CHAPTER IV

METHODS OF PRODUCTION
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There are a number of references about weaving operations in India. Among the findings at Mohenjo Daro were numerous spindle whirls in the houses and these indicate the fact that the whirls of that period were made of cheaper pottery and shell. The technical terms like 'Hantu' (Warp), 'Otú' (Weft) are found in the Rig Veda and the Atharva Veda while 'tasara' (shuttle) and 'Veman' (Loom) are mentioned in the Yajurveda and these indicate that spinning and weaving were carried on as early as the Vedic Period.

The process of weaving is reflected in the Mahabhaṣya which states that the warp was stretched (astiram tantram) and then threads were woven across it with a shuttle. The Divyavadana gives us some idea of the different process of ginning, cleaning, pressing, carding, spinning and weaving. Starching of yarn before weaving to increase the weight of woven cloths is also heard of. Kautilya allows starching with 10%
increase in case of cotton, \( \frac{1}{4} \)\% increