra-marine and other colouring materials from Calcutta. The process of manufacture is kept secret. The quality of the goods manufactured is good. The daily out-turn is about 8 maunds. The principal markets for the finished articles are at Dacca and Calcutta. The firm has secured contracts to supply sealing wax to the Bengal-Nagpur and Assam-Bengal Railways. The wholesale price is Rs. 6-12 per gross and retail Rs. 9.

Penholder making.

Babu Kshitish Chandra Guha, Pleader of Lakshmibazar and the Proprietor of City Carriage Works, manufactures penholders. The total number of workers engaged is 16. All of them are Muhammadans and are paid at Rs. 15 each per month. There are also 6 or 7 such workshops at Dacca.

Small logs of Bel, Kamini and Kachua wood are imported to Dacca by boat from Comilla. They are kept under water until used up.

A small hand drill, a primitive lathe and a half round chisel is used in making the handles.

The metal parts are done at a contract rate of Rs. 8 per thousand. Their daily output is from 600 to 800 handles. These handles when painted, varnished and finished, look quite decent and are sold at Rs. 3 to Rs. 8 per gross.

The markets for these articles are at Dacca, Mymensingh, Rangpur, Dibrugarh and Calcutta.

Cur making.

Molasses (*gur*) is prepared by boiling the juice extracted from sugar-cane. This industry is carried on on a big scale in parts of Narayanganj, Munshiganj and North Sadar subdivision. Iron presses supplied by Messrs. Renwick & Co., on the monthly hire system are available at Munshiganj from where they are distributed to the interior of the subdivision. Out of *gur* various preparations locally known as *tilai*, *kadma*, and *batasha* are made. Sugar is extracted from date palm in Jhitka and the neighbouring villages of Manikganj subdivision and it is known as *hazari gur*. About eight to ten thousand maunds of *hazari gur* are annually exported. This is the best kind of *gur* available in the district and commands a ready sale on account of its white colour. It is sold at 6 annas per seer.

Basket making.

This industry is ordinarily carried on by low caste Hindus and sometimes by Muhammadan *karikars* in the following villages of Dacca:—

Munshiganj subdivision.—Marichadi, Imamchar, Telkhira, Aushahi Gawpara, Baherkuchi, Kakaldi, Kaykirtan, Rathbari, Fegunashar and Sialdi.

Manikganj subdivision.—Lesraganj, Jhitka, Simulia, Mahadabpur, Kanchanpur and Dubail.

Sadar subdivision.—Sadapur, Nayabari and Barha.

They make baskets, cane boxes, chairs, easy chairs, trays, luncheon baskets, moras, fans and fish traps. The males and females utilise their spare time in the manufacture of the above articles. They buy bamboo at 4 to 6 annas a piece and the turn over gives them a profit of 3 to 4 annas.

Book-binding.

There are about 20 book-binding shops in the city of Dacca employing 4 to 7 men each at rates varying from Rs. 4 to Rs. 7. Owing to the high prices of raw materials the business is not as remunerative as before. People following this business are now turning their attention to other occupation.

Tailoring.

Dacca tailors are to be found in practically all the districts of the Dacca division, *viz.*, Srinagar, Mirkadam, Lohajang and Taltala of the Munshiganj subdivision, also in Nawabganj, Sabhar and Keraniganj thanas where there are about 300 tailoring shops employing about 800 workers. When the business is more than one man can cope with, the tailor ordinarily employ assistants on Rs. 12 to 14 a month each. Sometimes the tailor's shop is owned by a person who does not know the trade himself. To carry on the work successfully he employs a head tailor who usually gets Rs. 20 a month. In the city of Dacca there are about 125 shops. There is a combination amongst tailors and they have fixed a rate of pay.

[For the remaining districts of the Dacca Division, viz., Mymensingh, Nadia and Faridpur, please see the Supplementary Volume of this Report.]

- (2) Embroidery work.
- (3) Conchshell workers.
- (4) Button and comb making.
- (5) Brass and bell-metal work.
- (6) Tanning and leather work.
- (7) Boat building.
- (8) Basket making.
- (9) Miscellaneous industries including matches soap, paper, pottery, (*pati*) mats, fishing nets, jute spinning and weaving, black-smithy, carpentry, etc.

In regard to the weaving industry which is perhaps the most important cottage industry in the Dacca district, the Department has already effected considerable improvement by the demonstration work in regard to fly-shuttle looms and the use of jacquard and dobby attachments. There is, however, room for considerable demonstration work in further educating the workers to the advantages of these improvements. Undoubtedly the next important step to be taken is that of the establishment of the long projected weaving school at Dacca which now only awaits the provision of funds. With the establishment of this school thus creating a focus for further developments in this district there is no doubt that impetus can be given to the weaving industry. It will also greatly facilitate the work of persuading the weavers to form themselves into co-operative societies.

Embroidery industry.—Undoubtedly the *kashida* and embroidery work of Dacca has fallen on evil times. The first step to be taken is to regain a wider market for the product. Endeavours are now being made to bring the products of this industry to the notice of the American and London markets. Correspondence and samples are now in process of transmission to Messrs. Liberty's with this object in view.

Conch-shell industry.—This industry is one almost entirely identified with Dacca and the Department is fully aware of the unique opportunity presented by it. A considerable range of experiments have been carried out which have successfully demonstrated the possibilities of improving substantially the methods adopted by the workers in cutting up the shells. The leaders of the industry have felt the need of such improvements in as much as the skilled labour available for cutting the shells is stated to be a diminishing factor. The experiments have proved that a thin elastic grinding disc can cut the shells as accurately and more economically than the hand-workers with their indigenous saw. Such discs

made by the Norton Grinding Co., of America, are now in course of transmission to India and with the necessary funds placed at the disposal of the Department, and in response to the invitation of the leading workers who have seen the experiments and reported on the results favourably a demonstration will shortly be given in Dacca. Considerable improvement in regard to the supply of shells has resulted from the formation of a co-operative society and the efforts of the numerous Government officers, to obtain supplies of shells from the Madras Fisheries Department direct to this society.

Button industry.—In the case of this industry there is also the need for demonstrating improved mechanical machines of a simple type and within the range of the workers' need and means. Following up such a demonstration it should not be difficult to establish co-operative societies. The Director of Industries, Bombay, has a Button Expert on his staff and it is understood that considerable improvements have been effected on the Bombay side as the result of his work. The Director of Industries, Bombay, has been asked to place all the information available with him at our disposal with the object of putting forward a small demonstration cottage factory scheme with the above object in view. Here again further work will be held up until Government are able to place funds at the disposal of the Department.

Tanning industry.—It has long been known that owing to its peculiar importance in the hide trade Dacca offers a *primâ facie* opportunity for the establishment of a successful tannery and leather factory in Dacca. Information has already been given to a number of interested workers and the Superintendent of the Research Tannery has on more than one occasion visited Dacca with the object of placing before the community the possibilities of such a scheme and the ways and means required for developing it. It is hoped that in the near future suitable private persons will carry on the matter to practical effect.

In regards to the other miscellaneous industries help and advice of this Department has been given in numerous instances. Beyond this it is impossible to go at present until the facilities required by the Department for completing and making good the major opportunities referred to above have been provided.

D. B. MEEK,

Director of Industries, Bengal.

The 25th June 1924.

↳ JALPAIGURI DIVISION.

Districts—Jalpaiguri, Rajshahi, Darjeeling, Dinajpur, Bogra
Malda, Pabna and Rangpur.

Brass and bell-metal industry.

RAJSHAHI DISTRICT.

Nator subdivision, Kanaiakhali and Paluapara Villages.—About 16 men of the Bairagi class are engaged in the making of bell-metal spoons of different shapes and sizes. Old bell-metal wares to the

extent of about 52 to 53 maunds are used as raw materials, the approximate value of which comes to Rs. 2,700 per year. The quality of the articles produced is fine and they are well finished and are much appreciated by the public. The weight of the finished product is about 50 maunds per year; the approximate value of which is Rs. 10,000.

The old wares are melted in a number of crucibles specially made. Charcoal, produced locally, is used as fuel. The requisite quantity of metal for the making of a spoon is put in a crucible and a number of such crucibles are arranged in the furnace for melting. The solid mass from the moulds is then beaten out, filed, scraped and finally polished by hand.

The tools used are very simple, such as hammers, anvils, files, forceps and scraping tools. They require very little repairs. Special tools are made locally out of old files.

At the end of 1921 these workers were organised and a co-operative society was started. The society got a loan of Rs. 400 from the Nator Central Bank with the help of which they have been able to get out of the clutches of the *mahajans*. Before the formation of a co-operative society a worker used to earn about Rs. 20 per month, but his present income comes to about Rs. 25. The workers could still more increase their income, if they devoted more energy to their work.

These brass workers get the supply of their raw materials from local dealers. The finished product is disposed of to the local bell-metal and brass-ware dealers and also to private customers. Sometimes these wares are supplied to the Co-operative Stores of Dacre's Lane, Calcutta, according to the orders they receive. The workers have no other occupation.

Budhpara Village.—The brass and bell-metal industry of Budhpara is carried on on an extensive scale. There are about 42 workshops and quite a number of men are engaged in this industry.

Raw materials are supplied by the *mahajans* who receive the old wares partly from *beparies* and partly from Calcutta. The people here do not make new alloys but use old wares as their raw material. The total quantity of raw material consumed in a year is about 1,730 maunds. The approximate value of which comes to Rs. 76,000. The raw materials consist of 1,250 maunds of bell-metal, 420 maunds of brass, 33 maunds of bharan and 27 maunds of zinc.

Bell-metal *thalas* (big plates) and cups, bharan tumblers, and brass pitchers, big pots (*handis*), pans, etc., of different shapes and sizes are made.

PROCESS OF MANUFACTURE.

Bell-metal.—Old wares are broken to pieces and put in crucibles which are made locally. A crucible is used only once. It is placed in a furnace and heated by charcoal firing for about 5 or 6 hours when the materials melt and are sufficiently liquid. The crucible is taken off the furnace and a hole is punctured on its side and the molten mass is poured into a series of small earthen pots smeared with oil. A little salt and borax powder is sprinkled over the molten mass before being poured into the small earthen pots to form ingots. It is reported that this is done to clarify the metal. The ingots is called

khuti. The *khuties* are heated and beaten out. Bell-metal cannot be beaten out unless it is hot, so the process of heating and beating out is carried on several times until it is given a definite shape. The beating out of the material is very laborious and requires the services of six men at a time. One holds and manipulates the metal piece (*khuti*) on the anvil and 5 men hammer alternatively. If a man or two of this gang of hammerers remain absent from work the others have in consequence to remain idle. The final shaping of the material is done by light hammering.

After the metal wares have thus been beaten out the articles are scraped with sharp tools made from old files. The final scraping and polishing are done on country lathes.

Bell-metal is extremely brittle and it requires careful handling as any crack or breakage cannot be mended unless it is melted again. All wares are done in one piece as the metal cannot be welded together. The wastage in the course of manufacture is from 3 to 5 per cent.

Brass.—The process of manufacture is nearly the same as that of bell-metal. Zinc $6\frac{1}{2}$ per cent. by weight is mixed with old brass ware before melting and it requires about 12 hours' heating in the furnace. In most cases several nuggets are beaten out, made into different shapes and then welded together. This metal is easier to handle as holes or breakages can easily be mended. The brass articles are cleaned and polished on a lathe. The wastage of this metal in the course of manufacture is 6 to 8 per cent.

Bharan.—This is a metal which is neither bell-metal nor brass but is a mixture of both. The articles manufactured consist chiefly of cups and tumblers. The articles are made by casting in moulds. They are then scraped and polished on a lathe. A crucible is used for a single casting. A number of such crucibles, with the requisite quantity of raw materials in them, are placed in the furnace and the metal contained in each crucible is just sufficient for a single casting.

SYSTEM OF ORGANISATION.

All workshop owners, with the exception of 6 or 7, are in the clutches of the local *mahajans*, and have to depend on them for the supply of their raw materials and for the sale of the finished goods. The workshop owners are compelled to receive big advances from the *mahajans* in addition to the supply of raw materials as they are required to pay the salaries of their workmen in advance, without which labourers for this purpose are not available. The *mahajans* supply raw materials and receive the finished goods in return after paying the cost of production called *bani*, the rates of which depend upon the quality of the articles produced. It is said that the workshop owners who are the experts are worse off than the daily or monthly wage earners. The *mahajans* themselves get fairly good profit on the capital they invest. Their profit comes to about 12 to 15 per cent. The collection and disposal of the raw materials, the selection of new designs, etc., and the final disposal of the finished products are all organised and managed by the *mahajans*. Reports show that the number of workers is decreasing, the reason being that the rate of *bani* or wages has not increased in proportion to the increased cost of production as well as the cost of living.

The profits they now make though much increased are hardly sufficient to allow them to live as they did before. These economic, strained conditions are prevalent everywhere.

The workshop owners are not responsible for any thing else but to find suitable labour, and to manufacture the articles while the *mahajans* have to do everything else. These *mahajans* dispose of their goods to shop-keepers, *beparies* and also export them to other places, sometime for cash and sometime on credit. They also collect old wares through the same sources.

The industry was at one time entirely in the hands of Kansaries but subsequently the Kaivartas and Muhammadans also took up the business as it was found to be very profitable.

The workshop owners experience great difficulty in procuring workmen particularly for the beating out of the metal which is very hard work and one cannot possibly do it continuously for days together without at least a day's rest after every 3 or 4 days.

The total yearly production at Budhpara is about 1,200 maunds of bell-metal wares, 400 maunds brass wares and 30 maunds bharan wares, the approximate value of which is Rs. 2,00,000.

Kalam Village.—There are nearly 44 workshops and about 160 men engaged in brass and bell-metal industry. The men are mostly Kansaries and Muhammadans who have no other occupation.

The raw materials consumed yearly amount to about 800 maunds old bell-metal wares, 870 maunds old brass wares, 50 maunds zinc and 52 maunds old bharan, the value of which would be about Rs. 60,000.

Thalas, cups, tumblers, pitchers, pans and *handies* of different shapes and sizes are made at the above village.

The total yearly outturn is 750 maunds bell-metal wares, 850 maunds brass wares and 50 maunds bharan wares—the approximate value of which comes to Rs. 1,80,000.

The process of manufacture and the organisation for the disposal of the finished products are similar to those described under village Budhpara. The workers here, however, seem to be more in debt to the *mahajans* and their condition is worse. Many of the workers, having been deprived of their property are reported to have fled from the villages.

ABSTRACT.

The total yearly production of brass and bell-metal wares in the district of Rajshahi is nearly 3,330 maunds, the value of which comes to about Rs. 3,50,000 to Rs. 4,00,000.

Matka weaving industry.

The yarn produced from pierced cocoons is called *matka*. The spinning of yarn is done by women with *takku*. At present practically speaking the whole of the yarn consumed in the district of Rajshahi comes from the district of Malda. The yarn received by the weavers is first bleached with soda or *shaji* and the ash of banana plant. By beaching, the yarn loses about 33 per cent. of the weight. It is then sized with *khas* starch, made into warps and woven on very primitive looms.

There are only 8 villages in the Sadar subdivision where *matka* weaving is carried on. The weavers are Tantis by caste.

Names of villages.	No. of looms.
(1) Dakra Raipur	9
(2) Chandan Sahar	16
(3) Hajrahatti	10
(4) Bharatipara	4
(5) Nandangachi	2
(6) Palashi	3
(7) Panikumra	13
(8) Keugachi	7
	64

There are in all 50 families with 64 looms in the district.

The looms are of the throw pattern and are chiefly made from the tar palm wood. Good carpenters are not available for making looms. Expert from the district of Pabna visit these villages to supply reeds or to repair them for the weavers.

The raw yarn consumed yearly in the district is about 50 maunds and its approximate value is Rs.- 28,000. Yarn made in this district is about a maund per year. The art of *matka* yarn spinning in this district is practically dead as pierced cocoons are not available. At one time the *matka* yarn in this district was considered to be of excellent quality but now it is with difficulty that the yarn is obtained.

Matka chadars, thans of 10 yards in length, and *dhutis* and *saris* with red silk borders are made from these yarns. On an average 1,500 pairs are produced annually, the value of which is about Rs. 45,000.

SYSTEM OF ORGANISATION.

The yarn dealers of Malda visit the above villages and sell the yarn to the weavers usually on credit. The weavers dispose of their finished product mostly to the agents employed by big dealers called *mahajans* for cash. Sometimes they receive *dadans* as well. The *mahajans*, after collection, sell the goods in the local markets of Rajshahi and also export some quantity to Calcutta. In pre-war days a large quantity of *matka* cloth used to be exported to the Punjab and other places but this business is practically stopped due to the abnormal rise in the price of these goods. For example, a pair of cloth which used to cost only Rs. 9 to Rs. 10 has gone up to Rs. 22 to Rs. 24. Necessarily there is no demand for them now. The weavers are as a rule idle, and are not inclined to work to their full capacity and have a tendency to make more profit by doing less work. If an order is placed with them they do not keep up to the standard and the goods are seldom delivered in time. The average income of a weaver is Rs. 20 to Rs. 23 per month. These weavers could easily increase their income by about Rs. 5 to Rs. 7 per month if they would work to their full capacity.

Blanket-making industry.

Keshabpur-Veripara Village.—There is only one village where blankets are made in the district. About 12 to 15 families are engaged. They are upcountry men settled here for a long time and are Garoli (Veriwala) by caste. The female members with the help of children do the spinning of yarn and the male members do the weaving, washing and milling. Everything is done by hand. Raw material, *i.e.*, sheep's wool, is imported from Bhagalpur, Calcutta and other places and the price ranges from Rs. 40 to Rs. 65 per maund as reported by the people themselves. Most of these people have a secondary occupation, mainly service. Wastage of wool during the course of manufacture including dust, etc., comes to about 35 to 40 per cent. Long pieces in small width of about 22" are woven. No looms are used. Several pieces are then stitched together. Finally the blankets are finished by washing with water and treadling at the same time to loosen the wool in order to make the article appear like a compact woven sheet. The prices of blankets vary from Rs. 4 to Rs. 12 a piece. About 500 pieces are made yearly. The average earning by this pursuit comes to about annas 4 only per head per day. The profit being very small, most of the people do this work in their spare time, *i.e.*, whenever they are off from their other duties. The weavers do not find much difficulty in selling these goods in winter. Some are sold locally and the rest are purchased by blanket dealers who come to the places in winter. The weavers make blankets throughout the year but they experience great difficulty in storing their goods during the damp hot season when the blankets and wool are very much affected by insects. The use of dried Nim leaves in the folds of blankets has been suggested for storing. Nim leaves have a great germicidal effect and cost nothing.

Cotton weaving industry.

Naogaon subdivision, Dokachi Village.—There are about 37 to 40 families engaged in cotton weaving with about 26 fly-shuttle pit looms and about 20 country looms. These people get looms from Kusthea and from a loom-maker of Santahar. Cultivation is the primary occupation of most of them. They produce *gamcha*, *dhuti*, *lungi*, and mosquito curtain pieces. They get their yarn from local markets and *hâts*. The sizing and warping is done in the usual country way. The yarns used are from 16 to 32 counts. On an average a loom is worked only 6 months. About 7,000 lbs. of yarn is consumed in a year. Usually the weavers dispose of their finished goods in the local *hâts*. The people are giving up using throw-shuttle looms and are taking to fly-shuttle pit looms with roller shuttles.

Ilshabari Village.—There are in all about 15 families with 15 country looms (small) used by men of advanced age, all of whom are fairly well off but cultivation is their main occupation. The weavers of this village formed themselves into a co-operative society. The supply of yarn and the disposal of finished goods are managed by the Co-operative Sale and Supply Society of Naogaon. The yearly consumption of yarn of 16 to 32 counts is about 2,800 lbs.

Bilkristopur Village.—There are about 28 families with 10 fly-shuttle and 20 country looms. Cultivation is the primary occupation of these

workers. The yarn consumed is about 3,000 lbs. yearly and the counts of yarn are 20's to 40's. Fourteen persons of this village are members of the co-operative society. The members have the benefit of the supply of yarns and the disposal of their finished product from the Co-operative Sale and Supply Society of Naogaon. The non-members manage their affairs like the people of Dokachi village.

Lohachar Village.—There are about 12 families with 7 fly-shuttle and 10 country looms. Cultivation is the primary occupation of most of them. The yarn consumed yearly is about 2,200 lbs. of 16's to 40's. The supply and disposal of the finished goods is done through *mahajans*.

Rajapur Village.—There are about 32 families with 30 fly-shuttle and 6 country looms. Cultivation is a secondary occupation and is followed by the majority of these people. The yarn consumed yearly is about 8,000 lbs. of 20's to 50's. About 25 persons have joined the co-operative society of the village. The means for the supply of yarn and the disposal of the finished goods are similar to those of the village Bilkristopur.

Raninagar Pubpara Village.—There are about 18 families with 20 fly-shuttle looms. Cultivation is a secondary occupation for most of the people. About 4,500 lbs. of yarn 20's to 40's are consumed yearly. The co-operative society of 18 members has gone into liquidation. The supply of yarn and the disposal of finished goods used to be conducted by the Co-operative Sale and Supply Society of Naogaon.

Raninagar Paschimpara Village.—There are about 36 families with 27 fly-shuttle and 10 country looms in the village. Cultivation is the secondary occupation of most of the weavers. About 9,000 lbs. of yarn from 20's to 40's are consumed annually. The co-operative society, consisting of 35 members, has gone into liquidation. The members of this village also used to get the benefit of the supply of yarns and the sale of finished goods through the Co-operative Sale and Supply Society of Naogaon.

ABSTRACT.

Abstract of villages Dokachi, Ilshabari, Bilkristopur, Lohachar, Rajapur and Raninagar (Naogaon Subdivision).

Families—180.

Fly-shuttle looms—120.

Country looms—80.

Quantity of yarn per year—36,500 lbs.

Counts usually used—16's to 50's.

Cotton weaving is carried on in many of the small villages and the weavers are scattered throughout the district and no reliable data can be had of them.

The weavers, however, have realised the advantage of fly-shuttle looms and the number of them is increasing daily. A weaver's income comes to about Rs. 25 a month. The Inspector of Industrial Co-operative Society, who is stationed at Naogaon, is also a weaving expert and gives instruction to the local weavers who are members of the society

in the making of new patterns and designs. The weavers of the above villages are all Muhammadans. The approximate value of raw materials comes to Rs. 50,000 and that of the finished product would be Rs. 80,000 per year.

Tanning and shoe making.

Sadar subdivision, Shipaipara Village.—Three or four persons out of 35 of the same class are engaged in the art of tanning. These people are up-country men, who have settled here for generations, and are Moochi by caste.

Cow and buffalo hides are generally used for tanning and both raw and dried hides are used. Only one side at a time is done by each individual, as the earthen pots used for steeping purposes are small.

The goods are soaked in pure water and cleaned. Lime paste is then applied on the flesh side and left overnight. The hides are put into the lime pot and handled every day. Liming goes on for about 20 days. The hides are unhaired and soaked in water for some time and then fleshed. Unhairing is done by means of a country butcher's small knife while the side is spread on a flat piece of wooden plank. Fleshing is done with the aid of a broad *khurpi*. The goods are then washed and put in fresh tan liquor composed of pounded myrobalan only. After 3 or 4 days fresh tan liquor is made and the goods are steeped in this for 5 or 6 days and tanning finished by the bag method. In a bag they put chopped parasite plants, which grow on mango trees. When thoroughly tanned the goods are washed and dried. Cow hides are generally tanned and coloured black by iron sulphate for manufacture of boot uppers. For tanning, sometimes calf skin is used and both tanning and shoe making are done by one man who tans the leather for his own consumption. The methods are very crude and much material is usually wasted. The outturn is extremely small and a man can earn by this industry about Rs. 15 to Rs. 20 only per month.

Nator subdivision, Lalpur Village.—There are 15 persons engaged in this industry.

Here the process of tanning is almost identical with the one described as adopted in the abovementioned village, Shipaipara, with the exception that the workers of this locality do not tan their goods by the bag method, consequently the leather produced is under-tanned, and much inferior in quality. The villagers overcome this undertanning by applying a solution of *khari* salt to the flesh side of their half-tanned leather. By virtue of its capacity for retaining a considerable quantity of moisture the hide remains soft but only temporarily; so shoes made from such leather become in the course of use very hard and shapeless when this artificial application of salt is washed off. The villagers use their production of leather for the making of shoes. They manufacture leather to a limited extent but the whole production is negligible as they also import leather from Calcutta. The total outturn of shoes is nearly 1,800 pairs per year. These goods are disposed of locally. If there be an accumulation of goods the villagers take the articles to Nator where they are sold. Bristle stitching is not used.

The industry is not centralised and is difficult to localise.

Note on brass and bell-metal industry.

This may be considered as the most important of all the existing industries of the district. It is being carried on in 3 centres—at Kanaikhali, Budhpara and Kalam, as well as in other adjoining villages of the subdivision of Nator. The number of actual workers in the industry (other than the persons engaged in the organisation of supply) is nearly 350. The total quantity of raw materials consumed is about 3,555 maunds costing about Rs. 1,38,700 per year.

The total yearly production of finished goods is approximately 3,330 maunds, the value of which varies from Rs. 3,50,000 to Rs. 4,00,000.

The condition of the brass and bell-metal workers of the above villages except Kanaikhali is complicated. The industry is entirely in the hands of *mahajans* who control both the supply of raw materials and the sale of finished goods. Workshop owners are as a rule heavily involved in debt to these *mahajans* who are as important to the industry as the real workers. The *mahajans* make a profit of 12 to 15 per cent. on the total amount of money they invest. Such a profit cannot be considered high when the great risks to which they are exposed under the existing system of business are considered and it is doubtful if the business could be carried on without their help. Workers under present circumstances cannot possibly get the benefits of co-operative organisation. It may be presumed that persons having liabilities many times greater than their assets will undoubtedly be considered as undesirable prospective members for any co-operative society for they will never be granted credit from any co-operative bank, and will not get loans without suitable securities even if they were members of co-operative societies. So the formation of co-operative societies by these industrialists is not found to be feasible unless Government comes forward and risks a large sum of money at the commencement.

It has already been pointed out in the body of the report that the average income of workshop owners are not commensurate with the increased cost of living and that their capacity for work has been much diminished, due to ill-health and insufficient food. They have no savings to better their condition. The *mahajans* at the same time cannot possibly increase their rates of *bani* for the benefit of workshop owners without increasing the prices of finished goods which eventually would decrease sales. It has also been pointed out that much difficulty is being experienced in securing workers for hard manual toil as hammerers. It has thus become necessary to introduce labour-saving machinery, which may decrease the cost of manufacture and solve the problem of recruitment of labourers and any decrease in the cost of manufacture will be beneficial to the real workers. It may for the present be suggested to introduce mechanical hammers driven by oil engines. But before it is finally recommended experiments should be conducted to test mechanical hammers being suitable for this purpose.

Action is being taken to conduct this experiment which, if found successful, may either induce the workers to instal such machines, or induce Government to undertake such installation and carry on the work till the workers are able to purchase the whole plant themselves.

The general economic condition of the real workers of Kalam and Budhpara is rather deplorable. The daily wage earners are better off

than the real experts, who by virtue of their ignorance of other handicrafts stick to this work. Their business does not appear to be paying in view of the hard work they do. It is indeed true that the number of workers is decreasing, the primary reason being that the rate of *bani* did not increase in the same proportion as the cost of living increased. Necessarily want is experienced and this strained economic condition is prevalent everywhere. Those who do independent work are much better off.

Note on matka weaving industry.

Matka weaving is carried on in 8 villages within the jurisdiction of Sadar subdivision. In all about 50 families with 64 country looms are engaged in the business. Yarn to the extent of about 2,000 seers is imported from the district of Malda and the approximate value of the annual outturn is Rs. 45,000.

Big dealers collect the goods either for cash or on the *dadan* system and conduct sales in the local market of Rajshahi, and also export to Calcutta. The business has much declined due to the closure of the Punjab market. In pre-war days a large quantity of cheap *matka* cloth was exported to the Punjab when the cost was 50 per cent. less than the present rate. The weavers are of opinion that fly-shuttle looms are not suitable for their purposes, unless twisted yarn is used. Mention is made concerning the same industry in the district of Malda that several fly-shuttle looms are being worked in the village of Jyot but the outturn does not appear promising.

The income of a weaver, not dependent on *mahajans*, is about Rs. 21 a month. The weavers are as a rule lazy and do not care to work up to their full capacity. They could easily increase their income by about 25 per cent. were they to work up to their full capacity.

The difficulty of organisation of co-operative societies lies in the fact that in no single village, could the requisite number of weavers absolutely necessary, be found. However, attempts may be made to get the required number by writing to the weavers of two or more neighbouring villages.

Note on blanket weaving industry.

Blanket making is carried on in one place only. Blanket makers number about 15 and their yearly outturn is only 500 pieces, the prices of which vary from Rs. 4 to Rs. 12 per piece. The blanket makers do the work during their spare time while their women members spin. It is reported that they find difficulty in disposing of their finished product and in procuring raw materials. Attempts are being made to organise a co-operative society which, if successful, will help in the purchase of raw materials jointly, but difficulty arises in getting a sufficiency of workers required for co-operative organisation.

Attempts may also be made to introduce simple machines like those of the Kalimpong type for spinning wool, if these machines prove suitable for the kind of wool used.

Note on cotton weaving industry.

Cotton weaving is not expensive in the district. There are some villages in the subdivision of Naogaon where cotton weaving is done on an organised basis. Nearly 200 looms are at work in the district in addition to stray looms of which no account could be taken. Fly-shuttle looms are mostly used. The approximate value of the product of the looms is about Rs. 80,000 per year. It may be safely stated that fly-shuttle hand looms are gradually taking place of old country looms, and the people are convinced of the advantage of better type looms. Wheel shuttles are also being taken up. There is a Co-operative Supply and Sale Society at Naogaon which supplies yarn to the members on credit and disposes of their finished product.

A peripatetic weaving instructor may be appointed to move about amongst the people to instruct persons other than the members of the co-operative societies on the working out of new designs and patterns.

The cotton weavers' condition seems to be fairly good, and an average income is earned of about Rs. 25 per head per month during the working season. Most of these people cultivate in addition to weaving.

It may be noted here that the price of yarn at the Naogaon Co-operative Sale and Supply Society is slightly higher than the prevailing local market rates. There is no remedy for this evil unless the society be conducted by the workers themselves, but this does not appear to be feasible as a sufficient number of literate workers is not available. In some places it is difficult to get even a single literate person to act as secretary to the society.

Note on tanning and shoe-making industry.

The industry is very limited and is carried on by a group of men in one place. Unless it be more centralised there can be very little scope for its improvement. The people have practically no savings by which they can make better arrangements or purchase those new appliances which are absolutely necessary to effect improvements. Moreover, in no single village or a group of neighbouring villages is a sufficient number of workers available for successful co-operative organisation. With regard to tanning, no improvement seems to be possible unless the work is organised on the system of the small scale factory. This no individual worker seems to be able to do, even if he be a member of a co-operative society. If an organisation of a Chamars' co-operative society be found possible, all the members should combine together to start a small factory by joint loan or contribution. The members must work jointly and each of the workers should be paid wages on a piece-work basis. The profits may be distributed equally amongst the members. This may be considered as the only way by which an improved method of tanning may be introduced with efficient control of work; but great difficulty will arise in inducing people to work under such a system. In respect of the shoe-making industry, the question is a different one, as a single individual may have a self-contained shop. Members of the industry should combine together to acquire a sewing machine for stitching uppers. These two industries have been dealt with together in view of the fact that the workers mentioned in the report do both tanning and shoe-making in the same place.

RANGPUR DISTRICT,

Satrancha weaving industry.

Rangpur Sadar subdivision.—*Satrancha* weaving is carried on in the four following villages commonly known as Nesbatganj:—

In Parbatipur village.—5 men are engaged in the work. About 900 lbs. of yarn of 8's to 10's are consumed per year and the value of the finished product is about Rs. 1,200.

In Pirijabad village.—16 men are engaged in the work. 2,700 lbs. of yarn are consumed yearly and the value of the finished product is about Rs. 3,700.

In Damodarpur village.—10 men are engaged. The yearly consumption of yarn is about 1,800 lbs. and the value of the outturn is Rs. 2,400.

In Barabari village.—6 men are engaged. The yearly consumption of yarn is about 1,100 lbs. and the value of the outturn is nearly Rs. 1,500.

Neither loom nor reed is used, and the warp is worked by healds only. Two or three or more men work at the same time. The weft is worked out by hand after the type of solid border weaving, and is finally placed in position by beating with iron comb. When the work with a single weft is finished by all the workers on the same piece, a heald is raised and another weft is worked out and so on. This is a very slow process and 2 men working the whole day can only finish a piece of *satrancha* 7' 6" by 4' 6" in three days. The average earning per head per day by this work is from 4 to 5 annas only. Yarn of 10 counts is used for warp and 8 to 9 counts for weft. Yarn is procured from the local markets. *Satrancha* is generally made according to size and quality as ordered by the dealers. Designs are worked out by yarn of three main colours, deep blue, light blue, and red. Grey yarn is used only for warp and coloured yarn for weft. The dyeing of yarn is done by the workers. Deep and light blue yarn is coloured indigo and red by synthetic dyes purchased from the bazar. It is interesting to note that these people cultivate indigo plants on their own land. Indigo for their own purposes is made by ordinary methods of steeping, fermentation and churning for oxidation. The indigo is preserved in paste form, and used as required.

The dyeing of yarn is done by a mixture of banana plant, ash, lime, *gur* and indigo. During the war time the work of this industry was practically stopped for want of yarn but the work is again being gradually taken up. The main occupation of the Muhammadan workers is cultivation.

The total number of men employed in this industry is from 35 to 40. The annual consumption of yarn comes to about 6,500 lbs. and the approximate value of the outturn is Rs. 9,000.

All weavers are Muhammadans and cultivation is their main occupation.

Cotton weaving industry.

Kurigram subdivision, Patilapur village.—In the village there are nearly 50 families having 33 country looms. All are Muhammadans and

most have cultivation as a secondary occupation. Both coloured and grey yarn of 16 to 40 counts are procured mostly from Calcutta and Kushtia by an influential person of the village, and sold to the weavers, but sometimes yarn is got from Ulipur as well. *Lungis* and *dhutis* in small quantity but principally *gamchas* (napkins) are made. The total quantity of yarn consumed is about 7,000 lbs. per year and the produce is sold in Ulipur and Thetrai *hâts*. Occasionally cloth dealers come to the village and collect the goods by house to house visitation. No estimate could be made of the value of goods produced.

Khamarkishorpur village.—Only 5 to 6 families with 6 country pit looms are engaged in cotton weaving. They get yarn from Ulipur and about 1,300 lbs. of yarn are consumed yearly. Other conditions are similar to those of Patilapur village described above.

Nilphamari subdivision, Dimla.—There are only 2 families with 3 country looms in the village. *Lungis*, commonly known as *fotas*, are made of coloured and grey yarn.

Stray looms are found in villages here and there but no account of those could be made.

Attempts are being made to demonstrate weaving with shuttle looms for the benefit of Patilapur and Khamarkishorpur weavers.

Cigar-making industry.

Sadar subdivision, Chengamari village.—Tamizuddin Sarkar of the above village has learnt this art under the guidance of demonstrators deputed by the Department of Agriculture, whose aim is to introduce cigar-making as a home industry and all his family members participate in the work. His production is about 1,500 cigars per week and these are disposed of locally.

Nirlakchandi village.—Rajkristo Mahanta of the above village has learnt this art under the guidance of demonstrators deputed by the Department of Agriculture whose aim is to organise cigar-making as a home industry and all his family members participate in the work. He produces about 1,500 cigars per week which are disposed of locally.

Jute spinning and chat-making industry.

The industry is being carried on by a large number of persons, mostly women, members of the cultivators families, in the subdivision of Nilphamari. It is so very scattered and isolated that no regular survey of such an industry was found practicable. A few neighbouring houses in the villages of Goybari and Nadabesh were found where jute spinning and chat weaving were carried on. Practically speaking no elaborate appliances are required for the purpose. No reed or loom is used and the warp is worked out by healds. Workers fit up their small appliances outside their houses and the whole contrivance is taken inside the house when not required. When no work is being done one can scarcely find any trace of the industry in the house. These *chats* are used as a substitute for blankets both for the purpose of spreading and covering. The business is brisker during winter. Rough statistics are collected from the principal marts of these goods and the goods are mostly sold in the *hâts* of Boragari, Sathibari and Nautara, their number

would be from 15,000 to 20,000 pieces and their value comes up to Rs. 18,000 to Rs. 25,000. *Chats* of very fine texture are also available but are not made unless ordered. Ordinary *chats*, the prices of which range from Re. 1 to Rs. 1-8 per piece, are usually made and generally available. The villagers purchase raw materials either in the shape of spun or raw jute and sell their finished product in the local *hâts*.

Arrangements are being made for the demonstration of improved methods of jute spinning and weaving at Boragari and Nautara.

N. B.—As the report is a self-contained one no separate note is attached.

Ivory and horn works.

Kurigram subdivision, Panga village.—The art of ivory working at Panchgram Khandikarpara (Panga) is practically dead. At one time there were about 16 or 17 persons engaged in ivory, horn and wood work. They used to be mainly supported by rich people for whom they did fancy work with ivory. The main production used to be done at rich men's houses on the monthly wage system and tusks were supplied to the workers but now for want of such support and encouragement the art is lost. Expert workers are now all dead and young men have not taken up the work for support and tusks are not available. At present 3 persons work with wood, and buffalo and deer horns. They make mostly *kharam* (wooden sandals studded with horn pieces), horn bangles and *bowlas* for a couple of months or so then dispose of the produce in the *melas*. Their main occupation is now cultivation and no good ivory articles could be found in their houses even for samples. Hardly any thing could be suggested for the improvement of this art which is now almost dead.

N. B.—No separate note is attached as the report is a self-contained one.

Shoe-making industry.

Rangpur town.—About 50 shoe-makers are engaged in this place and manufacture footwear. They come from the Arrah district and live with their families and turn out about 20 pairs of shoes a day, *i.e.*, about 7,000 pairs per year. Leather is got from Calcutta. Both vegetable and chrome-tanned leathers are used for uppers and Julundhar buffalo leather for soles. One worker has a sewing machine and does stitching of uppers and charges on the piece-work system. Most of these people go back to their homes in the early part of the rains and come back again in the beginning of summer. They know their business pretty well.

The only thing that could be suggested for improvement is to create facilities for the supply of raw materials. Co-operative organisation is not feasible as the members are not local people. No account could be taken of solitary shoe-makers.

N. B.—As the report is self-contained no separate note is attached.

Note on Satrancha weaving industry.

The industry is carried on only in 4 villages commonly known as Nesbatgunj. The total number of persons engaged is about 35 to 40 and the value of the finished product is about Rs. 9,000. The industry was

practically closed during the war. The workers are all Muhammadans and cultivation is their main occupation. Their economic condition appears to be good. The industry is very limited. Goods are prepared according to orders received from dealers but there is not so much demand for this stuff in view of the abnormal rise in prices. It is reported that cheaper fabrics from other provinces are displacing the local product. In order to give impetus to this industry suitable markets should be found. Hardly anything else could be suggested for the improvement of this industry.

Note on cotton weaving industry.

The industry is worked on a very limited scale in this district. It is being carried on in partially concentrated form in two villages within the jurisdiction of Kurigram subdivision. The looms operated are of the limited number of 40, all of which are old pattern country looms. There are solitary looms here and there in the district, but no account of them could be taken. A peripatetic weaving instructor may be deputed to those places to teach the use of fly-shuttle looms. Attempts may also be made to spread hand-loom weaving with fly-shuttle looms.

Note on the cigar-making industry.

The industry is only in its infancy and the products are far from being satisfactory. Unless a central organisation is formed with proper arrangements for grading and aging cigars after they are collected from the rollers, there is very little hope of improvement in the quality of cigars. The central organisation will have to arrange for sale as well. If the proposed cigar factory comes into existence it may be in a position to act as the central organisation.

It may be mentioned here that cigars are made to a great extent at the Burirhat Agricultural Farm and the North Bengal Agricultural Development Co., Ltd., in the district.

MALDA DISTRICT.

Brass and bell-metal industry.

English bazar.—*Brass.*—There are about 20 men engaged in this industry all of whom are Kansaries (Hindus). Raw material is imported, brass sheet and the amount consumed is about 110 maunds valued Rs. 8,000. The only articles manufactured are *lotas*, known as Saidullapur *lotas*, which are much liked. Nearly 100 maunds of finished *lotas* are made annually, the approximate value of which is Rs. 11,000. The local *mahajans* advance the raw materials, and receive the finished goods, paying *bani* (cost of production for them). These people in addition to this manufacture do a good deal of repairing old wares. This industry was practically closed during the war when sheet metal was not available.

There is another class of brass workers who come from Bonpas, of the district of Bhagalpur, and work for 7 months in a year from November to May. They are about 12 in number and Karmakar by caste. They produce also brass *lotas* by casting in moulds. The *lotas* are finally filed

and cleaned. The raw material used is about 80 maunds of old wares and the value of which would be nearly Rs. 2,000. The quantity of *lotas* produced would be about 75 maunds, worth nearly Rs. 3,500. In this case also the *mahajans* play a similar part.

Kasharipara village (Nawabgunj).—Bell-metal.—There are 21 workshops and about 200 persons engaged in this work, of whom 36 are engaged in hammering. Some of these 36 men have secondary occupations such as paddy harvesting, and mango business during the mango season. Others have no other secondary occupation. There are about 180 Hindu and 20 Muhammadan workers in the village.

Raw materials are supplied by the *mahajans* who get the supply partly from their *beparies* and partly from Calcutta and the greater portion of the raw material consists of old wares. When there is any scarcity of old wares the people here make an alloy from a mixture of 5 parts copper and 2 parts tin, which metal the *mahajans* get from Calcutta. It is estimated that about 100 maunds of new alloy is made, out of a production of about 2,300 maunds. The quantity of raw material required for this place would be about 2,500 maunds valued about Rs. 1,25,000.

Only *thalas* (big plates) of different shapes and sizes are made.

The process of manufacture is similar to that described under the brass and bell-metal industry of Budhpara village, Nator subdivision, Rajshahi district (*vide* page 67 of this report), with the difference that the goods are delivered to *mahajans* without working on a lathe, *i.e.*, before the final scraping and polishing. There are about 40 lathe workers in the village of Bilpara, who exclusively do the work of final scraping and polishing of *thalas* received from *mahajans* direct.

Tools.—Ordinary forge, hammer, anvils, forceps of different shapes and sizes, files, chisels and scrapers, etc., all are very simple, and require few repairs which if necessary are done locally. Small tools for scraping and chiselling are made locally from old files.

About 2,300 maunds of finished goods are yearly manufactured, the approximate value of which would be Rs. 2,40,000.

General organisation and labour system.—All shop owners are deeply involved in debt to the *mahajans*, and from them they get their supply of raw materials. The shop owners make advances to their workmen. A band of hammerers (6 men) works alternately in 4 shops. As some of those hammerers go out during paddy harvesting time, and are engaged in the mango business during the mango season, and as sufficient fresh labourers are not available to replace those who leave (owing to the extremely hard nature of the work) the workshop owners are experiencing great difficulty in recruitment of hammerers and the business suffers considerably.

Brass.—There is only one workshop dealing with brass wares. Two men are engaged in the industry. The production is about 50 maunds a year valued about Rs. 2,500. They make *kalsi* (pitcher), *karai* (pan) and *handi* (boiling pot). The cost of raw material would be about Rs. 1,200. Pitcher tops are made by casting, then by beating into shape.

Majpara Sankarwati village (Nawabgunj).—Bell-metal.—There are only 3 workshops in which 8 men are engaged. Cups of different shapes and sizes and qualities are manufactured. System and organisation of work are similar to those of Kasharipara village, with the difference that as a rule monthly wage labour is not employed but the system of exchange of labour is in vogue (*i.e.*, if a man requires the service of 5 men

for a day at a time he gets his work done by having a loan of labour of 5 other workers and he returns the labour by working a day to each of them. This system is called *gata*). Goods are delivered to *mahajans* in the perfectly finished condition. Only old wares are used as raw materials and no new alloy is made. Raw material required is about 60 maunds yearly, valued at nearly Rs. 2,400. About 54 maunds of finished goods are produced, the approximate value of which would be Rs. 6,000 per year. The workers are all Muhammadans.

Brass.—About 100 men are engaged in 40 workshops making *kalsi*, spoon, *pān-diva*, etc. All are Muhammadans.

Raw materials, organisation and system are similar to those under "bell-metal" of the same village and the *gata* system of labour is prevalent.

About 2,400 maunds of old brass wares and about 140 maunds of zinc at a cost of about Rs. 57,000 are consumed as raw materials per year.

The quantity of finished product is about 2,250 maunds, the approximate value of which is Rs. 1,12,500.

Bilpara village (Nawabgunj).—*Bell-metal*.—There are 16 shops with 27 workers who are all Muhammadans. They manufacture cups of different shapes, sizes and qualities. System of work, organisation and labour are similar to the system of Majpara Sankarbati villages. No new alloy is made. The quantity of raw materials used is about 275 maunds of old wares the cost of which would be about Rs. 13,750 per year. The quantity of finished product is about 250 maunds the approximate value is Rs. 30,000 per year.

Brass.—There are about 20 workshops with about 67 workers who are all Muhammadans. They manufacture *lotas* and *kalsis* (pitchers small and big). System of work, organisation and labour are the same as under "bell-metal" of the same village. The *gata* labour system is prevalent. *Lota* tops are made of bharan by casting in moulds. The quantity of raw materials used is about 1,800 maunds of broken wares, and 100 maunds of zinc, valued at about Rs. 47,500. The quantity of finished product is about 1,650 maunds, the approximate value of which is Rs. 82,500.

There are about 20 lathe works in this village as mentioned under "bell-metal" of Kasharipara. Forty men are engaged in the work of final scraping and polishing of *thalas* manufactured in the village of Kasharipara (Nawabgunj). *The total production of the villages of Kasharipara, Majpara, Sankarbati and Bilpara which are close to each other, is roughly 2,600 maunds of bell-metal wares, which cost about Rs. 2,80,000 and 3,900 maunds of brass wares, which cost about Rs. 2,00,000.*

The number of men employed is 450 of whom 270 are Muhammadans, and about 2 per cent. of these men have secondary occupations, such as cultivation, paddy harvesting and mango business during the season.

Organisation of sale.—There are 6 big and 8 ordinary *mahajans* in Nawabganj town, who advance the workers money and raw materials, and receive finished goods, paying the cost of production called *bani*.

There are about 100 Muhammadans and 20 Hindu *beparies* (smaller dealers) working under the *mahajans*.

The Muhammadans *beparies* without payment take delivery of various goods of which 65 per cent. is local produce and 35 per cent. imported goods in the months of August and September, and go out in boats or

carts to Barind, and the interior of the districts of Malda, Dinajpur and Rajshahi, *i.e.*, within about 60 miles radius. The *beparies* sell these goods either by exchange for old wares, or for cash, or both, but most of the goods are sold on credit to individual customers. The *beparies* on return hand over to the *mahajans* the old wares and a little cash. These *beparies* go out again with a small quantity of fresh goods from the *mahajans*, sell the goods for cash or by exchange, or by both, and realise the prices of credit sale from the customers in the month of December and January, and come back and settle up accounts with the *mahajans*. Similarly, the Hindu *beparies* go out in October and November to make *dadans*, as they call it, and realise the prices in April and May. By this *dadan* system through *beparies* the *mahajans* dispose of about 75 per cent. of their produce, and the remaining 25 per cent. is disposed of locally, or by supplying orders to Rajshahi, Dinajpur, Malda and Purnea by direct transaction on cash payment. Thus by this system the *mahajans* manage to sell goods of local produce worth Rs. 3,60,000 and imported goods to the value of nearly Rs. 2,00,000. This system is risky. Advances of large quantities of finished goods are given to *beparies* most of whom have not sufficient property to offer as security for the value of goods received from the *mahajans*, and occasionally the *mahajans* lose by this system. In the face of such organisation of sale I have grave doubt whether any other organisation will be successful until and unless, individual customers are educated and their social system is changed. These utensils are required for social functions, etc., at a time when the people are in want which necessitates credit purchase. *Mahajans* are satisfied if they get a return of 12 per cent. on the invested capital and this rate cannot be considered too high when the risk taken is considered. Of course the *beparies* have no fixed price for their goods, and they in some cases are compelled to make much profit, in order to cope with the risk that exists under the present system of credit sale.

The total quantity of brass and bell-metal wares produced in the district of Malda is 6,700 maunds, the approximate value of which would be 5 lakhs of rupees per year.

Silk reeling industry.

Silk reeling is the most important industry of the district. It is being conducted on both a small and a large scale. The dried cocoons are procured from *hâts* and also from rearers direct. Reeling is now entirely conducted on country *ghais*.

The dried cocoons, after being steamed, are put into boiling water contained in a basin heated by direct firing. Each basin is operated by a *Katani*, who takes the thread from the cocoons and throws it over the *ghai*. A boy turns the wheel and so winds the yarn. The following table will show the villages where the industry is mainly carried on:—

Names of villages.	Number of families.	Number of reeling basins.	Maximum number of men engaged.
English bazar thana—			
Rajanagar	17	70	160
Lakshmipur	70	233	520
Amriti	7	46	75

Names of villages.	Number of families.	Number of reeling basins.	Maximum number of men engaged.
Pirojpur	21	68	145
Fulbari	4	12	28
Bibigram	17	37	85
Hyderpur	40	116	250
Mirechak	17	59	135
Mehedipur	5	12	28
Makdampur	2	7	16
Purapara	2	4	9
Bashbarikaltapara	3	8	18
Bangalgram	1	8	18
Atgama	2	14	20
Raipur	8	31	70
Gopalpur	2	10	13
Shakarma	6	20	25
Kaliachak thana—			
Agamilki	1	12	27
Alipur	1	10	22
Nazirpur	7	11	25
Shershahi	1	22	50
Brommottra	2	4	9
Chandpur	3	54	125
Sujapur	70	132	300
Lilampur	1	12	27
Bakharpur	17	130	300
Lakshnipur	4	120	270
Mahimpur	11	26	70
Bamangram	14	26	70
Baktiarpur	1	2	5
Chashpara	37	72	165
Gandiarvapara	5	10	22
Goyeshbari	97	205	470
Golabgunj	5	124	290
Charianantapur	4	60	130
	504	1,787	3,992

The number of *ghais* shown above include those concerns which are conducted on a large scale. It may safely be stated that there are nearly 2,000 *ghais* in the district, as stray *ghais* in isolated villages might have been omitted. The industry is very unsteady as the reelers entirely depend upon the local production of cocoons as cocoons cannot be procured from other places. No proper estimate of the yearly outturn of silk can be made in the absence of proper statistical figures. Figures are not available even from owners of *ghais*, which are very irregularly worked. It is reported that the average yearly outturn per *ghai* is about 2 maunds of raw silk. The maximum capital required for each *ghai* is Rs. 200.

Practically speaking the business is entirely in the hands of Marwari merchants, who advance money to reelers to purchase cocoons which become available at different seasons. The reelers stock dried cocoons which are gradually worked out on *ghais*. This stocking of cocoons necessitates the reelers having a fair amount of capital in their hands. This capital is advanced by merchants who depend upon good faith. Marwari merchants in return receive the silk at current market rates, or on conditions which will be dealt with in the note appended. A

microscopic part of the total silk produced is consumed by the silk weavers of the district. The approximate consumption of the district is 55 maunds only. It is reported that Malda silk to the extent of about 400 maunds is being consumed by the silk weavers of Bishnupur and Birsingha in the district of Bankura. The great bulk of silk goes to Madras. It may be mentioned here that the local merchants dispose of silk mostly by post to merchants of Berhampore (Ganjam), Trichinopoly, Salem, Triplicane, Masulipatam, Travancore, Secunderabad, Belgaum, Surat, Sujanagar (Gurudaspur), Mobarakpur (Azimgarh), Bijnour, Amritsar, Anantapur (M. S. M. Ry.), North Arcot, Bangalore, Tanjore, Bhandara, Akyab, Kayts (Ceylon), Chittagong, Bankura, Benares and other places.

It is interesting to note that business is conducted on the credit system which raises a great obstacle to fresh parties wishing to take up this business.

A new firm under the name of Khan Brothers & Co., whose proprietors are all influential local gentlemen, is trying to organise marketing of silk on advantageous terms to local reelers but they could not push sales, not being able to take the risks of credit business.

Matka weaving industry.

Englishbazar thana, Goyeshpur village.—Six families with 6 country pit looms are engaged in matka weaving. The workers are all Tanti by caste, and have no other occupation. Mostly *chadars* and *saris* are made. Matka yarn is procured locally from Marwari dealers. About 300 seers of Matka yarn valued at Rs. 4,500 is consumed yearly. The approximate price of the finished goods come to Rs. 6,000 per year, and is disposed of to local dealers. The number of the weavers is too small for co-operative organisation to be commenced.

Jyot village.—There are three establishments with 13 fly-shuttle and one country loom in this village. *Chadars*, *saris*, *dhutis* and *thans* are made. In all about 40 persons, including boys, are engaged on monthly wages. The proprietors are all men of means and get their supply of matka yarn from Jalalpur, the centre of the business and from the local dealers.

The yearly consumption of raw materials is about 800 seers at a cost of Rs. 10,500. The approximate value of the finished product is Rs. 20,000. The goods are made according to orders and sold to individual customers and local dealers.

The establishment of Babu Narendra Nath Roy, P. O. Kotwali, is especially worth mentioning, as he is very particular about the uniform quality of his produce, and for this reason he is patronised by many influential customers of the town. This is the only place where matka cloth of uniform quality is available.

It may be noted here that though fly-shuttle looms have been successfully introduced, still the production does not seem to be promising. The outturn is only $1\frac{1}{4}$ to $1\frac{1}{2}$ yards per day of 8 hours.

Sibgunj thana, Narattampur village.—There are about 33 families of weavers (operating about 53 country looms) engaged in weaving matka *dhutis*, *saris* and *chadars*. Of these 53 looms, 18 (belonging to 11 families) are being worked independently, *i.e.*, without the help of

mahajans. Most of the people have land (from 3 to 50 bighas a family), which are cultivated on the *adhi* system. All of them are Tanti by caste.

Mohanbag village.—There are only three families with four country looms in this village. All are dependent on *mahajans* and are Pundari by caste. They have no secondary occupation.

Sibnagar village.—There are only 4 families of weavers with 5 country looms. All are Pundari by caste, and have cultivation as a secondary occupation.

Dewanjagir village.—There are only 4 families with 6 country looms. All are Malo by caste, and have no secondary occupation, and are dependent on *mahajans*.

Matka weaving in Sibgunj thana, Malda district.

Names of villages.	Number of families.	Number of looms.
Narattampur	33	53
Mohanbag	3	4
Sibnagar	4	5
Dewanjagir	4	6
	44	68

As the above four villages are situated near each other and lie within the jurisdiction of Sibgunj thana, the general condition of the work and business are embodied in the body of the report.

Raw materials.—Matka yarn dealers come to these villages from Jalalpur side and yarns are purchased in small lots, sometimes on a cash basis and sometimes on credit. Yarns to the extent of nearly 3,000 seers, valued at about Rs. 42,000 are consumed yearly.

It may be stated here that yarn loses about 33 to 35 per cent. of its weight during the process of bleaching.

Finished product.—*Saris* with red borders, *dhutis*, *chadars* and thans to the extent of about 20,000 yards, valued roughly Rs. 55,000, are made annually. Fifty per cent. of the produce is *sari* and *dhuti*, 33 per cent. *chadar* and 17 per cent. than.

Weavers' income.—The average income of a weaver helped by a female member of his house hardly exceeds Rs. 15 a month. Actually it varies from Rs. 12 to Rs. 14 per month.

Organisation of sale.—A considerable portion of the produce is bought by local people. *Mahajans* dispose of a portion of the product to smaller whole-sale dealers who come to these localities to make purchases, and a larger portion to known shop keepers of English Bazaar, Rajshahi and Calcutta. It may be stated here that some of the weavers also conduct purchase and sale of finished products.

Difficulties.—(1) As the yarn is made by hand from pierced cocoons in takko, it is hardly uniform. The weavers pay higher prices for it and no assortment is possible when purchase is made in small lots.

(2) Considerable difficulty in making warp during rains is experienced.

(3) Most of the weavers sell off their produce to local *mahajans* at price less by Rs. 1-8 to Rs. 2 per piece than otherwise they would get.

Suggestions of improvement.—The weavers' income may be increased by about 50 per cent. if they are induced to organise themselves into a co-operative society, on lines detailed below:—

(1) The society should conduct the purchase of *matka* yarn in big lots, which should be distributed amongst members after proper assortment, either on sale or loan system.

(2) The society should undertake to receive all finished goods brought by members, and organise their sale as is at present done by the *mahajans*.

(3) The society should make the necessary arrangements for shades and other improved appliances for making warp, particularly during the rainy season, at a central place convenient to all members.

(4) In addition to the above the society should also do the work of a rural co-operative bank.

(5) Attempts should also be made to introduce fly-shuttle looms provided they are found suitable for all purposes after proper demonstration.

Pure silk weaving.

Sibgunj thana.—There are 5 villages at close quarters in Sibgunj thana where pure silk weaving is carried on. This is one of the most important industries of the district of Malda. The industry of these 5 villages put together, is called the silk industry of Sibgunj. For convenience sake statistics of looms, families, etc., are given in the table below. All the weavers are Tanti by caste, except one Muhammadan family with four looms. The looms are old country pattern with primitive arrangements for making border designs.

Name of villages.	Number of families.	Number of looms.	Yearly outturn in terms of <i>sari</i> .
			Pieces.
Puratan Alidanga	12	23	850
Nutan Alidanga	11	19	700
Sibgunj proper	1	3	75
Dewanjagir	12	28	975
Hazaridanga	20	39	1,500
	56	112	4,100

General condition.—Out of 56 families 22 work quite independently of *mahajans*, 12 work partially helped by *mahajans* and 22 families are entirely dependent on *mahajans*. The condition of most of the weavers is fairly good, and some of them are fairly rich. Twenty-seven families have lands, varying from 3 to 400 bighas, cultivated mostly on the *adhi* system. Some of the rich weavers are themselves *mahajans*. The number freed from the clutches of *mahajans* yearly increase.

Raw materials.—Silk of better quality produced in Malda district is consumed and the yearly consumption is estimated to be about 1,540 seers of silk valued about Rs. 53,000. The raw silk loses about 20 to 25 per cent. of its weight during the process of bleaching.

Finished product.—*Saris* with plain and designed borders, *dhutis* and *chadars* are made, but *saris* are in greatest demand. Total yearly output, in terms of *sari*, is nearly 4,100 pieces, valued at about Rs. 84,000.

Weaver's income.—The average income of a weaver, helped by women members of his family, is about Rs. 24 to Rs. 25 per month, excluding the cost of dyeing, rewinding and twisting of silk for warp, and also cost of making warp. The cost of dyeing, rewinding, twisting and warping comes to about Re. 1 per piece.

Special features of work.—There is a band of about 5 workers in the locality whose business is to make the warp for the weavers. Wages of such men average about annas 12 per day. There is another class of special workers whose business it is to do only twisting of yarn for warp. The wages of a man helped by a boy for twisting comes to about Re. 1 a day. A band of men who do twisting for weavers will number 10 men and 10 boys more or less. Both warpers and twisters are all Muhammadans.

Weavers dye their own yarn, all colours except black. They get their yarn dyed black in Murshidabad. It is reported that lac dyeing of silk is still known to some of the most senior weavers but this method is not practised now.

Organisation of sale.—It is reported that 50 per cent. of the produce is consumed by people of the district, and 50 per cent. goes outside. *Mahajans* collect the goods and dispose of them to merchants of Rajshahi and Calcutta. Sometimes sales are made to small wholesale dealers who go from place to place to dispose of the fabrics. There is no fixity of sale by the weavers, who work quite independently of *mahajans*. The weavers have not sufficient means to stock materials in large quantity but sell their goods to any customers to suit their convenience.

Capital required.—The minimum capital that is required to work a loom independently is nearly Rs. 325.

Difficulties.—(1) Want of sufficient capital by a large number of weavers is felt.

(2) Great inconvenience is experienced in making warp during the rains.

(3) Occasional outbreak of fire causes havoc in this industry, as houses of most of the weavers have thatched roofs.

Suggestions of improvement.—(1) Introduction of modern dobby, or other simple improved system for border design by deputing a peripatetic weaving instructor with a loom or looms having those arrangements.

(2) Introduction of fly-shuttle or automatic looms suitable for *garad* cloth (provided that the output is considerably greater than 3 cubits per day of 8 hours) with designed borders, by having a practical demonstration at Sibgunj.

(3) To organise a co-operative society based upon principles as suggested under *matka* weaving of Narattampur village (*vide* page 87 of this report).

Katari weaving industry.

Englishbazar thana, Shahapur, Bala, Nageswarpur villages.—*Description.*—Katari cloth is a fine coloured fabric made out of a combination of silk and cotton. Pure silk yarn is used for warp and fine cotton for weft. Red, yellow, deep-blue, patched yellow silk and black cotton yarns are commonly used. To meet special orders silk yarn for both warp and weft is also used but such demand is extremely limited.

General condition.—The weaving of this fabric is carried on in several adjoining villages, by Muhammadan weavers for 6 months during the year. It is reported that the weavers cannot carry on this work during the rainy season due to the damp state of the atmosphere, and also during very hot days owing to frequent breakages of yarn. During the mango season almost all remain very busy with the mango business and not a single loom can be seen working. Seventy-five per cent. of the weavers have lands varying from 5 to 100 bighas in extent, cultivated on *adhi* system.

Statistics.—Sixty-five families with about 100 country pit looms in the above villages are engaged in the industry. All the weavers are Muhammadans.

Raw materials.—About 700 seers of Malda silk (the approximate value of which comes to Rs. 21,000 and about 1,700 lbs. of black cotton yarn of 60's and 120's (the value of which comes to Rs. 3,500) are used.

The local weavers themselves dye silk yarn at a cost for dyeing dye stuff and other materials of about Rs. 2,300. The total cost of raw materials, etc., is approximately Rs. 26,900.

Finished product.—All goods are woven in thans of 8 yards in length and 27 inches in width. The yearly outturn is about 4,000 thans, the value of which is Rs. 45,000. All goods are of nearly the same pattern, though under different names, according to the arrangement of the coloured warp.

Condition and organisation of the business.—Capital required for the industry is wholly financed by 5 or 6 *mahajans*. From these *mahajans* the weavers get supplies of raw materials at market rates, and their family expenses. Accounts are adjusted at the end of the season. The weavers get 25 per cent. of the amount accruing from the sale of goods as their wages. In addition to wages they receive 50 per cent. of the net profit. So they are working partners in the business. Hence the income of all weavers in the shape of wages is Rs. 11,250 and as their share of the net profit they get Rs. 3,375. Thus the total receipts of the weavers comes to Rs. 14,625 and the *mahajans'* share comes to Rs. 3,375. These figures are calculated from the estimated figures shown under heads "Raw materials" and "Finished product." These weavers also become working partners of the capitalists in the mango business during the mango season. It may be stated that the capitalists are not dealers in these goods. The sale of goods are arranged and conducted through recognised brokers, and goods are finally disposed of, at the joint cognisance of both the weavers and capitalists and are delivered either from the custody of weavers or capitalists, according to circumstances. The system of business of this place is undoubtedly based upon the most efficient system that has come to my notice. It may be interesting to note that these Katari pieces are, so far as my information goes, exported to the coasts of the Persian Gulf and Jeddah, through Bombay merchants

and these goods have practically no local sale. The industry is not in the same thriving condition as it once was, due to the fluctuating condition of market rates of silk and finished product. It was reported to me that some had to dispose of their goods after stocking for 2 years due to unfavourable conditions of the markets.

The average income of a weaver when helped by the members of his family is about 25 per working month in the present condition of the market.

There is scarcely anything to suggest for improvement in the organisation of this business. Samples of these cloths may be collected from the weavers and attempts may be made to get current rates for these goods from Bombay or Jedda merchants for dissemination, to the weavers, of this information so that they may know the exact condition of the market. As to the technical side of the thing, the Superintendent of Textiles, or any other weaving expert, may be deputed to see whether it may be possible to introduce any improved loom suitable for the production of these goods.

Tanning and shoe-making industry.

Hyderpur village (Englishbazar).—Nearly 22 persons are engaged in tanning on a very small scale by crude country methods, hides and skins being locally procured. Liming is done in earthen vessels. After unhairing and fleshing, the pelt is washed in water and steeped first in Babool pod and secondly in Teri pod liquors. Tanning is finished by the bag method with chopped parasite plant grown on mango trees. They generally do tanning for 3 months and are engaged in shoe-making for 6 months. Shoes are stitched with leather and are of Munda type, the uppers being of natural tan colour leather. Each person with the help of women members of his house makes about 20 pairs a month. There is a ready sale for this class of shoes, and *beparies* purchase the product in big lots during the *mêla* time, an average price for a pair of shoes being only Rs. 2.4. The approximate value of the total outturn comes to Rs. 5,000 only. The economic condition of the tanners appears to be quite good.

During the mango season, for three months, almost all of these people engage in the mango business, which is very profitable, and for which capital is always available.

These people are not willing to make a better class of shoes, as they do not expect local customers to pay higher rates.

They are not inclined to combine for the purpose of joint work without which no improvement is possible, as mentioned in the note under Rajshahi District page 76.

N. B.—As the report is a self-contained one, no separate note is attached.

Note on the brass and bell-metal industry.

The industry of making brass and bell-metal wares in the district is being carried on in Englishbazar and Nawabganj and several villages. Nearly 450 persons both Kansaries and Muhammadans are employed in this work. The total quantity of finished product is about 6,700 maunds, the value of which would be about Rs. 5,00,000. This industry is one of

the most important industries of the district. Special attention may be drawn to the system of sales organisation stated in page 82 under head "Organisation of sale."

Practically speaking the whole industry is in the hands of *mahajans*, who play no less important parts than the actual workers do. The *mahajans* supply capital and raw materials and organise the sale of the finished goods, making a profit of about 12 per cent. on the capital they invest. Such a profit cannot be considered unduly high as the business is exposed to great risk. Under existing circumstances there is little possibility of co-operative organisation in this country. The workers, as has already been stated, are deeply in debt; and having liabilities greater than their assets, will not be financed by any bank whether co-operative or private. The formation of co-operative societies will be only possible when Government is prepared to risk a large sum of money for their initial operations.

It has been stated that some of the men who do the beating out process, leave during the paddy harvesting period, and engage in the mango business during the mango season. Sufficient labourers cannot be obtained to replace those who leave owing to the extremely hard nature of the work." Thus workshop owners experience great difficulty and a time may come when recruitment for that sort of arduous toil will not be at all available. The industry may then collapse for want of that particular labour, unless means be devised to have that particular work done by mechanical means. For this I would suggest that test work should be undertaken in workshops where there are mechanical hammers and other labour-saving devices so that the present special workmen engaged in this industry can use the machine. If the test work proves satisfactory, the *mahajans* or shop owners may easily be induced to instal mechanical hammers driven by oil engines. This I am sure will materially help the workers and give great impetus to the industry. No difficulty will be experienced in finding a market if the production be increased. *Mahajans* are of opinion that they can easily sell all goods made, even if production be doubled.

In Kasharipara (Nawabganj) articles to the extent of about 2,300 maunds are delivered to *mahajans* without final scraping and polishing. This work I think can be done on a power driven lathe. Should mechanical hammers prove successful, and should an installation be introduced in the locality the experiment of final scraping and polishing by power driven lathes may be undertaken in the same workshop.

The economic condition of the workers of this district seems to be better than that of Rajshahi district workers. The average income of a real worker is about Rs. 18 to Rs. 22 per month.

Note on silk-reeling industry.

The most important of all industries in the district is silk-reeling. There are nearly 2,000 *ghais* extended all over the district. The present market for Malda silk is mostly in the hands of Marwari merchants, who advance money to reelers to purchase cocoons which are only purchasable at certain different seasons. The reelers stock dried cocoons which are gradually worked out on *ghais*. This stocking of cocoons necessitates that the reelers have a fair amount of capital in their hands. This capital is advanced by Marwari dealers, who receive the outturn of silk from the

reelers in return. Accounts are adjusted after the disposal of the silk. In some places the reelers get loans from the silk merchants at a rate of interest of about 13 to 15 per cent. They deliver their produce of silk to the merchants and leave it to their sweet will for sale. The merchants are not responsible for any loss or shortage of goods, which are left in their custody. It is not improbable that these merchants deceive the reelers by selling the goods at a higher rate and showing lower sale prices to the reelers, who also have to pay interest on their loans till the sale of goods are shown in their accounts. Under ordinary circumstances the reelers cannot know their exact position as sales are entirely in the hands of the merchants. The reelers cannot take up a stronger position being afraid of having to close down if the merchants chose to stop making advances. Such being the case the reelers are at a great disadvantage.

To enable reelers to work on a co-operative basis even with proper arrangements for their finance and to better their condition any improvement will have to be gradual to commence with as market conditions will remain practically the same. The reeler members of the newly formed co-operative society will not be able to properly manage the sale of their produce, until and unless they understand the condition of the market fully and become acquainted with the dealers in or actual customers for silk.

Proposals for two test cases of reelers' co-operative societies in the villages of Sujapur and Goyeshbari are pending before the Registrar. Each society will require a capital of Rs. 50,000. The working of these two test cases (if given effect) should be carefully studied before attempts are made to organise further co-operative societies. In this connection it will not be out of place to cite resolutions passed at a meeting of the directors of the Malda Central Co-operative Bank held on the 30th June 1922:—

“Resolved that Malda Central Bank is prepared to organise two silk societies in this district provided it gets the following facilities:—

- (a) That a loan be granted up to one lakh of rupees from the Federation, or other sources, at a rate of 6 per cent. per annum interest, to enable the Central Bank to keep a margin of 3 per cent. profit. On enquiry from the experts of the Sericultural Department, we have been informed that silk societies would not take a loan on more than 9 per cent. interest. About one lakh of rupees will be necessary to finance those societies.
- (b) That a cash credit for at least Rs. 50,000 be granted to the Central Bank from the Federation.
- (c) That a specially qualified officer be deputed by either the Sericultural or the Co-operative Department for proper supervision of the societies.
- (d) That at least 12 members join each society and that it should be made imperative that on enquiry the amounts advanced should be covered by assets.”

“Resolved that as some of the members of the affiliated societies of the Central Bank reel silk even now and as the Bank has some silk thread for disposal at its command, the Registrar be requested to secure orders for silk thread immediately and that the Central Bank be authorised to supply the orders from the Registrar.”

Apart from the special facilities embodied in the first resolution, great attention should be paid to the last which arises out of apprehension, lest difficulties arise concerning the marketing of silk that may be produced by the proposed reelers' societies in future.

In order to safeguard the interest of the Co-operative Central Bank its authorities come forward with the utmost caution in consideration of the fact that the silk business is always very risky.

It has already been stated in the body of the report that the firm of Messrs. Khan Brothers & Co. has experienced difficulty in pushing the sale of silk on a purely cash-payment system. The proposed reelers' society, if it come into existence, will have to face the same difficulty as the existing rules will prevent it from carrying on credit business with non-members. It is understood that Marwari merchants charge 9 per cent. interest on the value of goods supplied (from the date of supply to the date of repayment) and 1 per cent. brokerage on their credit sale.

In the face of such difficulty the best course open to us is to first tackle the problem of the supply of silk as raw material to the silk weavers of the home presidency. There are plenty of silk weavers in the districts of Murshidabad, Bankura, Birbhum and Malda and they consume a large quantity of silk.

If successful co-operative organisation with the silk weavers of the presidency be effected, at least in the matter of supply of their raw material, the question of the market for a great part of Malda silk will be solved. The present system of organisation of sale of finished product of silk weavers may not be disturbed to begin with. After the formation of silk weavers' societies, the question of silk reelers' societies may then with great advantage be taken up, as the finished product of one class of societies may be consumed as raw material by another class of societies. In any case the reelers' societies will have to be organised gradually, by which time the older societies, having opportunities and experience gained in the meantime, will be able gradually to capture new markets. The question of the formation of a silk weavers' society will be dealt with under the silk weaving industry.

Another thing which has impressed me greatly is the great wastage of fuel in heating each basin by an independent furnace. The people daily experience difficulty in procuring fuel and its price goes up rapidly. If the present system be allowed to continue, a time may come when the industry will face a serious catastrophe, either by shortage of wood fuel or by its prohibitive cost. The experts will have to devise a suitable plan to remedy this evil.

Note on matka weaving industry.

The industry is carried on in four villages within the jurisdiction of Sibgunj thana and two villages within the jurisdiction of English bazar thana. There are in all 89 looms, of which 14 are fly-shuttle ones including a stray loom in Nageswarpur village.

The total quantity of yarn consumed yearly is nearly 4,100 seers; the approximate value of which comes to Rs. 57,000.

The approximate value of the annual outturn of these goods is about Rs. 81,000.

A considerable portion of the produce is consumed by the people of the district; the remaining portion is disposed of in Rajshahi and Calcutta. A large number of weavers work with the help of *mahajans* and the general condition of the weavers is not unsatisfactory.

Co-operative organisation is possible in those villages within the jurisdiction of Sibganj thana where the major portion of the work is carried on. The weavers' condition would be much improved if a successful co-operative organisation could be effected on sound lines, conducted by a band of honorary workers from amongst the weavers themselves. The efficiency of work at present done on fly-shuttle looms does not seem to be promising. Attempts should however, be made to produce heavier stuff with twisted yarn. If a market were created for such goods by the presentation of a few sample pieces, the introduction of fly-shuttle looms will no doubt be very effective. The Department of Industries may allot money for the collection of similar sample pieces in order to study the condition of the market. If this is found promising, attempts should then be made to introduce simple machines for making twisted yarn.

Note on the silk weaving industry.

There are 5 villages within the Sibgunj thana where pure silk weaving is carried on by 56 families with 112 country looms. Silk *saris*, *dhutis* and *chadars*, commonly known as *garad* are made. About 1,540 seers of Malda silk are consumed, and the approximate value of the goods produced is Rs. 84,000. Nearly 22 families conduct the business entirely with the help of *mahajans*, and the number of such families is gradually decreasing. Some of the rich weavers are *mahajans* themselves, and the general economic condition of the weavers gradually gets better. The average income of a weaver comes to about Rs. 25 per month.

All attempts should be made to introduce fly-shuttle or automatic looms having greater efficiency, in the production of work than the present type. The weavers should be taught to adopt modern dobby or other simple arrangements for working designed borders.

Simple machines for twisting yarn should be devised and introduced. All possible effort should be made to bring the workers under co-operative organisation as regards the supply of raw materials, for reasons stated in the note on silk reeling industry page 91, as well as for the general improvement of the workers. A question will no doubt arise as to the matter of finance. There are industries in which a worker requires a fairly large capital which would not have been available, had he been required to give securities for that sum. Such industries are at present financed by *mahajans* depending upon the good faith of the borrowers. Let the case be made quite clear by a definite example. An industrialist requires a sum of Rs. 400 to carry on his business independently, and owes a sum of Rs. 250 to the *mahajan* and the value of all his property is only Rs. 100. No bank, whether co-operative or private, under the present circumstances will finance such an industrialist. This is the position in which the majority of workers in the brass and bell-metal, silk reeling and silk weaving industries stand. For this reason there is not a single industrial co-operative society of workers of those industries in the districts of Malda and Rajshahi. With the single exception of Kanaikhali

where the community is small, and where only special kinds of light articles are made and for which small capital is required there are no co-operative societies.

It may be stated here that the reelers who have been selected for the membership of two test cases of reelers' societies (of which mention has been made in the note on silk reeling industry on page 91) might be considered as the most solvent section of the reelers.

It is also understood that there is not a single silk weavers' society in the district of Bankura, though there are thousands of silk weavers in Bishnupur, Sonamukhi and Birshingha. The Industrial Union of Bankura has as many as 47 cotton weavers' co-operative societies affiliated to it, but it certainly appears strange to find a total absence of silk weavers' societies there.

It may be accepted that the question of finance is at the root of this phase of things. The matter has been dealt with at great length in view of the importance of the question, but until a satisfactory solution of financing those industries is arrived at, the real toilers will remain where they are, at least for a long time to come. As an experiment Government may sanction an industrial loan without interest, for a specific period to a group of silk weavers of an important centre, taking a similar risk as the *mahajans* at present do. The weavers of the worst type with respect to financial position should be selected for the purpose and be brought under co-operative organisation, after they are extricated from the clutches of *mahajans*, and a special officer should be deputed to supervise and control the work. If the experiment proves successful, it may then be extended gradually to other centres, and finally to other industries.

Vigorous attempts should at the same time be made to bring silk weavers of better financial position under co-operative organisation.

Note on the katari weaving industry.

Katari is a fine fabric made mostly out of silk warp and fine cotton weft. The katari industry is rather limited and is carried on in a group of several adjoining villages commonly known as Shahpur, within the jurisdiction of Sadar thana. Raw materials are mainly Malda silk and black yarn of 60's to 120's the total value of which would be about Rs. 27,000 including the cost of dyeing and dye stuffs. The approximate value of the finished product is Rs. 45,000. The industry does not display the thriving condition it once used to, due to the fluctuating condition of the market. It is understood that the finished product is exported to Persian Gulf ports and Jeddah through the agency of Bombay merchants. It may be interesting to note that the business system is conducted on sound lines. The subject has been elaborately dealt with under head "Condition and organisation of the business" on page 89 of this report.

The industry will no doubt thrive again, if suitable markets be found. For the present, samples of such cloth should be collected on payment, and attempts be made to get rates of these goods from merchants of Bombay, Jeddah and other places for dissemination of information to the weavers in order to enable them to know the condition of the markets. As the weaving of this particular class of fabric is highly technical, suitable experts may be deputed to devise improvements with regard to looms, appliances and methods.

* PABNA DISTRICT.

Cotton weaving industry.

Cotton weaving is the most important of all cottage industries in this district. It is carried on more or less throughout the district. There are nearly 100 villages where cotton weaving is done.

The names of villages where 100 or more looms are in use are given below:—

Name of villages.	Total number of looms.	Number of fly-shuttle looms.	Number of old country looms.
1. Delua	1,700	18	1,682
2. Khukheri	600	30	570
3. Randhunabari	500	100	400
4. Tamai	500	225	275
5. Shuhagpur	500	2	498
6. Panchlia	400	150	250
7. Sibpur	360	100	260
8. Ruknia	300	7	293
9. Sadullapur	300	197	103
10. Enayetpur	255	225	30
11. Raghobpur	250	225	25
12. Bagdi	220	200	20
13. Ekdanta	200	125	75
14. Chala	200	.....	200
15. Bejghatti	200	.....	200
16. Aminpur	150	40	110
17. Mashunda	145	29	116
18. Dokachi	140	80	60
19. Nandangathi	113	3	110
20. Ghoradaha	100	41	59
21. Gangarampur	100	20	80
22. Nischantapur	100	75	25
23. Haripur	100	.....	100
24. Maharajpur	100	.....	100

The main centres of cotton weaving industry are as follows:—

(1) *Serajganj subdivision*.—Delua, Shohagpur, Tamai, Ajugahr, Manikpur, Sachupur, Randhunibari, Enayetpur, Chhotadhool, Basantapur.

(2) *Sadar subdivision*.—Aminpur, Mashundha, Manikdia, Chala, Sibpur, Gopalpur, Chittalia, Tingacha, Godullapur, Nischintapur, Daripara, Mulgram, Haripur, Singail, Pailanpur, Jagannathpur, Buthor, Baludiar, Raghobpur, Sibrampur, Ekdanta, Khukheri.

The probable number of hand looms will be 10,000 of which the number of fly-shuttle looms will be about 3,000.

The industry is confined to Muhammadan Jolahs. There is a small number of Hindu Tanties near Pabna Town and other places.

About 10 per cent. of the weavers have agriculture as their secondary occupation.

The yarn used is mostly English. Japanese yarn is used in some cases. It is procured from Calcutta and sometimes from Kusthia (Nadia)

by big yarn dealers. It is then distributed all over the district at great centres through the middlemen. 20's, 22's, 24's, 26's, 32's, and 40's yarn are generally used. Yarn of 60's to 1290's is also used to a limited extent by a few Hindu weavers who turn out fine cloths.

The weavers generally purchase the yarn on credit from the middlemen at a high rate of interest. Sometimes they get yarn on credit at a low price if they are ready to sell the finished products to the middlemen. Sometimes the weavers borrow money at a high rate of interest to enable them to purchase yarn. They are rather regular in repaying the same every week. The income of a weaver when helped by his family members varies from Rs. 15 to Rs. 20 per month.

The weavers generally work 6 hours a day, 3 hours in the morning and 3 hours in the evening. The children and women assist the weavers only in setting up the warp and winding the bobbins in their leisure hours, after finishing their house-hold duties.

It may be roughly stated that yarn both grey and coloured to the value of Rs. 50 lakhs is consumed yearly in the district for the manufacture of cotton fabrics.

Ordinary clothes for women and children, *gamchas*, *chadars* and *lungis* are generally manufactured; fine *dhutis*, *saris* and shirtings are made by a few Hindu weavers. Formerly very fine cloths used to be made in large quantities but now-a-days fine cloths are only made in the villages of Sadullapur, Nischintapur and Aminpur within Sadar subdivision and Gachapur, Chhoto Dhool, etc., within Serajganj subdivision.

It may be roughly stated that cotton fabrics to the value of Rs. 80 lakhs are produced annually in this district.

The finished fabrics are generally sold to the middlemen and the villagers in the *hâts*. Sometimes the middlemen collect from the weavers' houses.

The great centres of trade for local made cloths are—

- (a) Ekdanta, Mathura, Sujanagar, Banagram, Dhulauri, Kashinathpur, Pailanpur, Bhangra, and Demra in Sadar subdivision.
- (b) Delmar *hât* (Belkuchi), Shohagpur, Shahajadpur, Koijuri and Ajugacha in Serajganj subdivision.

The standard of living for both the weaver and his neighbouring agriculturist is the same, but the former appears to be better off.

The weavers, as a rule, do not like agricultural work but those who want to raise their social status and dislike being called Jolas are gradually taking to agriculture; the number of such people is very limited.

Yarn is, to a very limited extent, dyed locally. As a rule the weavers purchase coloured yarn. Indigo dyeing is mostly prevalent. The industry has expanded considerably in the district during recent years. This is due to the rise in the price of English and other foreign cloths and it is doubtful whether it will keep up its position when the price comes down.

Rope and string making industry.

The rope and string making industry is carried on to a very limited extent in the district by a class of people called *Jalia Kaiyartas*, on the

river side of Serajganj subdivision and on the Bera Nakalia side of Sadar subdivision. In all about 600 persons are engaged in this industry. Generally they make string called *Goon* from Sunn hemp. Such strings are used for towing boats and can only meet local demand. The Sunn hemp required for this purpose is purchased from *paikars*, who bring it to the string-makers' houses for sale at a rate of Rs. 5 to Rs. 8 per maund. The *paikars* at the same time purchase the tri-ply strings for sale.

Single-ply strings are first made by Takku both by males and females. The *Kaivartas* generally work 7 to 8 hours a day and earn about Rs. 10 per head per month. Their women add to their income by making fishing nets during their spare time. During jute season these people are some times engaged by jute firms for making ropes.

This is an industry of which nothing can be suggested for its improvement.

Basket-making industry.

This industry is carried on more or less all over the district by *Moochis* known as "Betuas". The baskets commonly called *dhamas* are made of split canes and are exported to Rajshahi and Calcutta through middlemen. A worker earns about Rs. 8 to Rs. 10 per month by making *dhamas*, which are sold from annas 4 to annas 12 each, according to the quality and size. They are made in sizes to contain from 3 to 15 seers of grain.

Nothing can be suggested for the improvement of this industry.

Note on cotton weaving industry.

Cotton weaving may be considered the only cottage industry of the district. It extends over hundred villages throughout the district. There are nearly 10,000 looms turning out cotton fabrics of different kinds to the value of about 80 lakhs of rupees. A large quantity of these goods is exported to other districts of Bengal. The introduction of fly-shuttle looms has made considerable headway. The proportion of fly-shuttle looms to old country looms is 3:7. There are a peripatetic weaving school and a central weaving school (Pabna Town) in the district. Both these schools are doing very useful work for the benefit of this industry. Weavers generally purchase yarn on credit from middlemen and they are more or less encumbered. The industry is confined to Muhammadan Jolas and the number of Hindus *Tantis* or *Jugis* is rather limited. The weavers as a rule do not like to take to agriculture. The finished fabrics are generally sold in *hâts*. Sometimes the middlemen collect the produce from the weavers' houses. The weavers lose considerable time in disposing of their produce, as they are to attend *hâts* every week for the purpose.

The industry has expanded considerably in the district during recent years due to the abnormal rise in the price of English and other mill-made cloths but it is doubtful whether it will keep up its present position when the price comes down. The price of cotton fabrics has already fallen considerably though the price of yarn has not come down

proportionately. This sudden change in the price of piece goods is already being felt by the hand loom weavers. If this state of affairs is pushed further the hand-loom weavers will face unsurmountable difficulties in keeping up their position, unless some sort of State help is given.

There are only six weavers' co-operative societies in the district and their work is only that of a loan office. There is no attempt for joint purchase of raw materials and sale of finished products. Several attempts were made to arrange for the supply of yarn to the Titalya weavers' co-operative society but it was found that yarn could not be supplied at a cheaper rate than that of the local *mahajans*. It may not be out of place to mention here that the existing co-operative sale and supply societies, cotton weavers societies, yarn banks and industrial unions in the presidency have not been able to compete with the local *mahajans* or dealers. It is curious, that, as a rule, the rates of yarn at these co-operative organisations are considerably higher than the local market rates. Until this anomalous condition is removed somehow or other, the supply of yarn by these organisations cannot meet with any success. It appears that the causes are due to want of business acumen in the people who are at present conducting the affairs and to the greater expenditure incurred for establishments, etc.

Vigorous attempts should be made to bring weavers under a co-operative organisation. In order to stimulate such organisation and to enable the co-operative societies to supply raw materials at a cheaper rate and to dispose of finished goods advantageously, Government should make arrangements to give special concession in rates for transport of raw materials and finished products to and from certain specific places for a specific number of years, when certificate by officers specially delegated for the purpose, in the case of properly organised co-operative societies. It has been stated that this industry, which expanded considerably during recent years for causes best known to every body, is bound to get a set-back unless State help in the above shape or in some other form is forthcoming.

DINAJPUR DISTRICT.

Cotton weaving industry.

Cotton weaving is carried on mostly in the following places:—

- (1) *Khansama police-station*.—Khansama.
- (2) *Birgunj police-station*.—Debirbazar, Jharbari, Dangapara.
- (3) *Thakurgaon police-station*.—Gorea, Kesarbari, Baragaon.
- (4) *Baliadangi police-station*.—Jaunia, Shabazpur, Gohalgari, Khasiadanga.
- (5) *Ranisankail police-station*.—Bhandara, Ranisankail.
- (6) *Kotwali police-station*.—Raneegunj, Chinirbandar.
- (7) *Itahar police-station*.—Chabhote, Thibila, Jalligram, Namtar, Bhabanipur, Shahabhita, Dhansal and Bhorota.

The main centres of the industry are—Debirbazar, Jaunia, Shabazpur, Chinirbandar, Ranisankail, Khansama, Kesarbari and Borote.

The probable number of looms in the district will be 2,000 and there are very few fly-shuttle looms.

The industry is confined mostly to Hindu Tantis, Jogies and Polias; the number of Muhammadans is very limited.

About 27 per cent. of the weavers have additional income from cultivation or other business.

The yarn used is mostly English. Japanese yarn is used in some cases. It is procured from Calcutta by big yarn dealers and distributed to all places mostly through middlemen. Sometimes the weavers borrow money at a high rate of interest to purchase yarn or to meet expenses for family ceremonies. As a rule the weavers are encumbered.

The weavers generally work for 6 to 8 hours a day. The children and women assist them in setting up the warp and winding the bobbins in their spare time.

It may roughly be stated that yarn, both grey and coloured, to the value of Rs. 9 lakhs is consumed yearly in the district of Dinajpur for the manufacture of cotton fabrics.

Ordinary *kapas*, *photos*, *lungis*, *chadars* and *gamchas* are generally made. *Dhutis* and mosquito-curtain pieces are also woven in some places within Itahar police-station. Yarn of 14's to 24's is mostly used and yarn of higher counts up to 50 is also used to a very limited extent.

It may roughly be calculated that cotton fabrics to the value of Rs. 13 lakhs are annually manufactured in the district.

The finished fabrics are put in the market by the weavers themselves and by the middlemen in almost all important *hâts* of the district.

The most important centres of trade are Lahirihat, Bochagunj, Gorea, Khanshama, Raigunj, Dhonkol and Patiraj.

The average income of a weaver is only Rs. 15 per month.

The weavers of the district have not yet taken to fly-shuttle looms and their method of making warp is primitive. They do not make long warp and consequently they are required to make warp at short intervals. The people like to have heavy coarse goods which are consequently heavily sized. Considerable improvements can be effected in cotton-weaving in this district if arrangements are made to teach weavers to handle fly-shuttle looms, to make long warp by improved methods and to size yarn in shanks effectively in a simpler way. There is a considerable demand for this kind of locally made coarse fabric and the demand would be greater if the articles could be made cheaper. Almost the whole of the produce is consumed by the people of the district.

Jute spinning and weaving of coarse quality.

Jute spinning and jute weaving are carried on more or less throughout the district by the women members of the cultivators. This industry is carried on to a very limited extent by women members only and the income thus earned becomes their private fund. The spinning of jute is done on a frame something like the Monipur loom. The *chats* are brought by individual persons to *hâts* where they are collected

by the merchants. The principal *hâts* where these kinds of *chats* are collected are Lahirihat, Bochagunj, Fakirgunj, Kathihar Sibgunj and Alwar. There are three merchants of Lahirihat who collect this kind of *chat* to the value of 2 lakhs of rupees from that *hât* alone. It is reported that three merchants of Lahirihat and three merchants of Dinajpur town export this kind of *chat* to the value of Rs. 4,00,000 every year. The *chats* are sent to Calcutta where they are baled and finally exported to Bombay for packing cotton. Each *chat* costs about annas 8.

It is doubtful whether the makers of these *chats* make good profit but whatever is earned during their spare time is a gain to them. Moreover, in the majority of cases, the makers do not pay for the jute but produce it on their land. The male members do not grudge a little amount of jute taken by their female members to make a little income of their own. There is considerable doubt whether the people will invest something to begin with in order to improve the condition of the industry by having improved hand loom and hand spinning machine for the purpose, unless a number of such machines are distributed free by Government or by any organised party.

Chats of a little finer quality are also made for the purpose of meeting the local demands. They are used by the people for spreading and covering purposes. No estimate of its production could be made.

Finer kinds of *chats* are available at Dhonkol, Pathiraj and Sarai *hâts*. These *chats* are also made by the women members of the cultivators and are sold in *hâts*. They are used for spreading and covering. Spinning for such kinds of *chats* is done by Takku. A large number of these *chats* are made in many places within Raigunj, Kalia-gunj, Banshihari and Itahar police-stations. Most of these *chats* are used by the people of the home district. It is reported that a few are exported to Bihar.

Gur-making industry.

Gur is made from sugar-cane juice all over the district. It is made on an extensive scale in many places within the jurisdiction of Birgunj, Pirgunj and Patnitola police-stations. There are depôts of Messrs. Renwick & Co. and other firms at various centres. These firms hire cane-crushing mills to the cultivators. The mills hired are mostly 3-roller mills. Several families combine together to hire a mill between them and this system enables them to make the full use of the mill. A pair of bullocks are required to drive a mill. It is reported that when the bullocks are very strong about 60 per cent. of the juice can be extracted but usually about 50 per cent. of the juice is extracted. The juice is boiled in shallow iron pans and the pressed out cane stalks are used as fuel. Most of the *gur* produced is consumed by the people of the district. A portion is exported to Dacca and Faridpur by boat and to Rajshahi and Malda by carts. In one place within the radius of 6 miles there is an extensive cultivation of sugar-cane. The area under cultivation would be about 30,000 acres. The average outturn of *gur* per acre from the existing varieties is about 40 maunds per acre. The facility for transport is by carting. The place is about 15 miles from Dinajpur Town. There is a river within this area navigable for about 10 months in a year and the river may be made navigable throughout the year by slight dredging. The total production of *gur* is about 40,000 tons. The area

may be considered as the best place for any scheme for sugar refinery. An experiment may be made to crush the canes by mechanically driven mills which may increase the outturn by about 50 per cent.

No separate note is attached as it is a self-contained one.

Note on cotton weaving industry.

The cotton weaving industry is carried on in many places of the district. About 2,000 looms are in use and most of them are old country pit looms. The introduction of fly-shuttle looms has made no progress in the district because of the ignorance of the people to handle the improved looms. The creation of a peripatetic weaving school may help the introduction of fly-shuttle looms and will give the weavers chances to learn improved methods of making warp and sizing the yarn. If the weavers take to the abovementioned improved methods and looms, their production will be greatly increased. The District Board is making attempts to open up peripatetic centres in the district.

As to the question of co-operative organisation amongst the weavers the suggestions made in the note on the cotton weaving industry of the district of Pabna in paragraphs 3 and 4, page 99 are applicable in this case.

Note on the jute spinning and weaving industry.

Jute spinning and weaving is carried on by the women members of the cultivators, all over the district. There are two kinds of *chats* made. The coarse quality is intended for export to Bombay. It may roughly be estimated that coarse *chats* to the value of Rs. 4 lakhs are manufactured. It is reported that they are meant for baling cotton. Hardly anything could be suggested for the improvement of this industry unless cheaper and more effective looms are invented for making *chats*. The present *chat* weaving loom as demonstrated by the Government Weaving Institute (Serampore) is rather costly. The price with all necessary accessories comes to about Rs. 60 per loom, and this is a sum which is beyond the means of ordinary cultivators to invest for such purpose. This loom cannot at the same time produce fine *chats* of compact texture. As at present stands there is no possibility of such looms being taken up by the class of people who make *chats*. The loom should be made cheaper and more effective in its work if it is to be introduced amongst the weavers of *chats*. As to the spinning of jute the present spinning machine demonstrated by the Serampore Weaving Institute does not appear to me suitable for work by the class of people who are at present engaged in jute spinning. The spinning machine requires hackled and well prepared jute to work with. This hackling process necessitates the use of another hackling machine. Moreover, there is a wastage of about 12½ per cent. of jute in making well prepared and hackled jute.

The people cannot, under the present circumstances, face this loss which I believe will take away the greater portion of their profit. Besides the percentage of efficiency of the present machine is nearly the same as that of the *takku* or *charki* conducted by hand. Unless more efficient and durable spinning machines which can be used with unhackled jute, are invented there is no possibility of the improvement of this

industry. The industry is in a way quite organised and the people who do such work in their spare time make these *chats* when they find the work paying.

JALPAIGURI DISTRICT.

Cotton weaving industry.

Of the two important cottage industries of the district, the most important is cotton weaving which is being carried on mostly in the following places:—

- (1) *Sadar police-station*.—Paharpur, Balapara, Mandalghat.
- (2) *Titalya police-station*.—Titalya.
- (3) *Moynaguri police-station*.—Dharampur, Kristanagar, Ballirpara, Halpahree, Jorpahree, Patgram, Chengrabandha, Bholpati.
- (4) *Boda police-station*.—Kharija, Magura, Jatanpakree, Meerghar, Amtala, Kajipara, Jholia.

The great centres of this industry are—Paharpur, Titalya, Kristanagar, Meerghar, Ballirpara and Jholia.

The industry is mostly confined to the Hindu Tanti class; the number of Muhammadans engaged in the industry is very limited.

Twenty per cent. of the weavers have additional income by agriculture or other business.

The probable number of hand looms will be 1,750 and they are mostly old country looms. The fly-shuttle looms have not been taken up by the weavers of the district due to their ignorance to handle it.

The yarn used is mostly English. It is procured from Calcutta by Marwari dealers and then distributed to the weavers, sometimes directly and sometimes through other local middlemen. 14½'s to 24's yarn are generally used. Yarn of higher counts up to 50 is also used to a certain extent.

Weavers purchase yarn on credit from Marwari dealers direct. Sometimes they purchase yarn from local middlemen on credit on terms of repayment in cash or on condition of selling the finished product direct to the local middlemen, who are, as a rule, well-to-do persons of their own class. Sometimes the weavers borrow money at a high rate of interest to enable them to purchase yarn or to meet the expenses of occasional family ceremonies such as marriages, etc. The weavers generally work for 6 to 8 hours a day. The children and women assist them in setting up the warp and winding the bobbins in their spare time.

It may roughly be stated that yarn both grey and coloured to the value of 8 lakhs of rupees is consumed yearly in the district of Jalpaiguri for the manufacture of cotton fabrics.

Ordinary *photas*, *lungis*, *chadars* and *gamchas* are generally made. They are used by the local people, who use rather coarse fabrics.

It may roughly be calculated that cotton fabrics to the value of Rs. 12 lakhs annually manufactured in the district.

The finished fabrics are generally put in the market by the weavers themselves or through the middlemen in almost all *hâts*. The great centres of such trade are Boda, Pachagahr, Debigunj, Maynaguri, Titalya.

The average income of a weaver by cotton weaving is about Rs. 16 per month. The weavers are, as a rule, not better off than ordinary cultivators.

The weavers of the district still make their warp by *natai* and size the warp by stretching, which prevents them from making long warp at a time. The weavers are of opinion that sizing could not be made so good when it is done in shanks. The people are in favour of having heavily sized goods. Considerable improvements can be effected if arrangements are made to teach the weavers to handle fly-shuttle looms, to make long warp by improved methods and to size yarn effectively in a simpler way. There is a considerable demand for local made coarse fabrics and the demand would be greater if the fabrics could be made cheaper. The greater portion of the produce is consumed by the people of the district and the balance by the people of the Dinajpur and Rangpur districts.

Jute spinning and weaving industry.

Jute spinning and weaving is carried on to a certain extent by the women cultivators in the western parganas. It is done mostly by the people of Debigunj and Boda side. The *chats* are of coarse type and collected in *hâts* by middlemen for export. The merchants of Domar do a considerable business in this trade. The makers of these *chats* do this work during their spare time and whatever is earned during the spare time must be considered as a grain. In the majority of cases the makers do not pay for the jute which they take from their produce of land. The conditions are exactly the same as those noted down under this head of the industry of the district of Dinajpur and hardly anything could be suggested for its improvement for reasons which have been already dealt with in the note on the jute spinning and weaving industry of the district of Dinajpur, page 102 so no separate note is attached.

Note on cotton weaving industry.

Cotton weaving may be considered the only cottage industry of the district. It is extended over many villages all over the district. There are nearly 1,750 looms turning out cotton fabrics of coarse kind to the value of Rs. 12 lakhs.

The creation of a peripatetic weaving school will undoubtedly help the introduction of fly-shuttle looms and will give the weavers facilities to learn improved method of making warp and sizing the yarn. If the weavers take to fly-shuttle looms and adopt improved methods of warping and sizing, their efficiency of production will be greatly increased. The district is urgently in need of a peripatetic school for the benefit of the cotton weavers.

There are only six weavers' co-operative societies in the district but none of them has been able to conduct the supply of yarn efficiently. As to the question of co-operative organisation amongst the weavers the

suggestions made in the note on the cotton weaving industry of the district of Pabna in paragraph 3 and 4, page 99 are applicable in his case.

BOGRA DISTRICT.

Cotton weaving industry.

Cotton weaving is the only cottage industry of the district, other than silk weaving and is being carried on in several villages within the Sadar and Adamdighi police-stations.

The important centres of this industry are—

- (1) *Sadar police-station.*—Jogaipur, Dashtika, Somoil.
- (2) *Adamdighi police-station.*—Bamnigram, Lakshmikole, Saraswati, Mohonpur, Guṛamba, Muradpur, Kesharta and Satingaon.

*The great centres of this industry are—*Somoil, Dashtika, Bamnigram Lakshmikole, Mohonpur and Satingaon.

The industry is confined mostly to Muhammadan Momins. There are also some Hindu Tantis within the jurisdiction of Sadar police-station.

Almost all the Muhammadan weavers add to their income by cultivation.

The probable number of hand looms will be 450. The people have taken to fly-shuttle looms to a large extent. The number of such looms is daily increasing.

The yarn is procured from Calcutta by Marwari dealers and then distributed through middlemen. Sometimes the weavers purchase yarn from local *hats*. Yarn of 16 to 40 counts is generally used and yarn of higher counts up to 60 is also used to a certain extent.

The condition of the weavers here is much better than it is in the adjoining districts.

The women and children assist weavers in making warp and winding bobbins.

Dhutis, chadars, gamchas and lungis are made. The finished products are put in the market in local *hats*.

Cultivation is the primary occupation of the larger number of weavers.

There are five weavers' co-operative societies in the district but their work is that of a rural bank.

As to the co-operative organisation amongst the weavers for the improvement of the industry the suggestions made in the note on the cotton weaving industry of the district of Pabna in paragraphs 3 and 4, page 99 are also applicable in this case.

No separate note is attached as it is a self-contained one.

Silk weaving industry.

Silk weaving is carried on by 7 or 8 Hindu families of Malatinagar (Bogra Town). There are only 16 hand looms at work. The industry is

in a moribund condition. The weavers get their supply of raw material from Rajshahi fiature works and also from the Marwari silk merchants of Beldanga in the Murshidabad district. A weaver, with a helping hand, can weave about 4 to 5 pieces of cloth per month. Silk *saris*, *dhutis* and *chadars* are made. The approximate outturn of the place is about 5,000 yards of cloth annually, the value of which would be about Rs. 16,000. Formerly the business was very flourishing. The produce is entirely used by the people of the district.

Much improvement of the industry can be effected if fly-shuttle looms attached with dobby for border designs be introduced. It is expected that the weavers will have a greater margin of profit if they can produce more in a shorter time by taking to fly-shuttle looms in the place of the old country looms. The price of these goods has gone up very high due to the abnormal rise in the price of raw silk and the people can hardly afford to pay so high a price for a piece of cloth. Consequently, the weavers are compelled to sell their produce, keeping a low margin of profit. If the fly-shuttle looms can be introduced and if the weavers can effectively use them, it may give a fillip to the industry. A demonstration of silk weaving on fly-shuttle looms with dobby attachment will be soon given to show them the way.

No separate note is attached as it is a self contained one.

DARJEELING DISTRICT.

Cottage industries.

There is practically no cottage industry of importance in the district. Mention may, however, be made of cotton weaving and wool knitting.

(1) The knitting of coarse woollen socks and comforters (a long, narrow woollen scarf) is done by women. The census of the workers cannot be taken. The goods are available in the markets of Darjeeling district and are purchased by the people of the district.

(2) Weaving of coarse *chadars* and *laishampies* is carried on by Bhutea women and Terrai weavers to a very limited extent. The industry is in a very scattered condition and the number of people engaged throughout the whole district is about 277 only of whom about 140 are women. In view of its scattered condition no suggestion of improvement can be made except that attempts may be made for the introduction of fly-shuttle looms, but it is doubtful whether the people will take this up, as they will be required to learn the modern weaving technique, which is quite different from their existing method. The discontinuance of the weaving of cotton fabrics in the Kalimpong Industrial School shows the apathy of the people to take to modern methods of weaving.

Remarks of the Director of Industries, Bengal, on the survey of cottage industries by the Superintendent of Industries, Jalpaiguri Division, 1921.

The Superintendent has made a detailed survey covering the conditions of the principal cottage industries in the districts of Rajshahi, Bogra, Rangpur, Malda, Pabna, Dinajpur, Jalpaiguri and Darjeeling.

The principal industries concerned are—

- (1) Brass and bell-metal work.
- (2) Silk reeling and weaving.
- (3) Cotton weaving.
- (4) Cigar-making.
- (5) Tanning and shoe-making.

2. In regard to the very important brass and bell-metal industry of this division, apart from the demonstration work advocated by the Superintendent in his report (page 91) there is no doubt that a considerable impetus to this industry, requiring as it does mechanical hand-craftsmanship applied with the use of modern labour-saving tools and equipment, can be given if the industrial school at Rajshahi were developed into a competently staffed technical school, equipped with simple modern machines for mechanical work. With such facilities, actual demonstration and training can be given to these workers in casting brass articles as well as shaping bell-metal articles with mechanical hammers, and finishing the same with modern turning lathes and polishing equipment. Such methods would not be beyond the possibilities of application in small scale cottage factories if developed on co-operative principles in the present localities devoted to this work.

3. As regards the important silk reeling, weaving, and dyeing industry, apart from the demonstration work which can be done with the limited resources available to the demonstration party, there is no doubt that the next important step to be taken in regard to this industry is the establishment of a demonstration silk reeling and weaving school first at Berhampore and subsequently at Malda. Plans for such developments are only awaiting financial resources in order to put them into operation.

4. As regards the cotton weaving industry much has already been done, particularly in the locality of Nowgong, to develop the use of fly-shuttle looms and to recognise the workers on co-operative lines. The value of the assistance of the Industrial Inspector of Co-operative Societies located at Nowgong is apparent in the useful developments that have obtained there. It only remains for the Registrar of Co-operative Societies to expand this work in collaboration with the Industries Department, and where suitable opportunities occur these developments are being followed up.

5. The cigar industry in the Rangpur district is obviously ripe for further development and only requires confidence and training on the part of those immediately interested and concerned, to give the industry a satisfactory start, above and beyond the very small scale; but successful experiments have already been made at the Burirhat farm by the Agriculture Department. Plans for such a demonstration factory have already been worked out and submitted to Government but here again progress is hampered by the want of funds with which to put the scheme into practice.

6. With regard to the tanning and leather industry there is some scope for the demonstration of improved methods of chrome and vegetable tanning processes, as well as the manufacture of leather articles with suitable sewing and finishing machinery and equipment. An early

opportunity will be taken to give a demonstration on these lines by the tannery demonstration party as soon as the necessary arrangements can be satisfactorily made.

D. B. MEEK,

Director of Industries, Bengal.

The 25th June 1924.

5 CHITTAGONG DIVISION.

(Districts—Chittagong, Tippera, Noakhali and Backerganj.)

CHITTAGONG AND CHITTAGONG HILL TRACTS.

Weaving.

Cotton weaving.—The chief centres of the industry are Satbaria, Gasberia, Dolghat, Patiya (police-station Patiya), Katakali, Noapara, Madarsha, Fateyabad, Hathazari (police-station Hathazari), Mahmud-bazar, Dhemsha, Satkania (police-station Satkania), Mirsarai, Tetaiya, Janardanpur, Bamantala, Mahajanhat (police-station Mirsarai), Rangunia (police-station Rangunia) Cox's Bazar, Ramu and Chakaria (sub-division Cox's Bazar) and Chandrahona and Rangamati (district Chittagong Hill Tracts). The weavers are to be found scattered over almost all the important villages. Some of these weavers earn their livelihood entirely by weaving while others make it a supplementary occupation of agriculture.

2. The persons or castes of people engaged in the industry and chiefly subsisting on it are known as Tantis, Jogis and Jolas. The first two are Hindus and the last Muhammadan. But even amongst these classes the Jogis and Jolas do a certain amount of cultivation as a secondary occupation. The impetus given to weaving by the non-co-operation movement has succeeded in stimulating the industry to a great extent. As a result even the *bhadralog* classes have taken to it and have opened up small factories equipped with fly-shuttle and Hattersley looms. As many as 6 weaving factories and 14 schools were established last year in the district of Chittagong and the fly-shuttle loom has been rapidly introduced among the weavers who formerly used nothing but the indigenous throw-shuttle looms. It is estimated that the number of fly-shuttle looms now working in the Chittagong district is about 6,000.

3. The fine fabrics, produced by the Tantis, are woven entirely from imported yarns, while the coarser varieties are produced generally by the Jogis, Jolas and the *bhadralog* class from hand spun for the west and mill yarns in the warp. A noticeable feature of the hill people known as the Chakmas, Mongs and Bohmongs is that they spin their own yarns with the *charka* from cotton grown locally and weave it into cloth on looms made entirely of bomboo. It is said that about 14,000 of these primitive looms are working in the Chittagong Hill Tracts. It would be a difficult task to replace them by fly-shuttle looms as the latter looms could not easily be accommodated in the huts of the people nor would they be as portable.

4. The price of a fly-shuttle loom ranges from Rs. 45 to Rs. 50 and that of fly-shuttle pit loom from Rs. 20 to Rs. 25. But the looms used by the weaver classes cost not more than Rs. 10 or Rs. 12, on account of the fact that all the parts, with the exception of the sley, are made of bamboo and are constructed by the weavers themselves.

5. There does not exist any organisation for the supply of yarns to the weavers at whole-sale rates, nor has any provision been made for the sale of their products in the Chittagong districts, except at Zorwar-ganj where a yarn store has recently been started by the Department of Industries. Chittagong is at present exporting *khaddar* in large quantities. Binni cloth, made from cotton of a natural brown colour, is a speciality of this district, and the demand for it is constantly growing owing to the religious sentiments of the people attached to its use. The economic condition of the weaving classes has improved considerably, a whole-time weaver now earns from Rs. 20 to Rs. 25 per month whereas formerly his income hardly averaged Rs. 15.

6. The introduction of fly-shuttle looms, warping machines, and multiple shuttle sleys if more widely introduced would increase production to a considerable extent. In this connection it may be said that there appears to be a great future for the establishment of co-operative societies. The organisation of weavers' societies, and yarn stores for the supply of yarns to weavers at a cheap rate and the establishment of cloth depôts for the disposal of the finished products, would go a very long way to prevent profiteering by unscrupulous middlemen. The establishment of weaving schools in the larger centres of this industry, to teach the weavers improved designs, and the use of improved machines, will also benefit these industrialists very considerably.

7. *Silk*.—The chief centres of silk weaving are Cox's Bazar, Ramu, Teknaf, Maishkhali and Chalaria in Chittagong and Rangamati in the Chittagong Hill Tracts. Pure silk is not woven to any great extent, but the fabrics are generally inter-mixtures of silk and cotton. Fly-shuttle looms have not as yet been adopted at any of the above places for silk weaving. Some years ago Government at the request of the District Magistrate, Chittagong, established a weaving school at Cox's Bazar. The school was well attended by the Mug weavers, but although the women learnt the use of the fly-shuttle looms its adoption in the village was prohibited by the Mug merchants due to a rumour that was circulated that the Government intended to tax the people and to destroy the local silk weaving industry. When it was found that the women were forbidden to use the sley, and that those who had purchased them had destroyed them, the weaving school was removed to Zorwarganj where it is doing good work. The local *mahajans* import silk from Calcutta and elsewhere, collect cloths from the weavers, and then export them to Rangoon and Akyab. Instead of purchasing coloured silk as was formerly the practice, the merchants now buy ordinary silk, dye it themselves and then distribute it to the workers for weaving. Silk *lungis* are sold at Rs. 15 to Rs. 30 a piece depending on their size and texture. The workers among the Mongs are exclusively women because according to an old social custom with the Mongs, the obligation of discharging all the duties in connection with the maintenance of the family devolves on the females instead of the male. The workers accordingly can only devote their leisure time to weaving. The production of the looms is first utilised in clothing the family, but should there be any surplus material over,

it is sent for sale. Not less than a lakh of rupees worth of silk and cotton goods are manufactured annually by the Monges.

Cotton ginning.

8. There is a ginning factory at Chittagong managed by Messrs. Ralli Bros. They buy cotton from Chandraghona in the Chittagong Hill Tracts and other parts of Assam. After ginning and baling the cotton they export it to America. This cotton is short in staple, very harsh in feel and mixes quite easily with wool. It is in consequence greatly in demand, and Americans are regular buyers of it. About a lakh of maund of cotton is exported annually by Ralli Bros. Recently Mr. P. K. Sen of Chittagong established a ginning factory as an experimental measure with 3 ginning machines driven by power. He hopes to be able to increase the number of the gins as early as possible.

9. In addition to power ginners there are some men called Dalniwallas, Muhammadan by caste, who purchase *kapash* and gin it by hand-gins, locally called *charkas* or *kerkis*. These gins consist of two small wooden rollers one of which is actuated by a handle while the other roller, which is being mounted in bearings above it and in contact with it also revolves when the handle is rotated. Cotton to be ginned passes through the rollers leaving the heeds behind as the top roller is heavily weighed and in such close contact with the lower roller that the seeds cannot pass through and the cotton is consequently plucked from the seed. The hand gin has one advantage: the fibres are not so much injured as is done in power gins. Some of the Dalniwallas who chiefly live in the villages of Madarsha, Katakhalī Fatiyabad (police-station Hathazari) control a very large number of workers chiefly women, who devote their leisure hours to this work and are given in return, for their labour, the cotton seeds as wages. These Dalniwallas have in consequence become quite wealthy. A women worker in this way earns some thing like Rs. 4 to Rs. 5 per month during the working season which extends from December to June. It is said that about 8,000 workers are employed in the ginning of the crop which averages about 25,000 to 35,000 maunds of *kapash*, the approximate value of which is Rs. 2,50,000. This cotton is either sold at Chittagong or is exported to Calcutta.

10. The hand ginners would be greatly benefited if co-operative credit societies were organised to supply them with *kapash* on credit and if they were allowed a proportionate share of the profit after the cotton was ginned. The female workers who are as a rule ignorant seem satisfied with their small earnings which they spend on ornaments and clothing.

Spinning of fibres.

11. *Cotton spinning*.—Cotton is grown chiefly in the Chittagong Hill Tracts, and the method of cultivation is known as "jooming". A great part of the cotton after being ginned goes to America and Calcutta for sale while a portion of it is sold locally to the hand spinners. The chief centres of hand spinning are thanas Mirsarai, Patiya, Fatikchery, Satkania and Chakaria. The number of *charkas* working in the district is estimated to be about 20,000.

12. *Kapash* or cotton before it is ginned sells at annas 5 to annas 8 per seer and after being ginned and spun into yarns its price varies from Rs. 1-8 to Rs. 3-8 per seer according to quality. The average worker is generally able to spin about $\frac{1}{4}$ to $\frac{3}{8}$ of a lb. of cotton per day of 12 hours, the counts of which vary from 6's to 40's. The spinning of yarn is done chiefly by women and is sold in the open market at considerably lower prices than mill-spun yarns.

13. Chittagong is the chief mart for yarn. There is, however, no organisation for the sale of the commodity. The amount of cotton spun into yarn is difficult to estimate as the work is done by women in their spare time and the yarn spun is not marketed but is woven into cloth.

14. *Jute*.—About 50 families at Agrabad in the town of Chittagong are engaged in making ropes from jute imported from other districts. The workmen are chiefly Muhammadans. They devote only their spare time to this occupation. The men make the ropes while the women prepare the fibres previous to spinning. The earning of a family by this means, average about Rs. 180 per year.

15. The ropes made, generally consist of three strands. The strands are spun into lengths by means of revolving spindles placed horizontally between 2 bamboos and rotated by means of hand. The finished products are used in sailing vessels and there is a fair demand for these ropes. The better qualities are purchased by rope dealers at Chittagong at Rs. 30 to Rs. 40 per maund.

16. *Sunn hemp*.—Ropes and twines for fishing nets are the chief products made from sunn hemp. The fibre is first carded or heckled by drawing it over bamboo or iron spikes fixed vertically. It is then spun into yarn by means of rotating spindles. The work is generally done by men assisted by women and children.

17. The chief centres of this industry are Bardona, Rupkania, Madarsha, Jaliapara, Ratanpur and Khankhanabad within the Sadar subdivision and Chakaria, Teknaf, Kutubdia in the Cox's Bazar subdivision. There are about a thousand Hindu and Muhammadan families employed in this work during their spare time. The strings and twine are used in the manufacture of fishing nets.

18. As is generally the case with all cottage industries the *mahajan* monopolises the largest share of profits. He is the agent who imports the raw material from Calcutta, Dacca, Sitakund and other places, distributes it among the workers, collects the finished products, after paying the labourers only a nominal wage, and profits enormously by exporting the article to Rangoon and other places. The earning of the actual worker does not exceed Rs. 15 per month.

19. The Department of Industries is trying to improve the present methods of manufacture by introducing improved machines for spinning and weaving.

Fishing nets.

20. In addition to the local fishermen belonging to the villages of Juldi, Ratanpur, Khankhanabad (Sadar subdivision) who make their own nets, there are about a thousand Muhammadan families scattered about the villages of Satkania, Dhemsha, Madarsha, Bardona, Sonakania (Sadar subdivision) who supplement their primary occupation, *viz.*, agriculture, by making fishing nets. These nets are made either of hemp

twine or foreign thread spun into twine of 3 or more strands by an arrangement similar to a spinning wheel. These threads are sometimes sized and spun generally by men assisted by boys, but the making of the nets proper is generally done by women in their leisure time. Among the Muhammadans there are *beparis* or *mahajans*, who collect these nets from the actual workers to whom they sometimes supply thread, and export them to Rangoon. The following are some of the various kinds of nets used:—

The *phelan* is a small conical net of from 1" to $\frac{1}{2}$ " mesh used for catching prawns or small fry. It costs Rs. 4-8 to Rs. 5-8 according to size and quality.

The *hatua* or *tangya jal* is a larger *phelan*, costing Rs. 10 to Rs. 15.

The *balain* is a $1\frac{1}{2}$ " meshed net staked out in rivers for hilsa, etc. It costs Rs. 4 to Rs. 4-8.

The *patani* is a big 2" meshed net similarly used. It costs Rs. 18 to Rs. 20.

The *jhanki chhatki* and *dang* are casting nets costing from Rs. 2-8 to Rs. 14. The first has a $\frac{1}{4}$ " to $\frac{1}{2}$ " mesh and the other two a larger mesh varying from $\frac{1}{4}$ " to $1\frac{1}{2}$ ".

The *bar jal* is used for netting tanks and costs from Rs. 30 to Rs. 50 upwards. It has a 3" mesh.

The *dharma jal* is a small net suspended from a bamboo and dropped into pools and khals to catch small fry.

The *ber jal* is a big sieve, costing from Rs. 100 to Rs. 150.

The *behandi jal* is a big stake net of 3" mesh. It costs Rs. 250. It is used on sand-banks for sea and river fishing.

The *phanda jal* is a long narrow net used to catch *phanda* fish. Mesh $1\frac{1}{4}$ ".

The *tana jal* is a drag net worked by 2 men, its mesh is $1\frac{1}{2}$ " in size.

Carpentry.

21. There are about twenty cabinet-making establishments in Chittagong each employing about 10 to 15 men whose pay ranges from Rs. 20 to Rs. 30. The timber supply is obtained from the Hill Tracts and Rangoon and the manufactured articles, though of superior quality are inferior in finish compared to the Calcutta product. Wood carving is also done by some of these carpenters and for such work they generally use Gamar or Jarool, Chambel and Narkuli wood. The total value of the finished products per year averages a lakh and a half. The village carpenters who are mainly agriculturists, manufacture doors, carts, cart-wheels, ploughs, *dhenkis*, ordinary tables, chairs, almirahs, etc., and earn about annas 8 to annas 12 per day.

Boat building.

22. Boats, of which the sampans constitute the principal variety, are extensively built in Chittagong. The chief centres are Ashurasta in Chittagong, Kalarpole on the Nyaphari channel and the villages on the

banks of the Sankha and Halda rivers including Kolagaon and its adjoining villages. Dug-outs and Kondas are generally built in the Chittagong Hill Tracts and are exported from there to Chittagong and Noakhali. The other varieties of boats built are—

Chota Saranga.—This is a dug-out costing Rs. 25 to Rs. 30 and carrying up to 8 maunds. This boat is paddled by one man.

Bara Saranga.—It is a big dug-out roofed with bamboo matting, it carries 100 maunds, costs Rs. 140 and requires a crew of 3 men. It is chiefly used for traffic in the canals and shallow water.

Bharutya.—It is rather bigger than a *saranga* and has a moveable roof. It carries 100 to 150 maunds and costs Rs. 160. It requires three men to propel it.

Ad balam.—It is a larger dug-out with plank bulwark fastened to the side with cane. It carries from 150 to 200 maunds. Costs from Rs. 180 to Rs. 200 and requires a crew of 5 men.

Gadu.—It is larger than the *ad balam* although similar in construction. It carries from 200 to 300 maunds. It costs from Rs. 250 to Rs. 300 and requires 7 men.

Balam.—It has an extra plank along each side and carries from 200 to 300 maunds. It costs from Rs. 250 to 300 and requires 7 men.

Jalyano.—It is larger than the *gadut*. It is used for deep-sea fishing.

Besides wood a special variety of cane called Bhudun, which is found in Arracan and Ramu (Cox's Bazar subdivision) also forms a valuable raw material for boat building. It is sold at Rs. 2 for 100 split pieces each 9 feet long.

23. Boats of different sizes costing Rs. 1,60,000 roughly, are constructed annually in Chittagong.

Ship buildings.

24. Ship building is an ancient industry of the district. The carpenters who are considered to be expert at ship building, belong to a hereditary class of Sudras (Hindus) and are inhabitants of Goashaldanga (police-station Double Moorings). Some Muhammadans have also taken up this profession. Madhab, Kalikumar Mistry, Fakir Mahmamad and Makboal Saodagar are reported to be the best experts in sloop building. In all there are about 200 families, scattered along the banks of the Karnafuli from Chaktai to Halisahar, who are reported to be expert shipbuilders. The workers earn Re. 1 to Rs. 5 per day of eight hours according to their skill.

25. Before the building of a brig is undertaken the design is marked but on the ground and a small wooden structure with ribs, keel, etc., is set up. The construction is performed in different stages as stated below:—

(1) Carpentry and wood work.

(2) Caulking which consists in the setting up of ridges and the filling up of gaps, etc.

- (3) Mast and sail making.
- (4) Sheeting with copper and brass.
- (5) Ornamental works, such as the setting up of glass panels, construction of cabins, etc.
- (6) Varnishing and painting.

The building work for a moderately large brig which invariably commences on an auspicious day, takes about six months to finish employing in all some 150 to 200 hands working 8 hours daily. A fairly large number of boys are generally employed on the work for the purpose of helping as assistants.

26. The launching ceremony is a matter of much concern with the owner as it is considered unlucky if the brig gets stuck up or damaged on its way down to the river.

27. These vessels sell readily in Bombay, Ceylon, Malabar Coast and Coconada. Some of the merchants of Chittagong also get sea-going vessels of various capacities built from time to time either for themselves or for sale. These vessels or brigs are used as cargo boats and during the last three years several such were constructed and launched. The following are the firms for whom the vessels were manufactured:—

- (1) The firm of A. R. Dubhash.
- (2) Messrs. Sonatan Nityañanda Roy.
- (3) Messrs. Krishnadas Umarchand Roy.
- (4) Messrs. Jugalchandra Brojendrakumar Roy.

The registered tonnage of these boats varied from 89 to 646. The largest vessel, *viz.*, one of 646 tonnage was built for Mr. A. R. Dubhash and is known as the "Star of Chittagong." It was launched in 1918. It is reported to have cost about Rs. 60,000 and was sold for Rs. 80,000.

28. Improvements in the manufacture of these vessels were suggested by the Shipwright Surveyor, Chittagong, who was given a sum of money by the Department of Industries, Bengal, for constructing the model of a ship and demonstrating its superiority to the local boat builders. The model was much appreciated by the shipbuilders, but no steps seem to have yet been taken to adopt the improvements suggested.

Loom manufacture.

29. Looms being now-a-days much in demand, their manufacture is forming a profitable occupation for many carpenters. At Zorwarganj shuttles and bobbins are also manufactured from a kind of wood called Kanak and these find a ready sale.

Bamboo.

30. The chief centres of the bamboo-mat industry are the villages in Satkania Khas Mahal, Gaurisankar *hât*, Charati, Narain's *hât*, Fakir's *hât* and Lambor *hât*. It thrives as a cottage industry on either side of the Dolu river in Chittagong.

31. The mats, woven with finely split bamboos can be made to any desired size. The ordinary specimens known locally as *chattais* and

dharis generally measure 36" by 54" and 54" by 90", respectively and are sold for 3 annas and 5 annas per piece. They are collected from house to house by merchants and are exported to other districts, Burma and foreign countries for dunnage in ships. The value of the goods yearly produced comes to about Rs. 10,000.

32. The hill people of Chittagong and Chittagong Hill Tracts are also clever in basket making. The baskets are extensively used in packing cotton and grains for export from Chittagong and Chittagong Hill Tracts. The cultivators utilise their leisure hours in making baskets, *lais* and *chalanis*, etc.

Umbrella handles.

33. Bamboo umbrella handles are manufactured in a factory at Sitakund. The bamboos are collected from Chandranath and other neighbouring hills and are supplied to the factory at Rs. 1-8 per thousand, the royalty charged by Government is paid by the factory. Formerly raw bamboo sticks (locally known as Bazali or Molai) were exported in large numbers to Calcutta for the making of umbrella handles from the Mirsaraj hills, Chittagong.

34. The sticks are first selected and classified according to grades. The sticks are next straightened, by heating them over a fire, cleaned and smoothed by sand papering. One end of the stick is then filled with sand and closed with cow-dung previous to bending it. An iron instrument made in the form of the crook of an umbrella is then heated and the stick is placed over it and is gradually bent into the required form. The heated iron, chars the bamboo on the inner side and the fibres contracting from the crook. The loose end of the crook is then tied to the stick of the umbrella to prevent it from straightening out until it cools down and sets properly. The subsequent processes are the sand-papering, marking and the polishing. The marking is done by burning marks on the bamboo with a blow-pipe flame. The final process is the varnishing which is done with shellac varnish. The working season extends from February to August. Three to four gross of handles are made daily. The wholesale price of a gross of handles of assorted sizes is Rs. 10.

35. The factory employs about 15 to 20 men, who are paid on the contract system. Their wages vary from Rs. 15 to Rs. 45 per month according to the work done by them. With the training of the local people in the industry, the necessity of importing workmen from Calcutta which was formerly the practice has been dispensed with.

36. Cane walking sticks are also manufactured at Sitakund from a special kind of cane which is sold at Re. 1 to Rs. 2 each. Raw canes are also collected by the local people from the forests and are sold at annas 4 to annas 8 each. Some of the villages under police-station Patiya are also centres of the industry. These canes are to be found in places up to the Sankha river. They are polished, fitted with brass ferrules at both ends and are sold at annas 8 to Rs. 1-8 per stick according to the size and thickness of them.

Reeds.

37. Excellent mats, known as *Sital patis* are made from reeds called *Paitra* (*Phurium dichitranim*) which grow abundantly in damp places

near Satkania, Narain's *hât*, Lambor *hât*, Raozan and Nila in Chittagong. The prices of these mats which are generally (7' x 5') vary from Rs. 1-2 to Rs. 6 according to quality. *Sital pati* mats find a ready market in Burma, Calcutta and other places.

Sola.

38. The workers usually belong to the Malakar or Mali class of Hindus, who have acquired the hereditary or exclusive privilege of manufacturing garlands, etc., for ceremonial use in Hindu marriages from sola. The plant grows in water up to a depth of six feet. The thicker portions of the stem to a length of 2' to 3" from the root are cut off. The pieces are then tied into bundles and stored until dry. After removing the bark, the pith is cut into shapes as required. It is sometimes peeled into thin sheets, not much thicker than note paper by means of a knife. During the Muharram festival decorations are made of this pith and used on the tazias.

Kurup.

39. Umbrellas are manufactured from the leaves of a plant locally called Kurup which is available in Chakaria. Of the two varieties manufactured, one is fitted with a straight bamboo handle and the other called Jongra has no handle but is shaped conically to fit the head and serves the purpose of a hat. The manufacturers are generally Muhammadans. Kurup leaves are exported to Daulatganj and Noakhali where they are made into umbrellas and the finished article sells at Rs. 1-8 to Rs. 2 according to quality. About Rs. 5,000 worth of these leaves are sold annually.

Blacksmithy.

40. The village blacksmith, an indispensable entity in villages is responsible for the manufacture of agricultural implements and other household articles and owing to the nature of his work it is unaffected by foreign competition. He earns on an average Rs. 15 to Rs. 25 per month. Some blacksmiths of Chittagong manufacture dies, bolts, nuts, etc., and do ordinary repair work. Occasionally steel trunks are also made by them but owing to the superiority and cheapness of the imported article, they are not much in demand.

Number of employed men in this industry is about 300.

41. There also exists an iron foundry and engineering workshop at Chittagong fitted with some machinery driven by an oil engine. Orders for sugarcane crushers and repair work of sorts are executed at this factory.

Tinsmithy and repair workshop.

42. Tinsmiths who are found in every mufassal place of importance turn out ordinary lamps, jugs, etc., by utilising kerosine oil tins. A factory also has been established at Chittagong to manufacture buckets from corrugated iron sheets, wall lamps and other petty brass articles. The average monthly income of a worker at this factory is about Rs. 18.

43. *Brass*.—There are eight shops at Chittagong employing in all about 40 men, which manufacture brass *hukkas* by remelting old brass articles. The finished articles sell at Rs. 2-8 to Rs. 2-12 per scer. The

finishing and polishing, etc., of the *hukkas* is done with files and on crude hand power lathes. The *hukkas* are a speciality of Chittagong and find a ready market locally and are also exported to other parts of Bengal.

Hide curing, tanning and leather goods.

44. *Hides*.—Hides are exported to a large extent to Calcutta, Dacca and Burma. The more important hide centres are Panchalaish, Bibirhat and Amjarbag where about 40 merchants are to be found who collect hides from slaughter-houses or from individual dealers and cure them with salt. The wet salted hides called Meshki sell at Rs. 15 to Rs. 20 per maund, while dry salted ones at Rs. 25. The market, however, fluctuates from day to day.

45. *Tannery*.—The most important centres of tanning are Jorwar-ganj, Chittagong and Raozan. There is no regular tannery to be found in the district and the ordinary tanning work that is undertaken is done by isolated groups of Rishis, Chamars and Moochis, the former two classes being inhabitants of Bengal and the latter of up country. They are more or less self-supporting. The liming process takes some 15 to 25 days and the deliming for which rice gruel is mostly used, takes some 6 to 10 days. The tanstuffs used are Sonaloo, Kerfa, Goran bark and Myrabolans, etc., and the whole process takes about 2 to 3 months. The tanning demonstration given by the Department of Industries, Bengal, at Chittagong was much appreciated by the local Chamars and some of them have actually taken to chrome tanning.

Number of men employed in this industry is about 150.

46. *Boots and shoes*.—Boot and shoe making is done on factory lines at Chittagong. In factory at Anderkilla in the town of Chittagong, the *moochis* employed earn Rs. 15 to Rs. 25 monthly. The leather is obtained from Calcutta. At Chittagong, local Chamars make rough shoes and slippers from bark-tanned leather for the use of the poorer classes.

Pottery.

47. The industry employs a large number of people in the district. The chief centres are Bibirhat, Kalipur, Satgar, Kadalpur, Bajalia, Hali-sahar, Mirjapur, Kusruskhul, Teknaf and Maishkhali, where cooking pots, water jars, tobacco pots, *hukkas*, etc., are manufactured. At Bibirhat rough earthen tea cups are also made. A potter earns on an average about Rs. 12 to Rs. 15 per month.

48. Bricks are manufactured at Bibirhat, Nasirabad, Dampbara, Sitakund, Bhatiyari. At Bibirhat in Chittagong, there are about 20 families engaged in making ordinary tiles. The finished product is not of good quality but finds a ready sale in the neighbouring villages. The workers are all Muhammadans and are primarily agriculturists.

Tailoring.

49. There are many tailors in Chittagong. They may be divided into two classes—

- (i) Those making garments, etc., from cloths supplied by the customers.

- (ii) Order suppliers— those who make garments on order from the stock of cloth kept in their shop.

Both classes of shops employ a master tailor and a few paid tailors at monthly salaries varying from Rs. 20 to Rs. 35. Cutters are also employed in some of the big shops who are paid at the rate of Rs. 50 to Rs. 60 per month. The income of a master tailor who keeps a shop varies from Rs. 50 to Rs. 100 per month. There appears to be no system of home work in these shops. Most of the tailors are local Muhammadans who come to their duty at 8 or 9 A.M., and sometimes work up to 11 P.M., according to the pressure of work. There are also a few such shops owned by Hindus who are mostly men from other districts. In most of the shops Singer's sewing machines are used and they are obtained generally on the hire-purchase system. The garments made at these shops are shirts, coats and punjabis. The sewing charges of which vary from annas 8 to Rs. 2, while special orders are executed according to the material used. Five to six hours are required by a tailor to make a shirt or a punjabi. The rent for each shop varies from Rs. 10 to Rs. 25 a month. The second class of tailors, i.e., the order suppliers, get their cloths from local Marwari shops, where a big stock of cloths is always kept. A would-be tailor receives his training in one of these shops. He is generally apprenticed to a shop either owned by a relative of his or where his relative is employed. When he has learnt something of his trade he is either employed in the same shop on monthly wages or if he has got the necessary capital he opens a new shop. The result of this practice is that the tailoring business is continually extending in the district and is employed an increasingly large number of men. During the paddy harvest time some of the Chittagong tailors of ordinary merits go to Akyab with their machines for 3 or 4 months to make up clothing for those who go there to cut paddy, etc., and thereby earn quite decent amounts. This sometimes causes a shortage of tailors even in the town shops. There is yet another class of tailor who lives in Haldarpara near Chakbazar in Chittagong. They carry on their work at their own houses. They generally make plain Nainsook or Khaddar caps with or without embroidery—the embroidered cloth for these caps is imported from Delhi and other places. They do not keep any regular establishment. They do the sewing, etc., with the help of their family members. These caps are consumed locally. Some are also exported to Noakhali and the southern parts of Tipperah. Each cap is sold at 1 anna 6 pies to 2 annas, the cost of cloth for each being 6 to 9 pies. The whole village practically consists of tailors of this kind, there being about 100 to 150 families subsisting on this particular work.

Chemical industries.

50. *Sati*.—This is a kind of food prepared by pulverising the roots of the *sati* plant. The plant is found in abundance all over the district. In many houses a small quantity of the food is prepared, but in such cases the roots are not wholly utilised. The process of manufacture in use is as follows:—

51. The roots are collected and washed. The outer skin is peeled off with a knife and it is then rubbed against the rough side of a piece of tinned iron. (The roughness is produced by piercing the piece of tinned

iron with a nail.) The pulp thus made is placed in a vessel with sufficient water and stirred thoroughly. The fibrous matter is separated by filtering the mass through a piece of cloth. The water is allowed to remain in the vessel along with the pulp and the sediment is separated by decantation after a day. The process of washing is repeated until the bitter taste disappears. The food is sold in the market at annas 6 to annas 8 per seer . As the industry is not profitable and the process is tedious it is practised by women in their leisure hours during the winter season. There was a factory at Chittagong which used to make *sati* food by pulping the roots by means of a disintegrator and causing water to circulate through the mass during the time of pulping by a force pump. The machinery was driven by an oil engine. The factory could not continue the work for want of a regular supply of raw material, though the industry appeared to be a profitable one. To keep a factory working, large quantities of raw material is needed but as this plant has not as yet been cultivated the collection of the roots is a difficulty and so the industry can only be carried on on cottage lines. The *sati* plant grows abundantly in a wild state, and is to be found in almost every village.

52. *Soap*.—Soap is manufactured only at Chittagong in this district. There is a small factory in the town of Chittagong known as the Islamabad Soap Factory, which makes washing soaps and inferior qualities of toilet soaps. Five men are employed in this factory on a monthly salary of Rs. 15 to Rs. 20 each. It is gradually enlarging its business and is said to be doing well.

53. *Paper*.—There is a village by the name of Kagjipara in Patiya thana in the district of Chittagong, where paper making is still being carried on by a few families as a supplementary occupation though in former days almost all the villagers were fully employed in this industry. The papers made by them were of very inferior quality but they were used by Government, the zemindars and the schools as they were never touched by book worms. Some of the documents written on these yellow papers in 1200 Magi Survey (1839 A. D.) are preserved in the collectorate record room and are still in good condition. With the introduction of machine made papers of various kinds, this cottage industry has practically died out. Only a few men in the village are now making papers which are used in making kites and book covers. Some local zemindars, however, use these papers now and then in their offices. In the village there are only 10 to 15 men who can do the work well. Five or 7 men working for 8 hours a day can make 100 sheets of paper. Kite papers are sold at about annas 4 per quire and annas 8 per quire of yellow paper.

54. These rough yellow papers are now made from sunn hemp which is purchased at Rs. 12 to Rs. 20 a maund according to quality. The supply of this raw material is got from the neighbouring villages. The fibres are cut by hand mixed with lime and then pounded in a *dhenki* and reduced to pulp. The pulp is then put into bamboo baskets which are dipped into a tank containing water. The pulp is trampled by workmen and reduced to powder which then finds its way through the meshes of the baskets into the water. The water is next agitated and it becomes turbid. The pulp is gathered on a bamboo sieve in sheet form and is then placed on a smooth block of wood. The sheets are then separated and dried in the sun. The process is a very tedious one and requires a good deal of skill. The paper is polished and dyed. For polishing the

sheets are rubbed with a piece of stone soaked in mustard oil. For yellow colour they use sulphide of arsenic (*harital*), the proportion being 1 tola or $\frac{1}{2}$ oz. for a quire of paper. The arsenic is mixed with rice gruel and the papers are soaked in the solution and dried. Women and children also assist in the above operations. There are some women who unaided by men can perform all the processes. About 8 seers of rice gruel or starch is required for every 100 quires.

55. *Safety matches*.—There are 3 factories in this district, one at the town, one at Binajuri in Raozan thana and the other at Patiya where the manufacture of matches by hand machines invented by Dr. Nandi of Tippera is carried on. The total daily outturn of these factories is about 7 gross and the selling price is at Rs. 1-15 per gross.

56. The price of the machine is Rs. 450. These machines are made at Kalikacha as well as at the Pioneer Match Factory's Work at Comilla. All three match factories are said to be working at a profit.

Sugar making.

57. *Cane*.—Sugar is not manufactured in this district, but molasses or *gur* is made. The chief centres are Sitakund, Bariyadhala, Mirsarai, Dhoom, Rangunia and Kundehat in Chittagong. The three-roller crushing machines with iron rollers are gradually replacing the indigenous sugar-cane crusher which consists of two long wooden rollers mounted vertically and geared into each other by threads cut at the top of each roller. One of these rollers is made to revolve and the other being geared to it also does likewise. The sugar-cane is passed, between the rollers and crushed and the juice which is thus extracted flows into a receptacle. It is then boiled and allowed to cool. Messrs. Renwick & Co. of Kustia have got agencies all over Eastern Bengal and supply crushing mills to the cultivators on hire at Re. 1 to Rs. 1-4 a day.

Oil pressing.

58. *Kolus* or oilmen are scattered all over this district. They extract oil from mustard and til seeds with the country made *ghanis*. Locally produced oil is always preferred by the people to mill-made oil but the former cannot compete with the latter as the cost of production is greater. Chalmugra and castor oil are manufactured at Chittagong by Mr. P. K. Sen with a hand hydraulic press. There is also a steam driven oil mill at Chittagong.

Possibilities of new industries in the district.

59. There is a great possibility of starting a tannery at Chittagong. Hides are exported in large quantities from the port of Chittagong. Tanning material is available in the forests and there is a good market for leather at Rangoon. If a tannery with up-to-date machinery is opened here, there would be no difficulty in the disposal of the finished hides and leather goods.

60. Raw materials for paper pulp, such as Ekra grass, bamboos and nals, etc., are available in large quantities in Chittagong and the possibilities of establishing a paper mill here are very favourable.

61. At Chandraghona and in the Chittagong Hill Tracts there are no factories of any sort. Earthenware, tin and iron utensils are imported from other districts. These industries could be profitably carried on at Chandraghona and Rangamati.

62. Small weaving factories with power looms could be established with advantage in the important centres of the district.

63. *Fruit canning.*—Good pineapples are available in large quantities in Chittagong and the Chittagong Hill Tracts. An attempt should be made to establish a fruit cannery here.

BACKERGANJ DISTRICT.

Weaving.

64. *Cotton.*—The chief centres are Gabkhan, Kirtipasha, Uzirpur and Jhalakati in Jhalakati thana, Nyiamati in Patuakhali thana, Siddakati and Nalchity in Nalchity thana, Banoripara and Baisari in Pirojpur subdivision, Madhabpasha in Barisal. Fine cloth is woven at Uzirpur, Banoripara and Siddakati. The weavers of Madhabpasha make mosquito nets both white and coloured and have earned quite a good reputation for themselves among the middle classes. The Mugs of Khepupara also make a coarse cloth for their own use on their primitive looms. Three or four factories have been started at Barisal with fly-shuttle looms and one of them is working very well.

65. *Jute.*—There is a class of people called Kapalis who weave gunny bags from jute. The most important centre in Backerganj is Gournadi at which there are about 25 villages. The other important centres are Patihar, Chandshi, Janglapatti, Barthi, Tarakupi, Despatti, Satla, Billagram, Chotadulali, Katakasthala, Ila, Gorakshadubi, Sarifabad, Bagshirhal, Dumuria, Boisha, Khanjapur, Shaora, Hafania, Kumardaba and Murihar. These villages contain about 740 families. The Kapalis get their supply of jute locally while a few grow their own jute. They are Hindus by religion. There are *mahajans* also who help them with money on interest. Bags larger than 27" by 72" in size cannot be made on their looms, which are very primitive and the method of weaving is very slow. Gunny making is not the primary occupation of the Kapalis. This jute weaving is done by the women also in their leisure hours. The industry has long been in vogue among the Kapalis, but as the profession is not a paying one the Kapalis have also taken to agriculture. A loom does not cost them more than Rs. 2-8 to Rs. 3. Each bag requires $\frac{3}{4}$ seer of jute and the production does not exceed one bag per day of 10 to 12 hours. Three or four bags are sold for Re. 1. Thus the average profit of workers does not exceed more than annas 2 to annas 3 per day of Rs. 5 per month. By the effort of the Department of Industries, some improvement has been effected in this industry. Improved spinning machines have been constructed and their working has been demonstrated among the Kapalis in the Backerganj district. Improved looms have also been made and worked among them. The Kapalis appreciate the machinery and efforts will be made to introduce same among them.

Spinning of fibres.

66. For the purpose of weaving gunny bags the Kapalis spin the jute by means of the *takko* or spindle. One seer of jute can be spun in

a day. In Backerganj jute ropes are manufactured to some extent and sold locally. A hand-spinning machine has been devised by the Department of Industries and demonstrated among the Kapalis who appreciate it very much.

67. If the demonstration of jute spinning and weaving is made at all the centres of jute cultivation in this district and the Kapalis are induced to adopt improved methods, there is no reason why these people should not be able to supply the local demand for rice bags, etc. There is enough scope for the formation of co-operative societies among the Kapalis and they are disposed to join them.

68. *Coir rope*.—The prisoners of the Barisal central jail make coir ropes from cocoanut fibres. The Home Industries Association, Barisal, which has been recently organised have directed their attention to this industry. A small business has been made by establishing an experimental coir rope factory at Barisal and it is expected that with the efforts of the association and local assistance some good will result.

Carpentry.

69. In Backerganj the carpenters are mostly Namasudras by caste. There is a saw mill at Jhalakati which makes planks for packing cases from Gaoa wood for export to Calcutta.

Boat making.

70. In the Backerganj district a good deal of boat building is done, especially at Debaikhali and Syampur in Mehendiganj thana and at Ghanteswar near Agarpur. Large cargo boats are constructed at Barsakhali and Sohagdal. Dingi boats are built all over the district and specially at Jhalakati. The Mugs also make hollow canoes out of Keora wood.

Reeds.

71. The Paitryas of Jhalakati thana, and Helencha and Rangasri in Backerganj thana are well known for weaving pati. The workmen are called Paitryas in Backerganj. They are Hindus.

72. Coarser mats are made in the district of Backerganj from a reed called *Nal* (*Arendo Tapalis*). These are locally called *Chas* and are sold at annas 10 to annas 12 a piece. These are also exported to other districts. Besides their ordinary use, the mats are also utilised as dunnage for boats. The subdivision of Pirojpur and Patuakhali are important centres.

Hogla.

73. This is a char reed from which a rough mat is made. It is used by the poor as bedding. Hogla matting is a special product of the Backerganj district and is made throughout the district. Jhalakati does a special trade in it and it is exported to Calcutta and other places. That mat is made of different sizes and sold at annas 4 to annas 12 each. It is also utilised in the making of bags for exporting dried fish. A man

can earn from annas 2 to annas 6 per day. The weaving of these mats is generally done by women in their leisure hours and is a supplementary occupation.

Fans.

74. Fans are made from palmyra leaves. Jhalakati and Barisal in the Backerganj district are important centres. These are sold at 15 to 20 per rupee and it is said that about 1,000 men are engaged in this industry.

Ketaki or Kea (screw pines).

75. It grows extensively in a wild state all over the district. The Mugs of Khepupara make a kind of mat and a basket of it.

Blacksmiths.

76. High class cutlery is made at Uzirpur and Barapaika in Backerganj. The blacksmiths of Patuakhali and Nalchiti also make quite good cutlery. Special saws for the cutting of conch shells are made at Uzirpur. There are about 6 families employed in this work only.

77. There is a shop at Barisal making an inferior quality of steel trunks. There is not much of a market for these articles.

Horn work.

78. In Backerganj, this industry is carried on to some extent. The chief centres are Barisal, Bhola, Amtali, Patuakhali and Galachipa. The workers are all Muhammadans and come from Dacca. They get their supply of horn locally as well as from Dacca at Rs. 10 to Rs. 12 per maund. The artisans purchase 2 to 3 maunds of horn at a time. Fifteen to 20 maunds of horn are consumed by each shop in the year. Seven or 8 seers of horn are required for 40 combs which are sold at annas 4 to annas 5 each. Two to three days are required to make 40 combs. The shavings of the horn are sold at Dacca at Re. 1 to Rs. 1.4 per maund. Difficulty is experienced in the process of manufacture in the sawing and cutting out of the horns. The teeth of the combs are cut by sawing. The polishing is done by scraping. The men work very hard, from early morning till 8 o'clock in the night. The average daily earnings of a man varies from annas 12 to Re. 1 according to season and the demand for the goods.

Lime.

79. Jhalakati is a well known market for lime. This is made by burning shells found on the river side.

Tanning and leather goods.

80. Tanning is done to some extent at Barisal and at Nalchiti by the local Chamars, according to indigenous methods.

Pottery.

81. The chief centres of this industry are the thanas of Nalchiti, Gournadi and Mehendiganj. There is a brick field at Barisal. The potters who are Kumbhakars by caste earn a fair amount of money by the making of images of Hindus gods.

Safety matches.

82. A factory has recently been established at Barisal for the making of safety matches. It is equipped with a Nandi's machine. The outturn of the factory is about 4 gross a day.

Fish oil.

83. The fishermen of the Barisal coast, Nalchiti, Chandramohoner char and Kaliganj in the Backerganj thana manufacture oil from sharks caught by them during the rains. The yield is from 5 to 10 maunds a month during the months of July to October. The oil is prepared in a crude manner by boiling down the liver of the fish in an earthen jar or an iron pan. A co-operative society, if formed among the fishermen, would work excellently. There seem to exist great possibilities for the improvement of this industry.

Gur making.

84. *Gur* from cane is made in this district specially at Muladi, Gournadi and the Backerganj thanas. Some of the manufacturers use three-roller machines which they get on hire from Messrs. Renwick & Co.

Date.

85. *Gur* from date juice is mostly made in Backerganj. The *patui gur* of Gabha, Banoripara and Gournadi thana is well known in the district.

Oil pressing.

86. Coconut oil is manufactured at Bhola, Amani and Nalchiti. There are two oil mills in the district, one at Jhalakati and the other at Bhola. The oil mills if managed and worked properly should pay well as the raw material is plentiful and it can be had at very favourable prices.

Rice husking.

87. Rice husking is done by means of *dhenkis* in almost all the villages of the district. There are three rice mills—two at Jhalakati and one at Jirakati. They are driven by power. Engelburg hullers are used.

Hosiery.

88. There are 4 hosiery factories in the district chiefly employed in making hose. Two of them are at Bhola, one at Patuakhali and another at Barisal.

Possibilities of new industries.

89. Coconuts are available in abundance in the district. The manufacture of coconut oil and coir rope could quite easily be taken up as the conditions are most favourable for their success.

TIPPERAH DISTRICT.

Weaving.

90. *Cotton*.—The chief centres of cotton weaving are Mainamati, Tantipara (in the Brahmanberia subdivision) and Kalikapur, Gunabati and Jukaran in the Sadar subdivision of the district.

91. *Mainamati*.—About 300 families are engaged in weaving fine cloths. Checks of various patterns suitable for *lungis*, shirts, punjabis and suitings are made here. Mosquito nettings and *Jam saris* of fairly good quality are woven at this place. The weavers are also acquainted with twill weaving and some of them know the weaving of fine and thin cloths.

92. In Tantipara there are about 40 families who weave fine cloths from imported yarns—*tanjabs*, *trandams*, *pugris*, *chadars*, *dhutis* and *saris* are the chief products of the looms. These fabrics are exported to Dacca and are sold there as Dacca cloths.

93. The weavers of Sarail and Kalikacha in the Brahmanberia subdivision make *dhutis* and *chadars* of good quality and sell them from Rs. 20 to Rs. 25 per pair.

94. *Kalikapur*.—There are about 20 weavers in this locality who weave *saris* and *dhutis* from imported mill-made and home-spun yarns varying from 20's to 40's. The yarns are purchased locally or are imported from Comilla. The finished fabrics of coarser variety are sold locally and the finer fabrics are sold to Comilla merchants at rates varying from Rs. 5 to Rs. 8 per pair. Fly-shuttle looms do not find favour with them but with the increased demand for country made cloths they are trying to introduce improvements in their primitive looms.

95. *Gunabati and Jukaran*.—About 20 families of weavers are engaged in these villages in turning out coarse cloths from home-spun and mill-made yarns which they get from Feni and Comilla. The finished products find a local market. The weavers as usual prefer the primitive looms to fly-shuttles.

96. Besides the above centres, about 200 weavers are engaged in the south of Comilla in weaving coarse cloths such as *dhutis*, *saris*, *gamchas*, etc. These are sold locally and are also exported through merchants to other districts.

97. *Jute*.—The chief centres of the jute weaving industry in this district are Rammohan (Sadar), Homnabad parganas, Shibnagar, Rajmangalpur, Mirpur and Dharmanagar (thana Kashba), Shibpur and the neighbouring villages within the jurisdiction of Nabinagar thana and Bholakot (than Nasirnagar). The workers engaged in this industry are all Kapalis. The finished products are similar to those of Barisal and the methods of weaving and the disposal of the finished products are almost the same as those followed by the Barisal Kapalis.

Spinning of fibres.

98. *Cotton*.—The impetus given by the present movement to hand spinning and hand weaving has induced many persons to take to spinning and about 10,000 spinning wheels are working in this district at the present time.

99. *Jute*.—Jute spinning is carried on by the Kapalis of the district with the *takko* and the yarns produced are used in making gunnies.

Hooka making.

100. This industry has been in existence at Comilla from time immemorial and is mainly confined to Muhammadans. Many of the workers solely depend upon this industry, while there are others who take it up as a supplementary profession, depending mainly upon agriculture. The shells are obtained from Dacca, Backerganj and Noakhali, without any husk, at prices varying from Rs. 10 to Rs. 60 per thousand according to quality. These are then shaped and polished by simple hand tools. They are dyed black with tari-pods and ferrous sulphate, etc. The nature of the dye and the process of dyeing is kept a secret. About Rs. 5,000 to Rs. 6,000 worth of these shells are used up every year and the value of the finished products is about Rs. 10,000. These *hookas* are generally sold at Dacca, Sylhet, Brahmanberia and Assam. The economic condition of the workers is far from satisfactory.

Nalcha making.

101. *Nalcha* are manufactured in Comilla and its suburbs. There are about 40 workshops in which about 200 workmen are engaged. The workers are mainly Muhammadans. The wood is obtained from the Hill Tipperah forests at Re. 1 per cft. and it is turned into the required shapes by means of primitive hand lathes. The preliminary shaping is done by ordinary carpenter's tools. The *nalchas* are then dyed black. About Rs. 5,000 to Rs. 9,000 worth of raw material is worked by the men annually. The chief markets are Dacca, Mymensingh, Jalpaiguri, Brahmanberia and Assam. The workers earn about annas 12 per day.

Penholders.

102. There are two persons in Comilla engaged in the manufacture of penholders. They turn out 4 to 5 gross of these holders which find a ready local market.

Boat making.

103. Dingies and cargo boats are made to some extent in thanas Homna, Bancharampur, Nabinagar and Sarail of the district.

Card-board slates.

104. Card-board slates are manufactured on a small scale at Aminabad (thana Daudkandi). This industry is carried on by only one man

assisted by three or four workers. The raw materials used are sand, resin, shellac and lampblack. A thick solution is formed of the above ingredients and it is then painted on a card board. The quality of the slate though not very good, finds a good sale at Comilla. The slates are made only in one size (9½" by 7½") and are sold at annas 4 per piece retail or Rs. 30 per gross, wholesale. The total output is about 4½ gross per month.

Articles of bamboo, cane, sola.

105. Hill people in the district are very skilful in making bamboo wares. Baskets of various sizes and shapes are made from split bamboo and are used in exporting cotton and food grains.

106. *Khalpa or chatai from bamboo.*—The chief centres of this industry are Kalikapur and Burichang. About 35 to 40 men in Kalikapur are engaged in this industry. The bamboo is obtained from Hill Tipperah and the finished articles are exported through middlemen to Dacca, Narainganj, Calcutta and Chittagong. The average income of *chatai* makers varies from Rs 8 to Rs. 10 per month.

107. In Burichang about 300 workers are engaged in this industry. *Chatais* are made from split bamboos. The economic condition of the workers is far from satisfactory. The workers are entirely under the influence of *mahajans* who advance money and get the men to work under a contract system at a certain fixed rate. The finished articles are exported to Dacca, Narainganj, Chandpur, Lohajang and other important places.

108. Umbrella handles are also made from bamboo in the district and there are two factories at Brahmanberia manufacturing the same.

109. *Cane.*—Nice cane articles are made in this district. At the Comilla Jail all sorts of articles are made of cane. In the villages of Konda, Binuti, Malai, Ranidia, Jinadpur, Meruna and Uttardhantalia in the Brahmanberia subdivision, various kinds of cane articles such as cane bags tiffin baskets, trays, chairs, etc., are produced. These are in no way inferior to those imported from Japan. The articles are exported to Calcutta and are sold at the following prices:—

<i>Double-flapped bags—</i>			<i>Baskets—</i>		
		Rs. A.			Rs. A.
16"	..	3 9	18"	..	1 4
15"	..	3 2	20"	..	1 6
14"	..	2 9	24"	..	1 12
12"	..	2 2	26"	..	2 2
<i>Single-flapped bags—</i>			<i>Suit cases—</i>		
16"	..	2 9	16"	..	1 5
15"	..	2 5	18"	..	1 8
14"	..	2 3	20"	..	2 2
12"	..	1 10	22"	..	2 5
			24"	..	2 9

110. *Reeds*.—Patis of ordinary type are made in large quantities in some of the villages near Comilla from a kind of plant (*motag*) which is grown extensively in the villages of Udiapur, Seriamina and Bishalgarh and Hill Tipperah. The finished products are sold to Comilla merchants as well as to local customers at wholesale and retail rates. *Sital patis*, which are of finer qualities are made to some extent in the villages at Etharpur and Asrappur (police-station Chandina) of the Brahmanberia subdivision, and Shahatali and Hajuganj (police-station Chandpur) in the Chandpur subdivision.

111. Caps from the palmyra fibre are made by Muhammadan women in their leisure hours and are sold at prices ranging from annas 3 to annas 12 according to quality.

Brass articles.

112. The chief centres of this industry are Brahmanberia, Ramchandrapur, Bitgarh, Mogra, Badurgarh and Pandhan-Khanbazar. In Brahmanberia alone there are about 50 houses concentrated in one place and known as Kansharipara. The workers are called Kansharis and are Hindus by caste. The brass wares such as *kalsis*, *ghatis*, *degchis*, etc., are made out of imported rolled sheets and are exported to the neighbouring districts. Old brass articles are also melted down and are beaten into sheets for making the bottoms of the brass vessels. There are some rich Kansharis who do not work themselves but employ labour and have the goods made at their houses. The average income of an artisan varies from Rs. 15 to Rs. 20 per month. The workers as usual are very conservative and do not like to take to any improved methods of work.

Chanks.

113. Buttons are made from mother-of-pearl shells in many of the villages of Tipperah specially at Ramcharanpur and Ranidia in the Brahmanberia subdivision. The shells are bought at a nominal price from fishermen who carry on pearl-fishery in the Meghna river.

Tanning and leather goods.

114. Hides are exported to Dacca and Calcutta from Tipperah to some extent. There is, however, no organised tannery in the district, but the village *moochis* tan the hides in the ordinary bark-tanning process and make inferior shoes and slippers for the poorer classes. The chief centres are Comilla, Chandina, Chandpur and Brahmanberia.

Pottery.

115. The important centres of this industry are Haripur and Brahmanberia. One Sarat Chandra Pal of Haripur manufactures earthen bottle-filters. The smaller ones sell at annas 10 each while the larger ones are sold at Rs. 5 to Rs. 6 each. Sand and powdered charcoal are mixed and used as the filtering surface. The industry is done on a small scale and the process of manufacture is kept a secret. There is also a tile factory at Brahmanberia.

Safety matches.

116. There are about 8 factories in Tipperah equipped with Dr. Nandi's machines, known as the—

- (1) Pioneer Match Factory, Comilla;
- (2) Ghose's Match Factory, Comilla;
- (3) Islamia Match Factory, Charta, Comilla;
- (4) Brahmanberia Match Factory;
- (5) Match Factory, Shahatali;
- (6) Match Factory, Puranbazar, Chandpur;
- (7) Match Factory, Kalikachha;
- (8) A House of Labourers, Comilla.

The total output of these factories is about 20 gross per day and about 100 workmen and boys are employed in them. Match machines are turned out in Dr. Nandi's factory at Kalikachha. On the whole 50 to 60 machines have been sold so far.

Oil pressing.

117. There are two mills, one at Ashuganj and the other at Chandpur. Both these mills are doing well.

Hoisery.

118. There is a hoisery factory at Comilla manufacturing under-wears. Six men are employed in this factory and the outturn is about 2 dozen daily.

NOAKHALI DISTRICT.**Weaving.**

119. *Cotton.*—The chief centres of cotton weaving are Feni, Begumganj, Lakshipur, Chhagalnayia and Parashuram. *Dhutis, saris, gamchas*, checks and coloured cloths, both of coarser and finer varieties suitable for shirting and coating are woven. *Lungis* of superior quality dyed with fast colours are woven in the villages near Munshirhat and Feni. Mosquito nettings of Chaumuhani both white and coloured have a reputation in the market. *Jam saris* and *saris* of superior qualities are also woven in Noakhali. Noakhali fabrics are now in great demand specially the *saris*. At Chaumuhani *hat* which is held every Tuesday, wholesale dealers and buyers from different localities flock together and business in cloth worth about Rs. 35,000 is transacted every week, while yarns worth about Rs. 35,000 are purchased by the weavers.

120. *Jute.*—There are about 50 houses in Nateswar (thana Begumganj) and about 40 houses in Hatripur (thana Senbag) engaged in making gunny bags.

Spinning of fibres.

121. *Jute*.—Kapalis spin jute for the making of gunny bags, etc. Jute ropes are also made at Chaumuhani and sold locally.

122. *Cotton*.—The villagers in the Parashuram and Chhagalnayia thana have recently taken to spinning. About 15,000 *chūrkas* are working in the district.

123. *Reeds*.—*Sital patis*, *chikvis* and *chatais* are made in Chhagalnayia and Parahsuram.

Carpentry.

124. There are two classes of carpenters—Hindus and Muhammadans. The latter class belong to Chittagong and are engaged on monthly wages ranging from Rs. 20 to Rs. 30 per month. Ordinary almirahs, shelves and tables are made. The Hindu carpenters of Swarupur and Gopalpur are noted for their workmanship. Sandip carpenters are known for their skill in making elaborately carved bedsteads, which find favour with the village grandees. Indian sugar-cane presses are also made in Chhagalnayia.

Blacksmiths.

125. The blacksmiths of Dattapara are famous for their skill in manufacturing cutlery known as *ramdaos* and *daos*. These are generally decorated with brass ornamentation.

126. The blacksmiths as a class seem to be free from debt. They are, with a few exception, well-to-do but are getting on pretty fairly. The articles manufactured by them are generally sold direct to customers at their workshops. The introduction of improved hand implements might lead to far better results.

127. In Noakhali some blacksmiths make bolts and nuts and do ordinary repair works.

Brass.

128. Five shops in the town of Noakhali manufacture *badnas* and cap-moulds. The artisans are the natives of the district and have been carrying on their work in the old stereotyped fashion. A worker can finish 3 cap-moulds in 2 days. It is usual to take up 16 *badnas* at a time and to finish up the whole thing in about a fortnight. The articles are generally disposed of wholesale. The sale of these articles becomes brisk during the *melas*. The cap-moulds are sold at Rs. 1-8 to Rs. 1-12 each. The *badnas* are generally sold by weight at Rs. 2-8 to Rs. 3 per seer.

Pottery.

129. The important centres are the villages of Champaknagar and Andharmanik under police station Chhagalnayia. The potters manufacture earthen *garus*, *badnas*, *shankis*, cups, jars and other small articles of pottery.

Chemical industries.

130. *Soap*.—There is a small soap factory started at Hatya Island. Washing soaps are being manufactured from cocoanut and punnal oil.

131. *Safety matches*.—There are three factories, one at Feni, one at Chhaumuhani and one at Rajarampur, equipped with Dr. Nandi's machines. The total output of these factories is about 8 gross a day.

Sugar making.

132. At Sandip *gur* known as *rab* is manufactured in fairly large quantities. Of late the industry has developed in the Government Estate Char Bagsi (situated on the north-western border of the district) where the cultivation of sugar-cane has been introduced. The *gur* thus made is mostly sold in the Lakmipura bazar. It is also manufactured near Chhagalnaya. But in point of quality Bagsi *gur* is better.

Oil pressing.

133. *Punnal oil*.—This oil is extracted from a fruit called punnal which grows in the Sandip Island in the district of Noakhali. The chief centres are Sandip, Madarhat, Maitvanga, Bhuiarhat and Choudhuri's *hât*. The industry is an old established one and is carried on by Muhammadans, who are inhabitants of the island. In all about 35 families are engaged in it. The fruits are purchased from the market at 2 to 3 annas per seer. They are decorticated and the kernel after being dried are put into ordinary *ghanis* and the oil is extracted from it. About 2 maunds of the dried fruit yields a maund of oil which is sold at Rs. 22 to Rs. 24 per maund. The total annual output is about 3,000 maunds. The oil was formerly used for burning but is now utilised in the manufacture of soap. It is also exported to Dacca, Chittagong and Hatya Island. The oil cakes are used as fuel and also for the making of *tikkas* for smoking. It is sold at 1 anna per seer.

134. *Cocoanut oil*.—It is manufactured for household consumption. The process is simple but protracted. The kernel is first of all scraped out by means of an instrument called *kuruni*. The scrapings are then put into hot water stirred by hand and finally the water is wrung out through a thick piece of linen. The process is continued till the water wrung out loses its milky appearance. The mixture is then boiled and the water evaporated. In the winter about 12 nuts and in the dry season about 16 yield a seer of oil. This oil is sold at 12 to 14 annas per seer.

Buttons.

135. Buttons are made from mother-of-pearl and cocoanut shells at Durgapur (police-station Begumganj).

Possibilities of new industries.

136. *Blanket weaving*.—There are prospects of starting a blanket weaving factory at Sandip. About 3,000 sheep are available in the char islands for the collection of wool but the entire quantity now runs to waste.

137. *Button making*.—Buffalo horns are plentiful in these islands. A button making factory should thrive, provided suitable arrangements were made for the collection of horns.

138. *Cocoanut oil*.—The manufacture of cocoanut oil and coir rope may be taken up also. Suitable centres for the establishment of these industries would be Harishpur in Sandip, Nalchira in Hatya, Chhaumuhani, Lakshmipura and Sonapur.

Remarks of the Director of Industries on the survey of cottage industries by the Superintendent of Industries, Chittagong Division, made during 1921.

The Superintendent of Industries has made a careful survey of the conditions obtaining in his Division and his report deals with the following main industries :—

- (1) Cotton weaving.
- (2) Silk weaving.
- (3) Cotton ginning.
- (4) Spinning of jute, coir, sunn-hemp.
- (5) Boat building.
- (6) Bamboo and cane work.
- (7) Tanning and leather goods.
- (8) Sugar and *gur* manufacture.
- (9) Match making.
- (10) Miscellaneous.

2. In regard to the weaving industry, apart from the excellent work done by the weaving schools at Zorwarganj, Chittagong, Noakhali and Begumganj, there is an urgent need for demonstrating the improved output value of the fly-shuttle loom. The only means available for following up and supplying this need is the agency of the Demonstrating Weaving and Dyeing Party sanctioned by Government. There are no peripatetic weaving parties working in the Chittagong Division but the case for the same will be carefully examined.

3. *Tanning industry*.—The report shows that there is a *prima facie* case for the establishment of the tannery industry on improved lines in the Chittagong area. The Department has already conducted tanning demonstration which has met with some encouraging response. This work will be followed up with the object of persuading private persons to take up the industry on modern lines in accordance with the schemes outlined in the "Small Tannery Scheme" (Bulletin No. 15).

4. The jute, coir and sunn-hemp fibre spinning industries for the manufacture of rope, coir yarn, gunnies, etc., offer opportunities for improved methods. Some progress has already been made in explaining the advantages of an improved spinning device which have met with a fairly reasonable response and work in regard to which is still proceeding with prospects of useful results.

5. The match-making industry has been making some progress and the Department has given considerable assistance in devising improved

mechanical methods which have been particularly appreciated. The subject of the improvement and the possibilities of the match industry is under an exhaustive examination by the Department.

6. None of the other industries afford opportunities for development on improved lines with the present resources of the Department although help by means of advice and information has been given to the umbrella handle workers, the button workers, the brass industry at Brahmanberia and wherever enquiries were made with some prospects of useful result.

D. B. MEEK,

Director of Industries, Bengal.

The 25th June 1924.

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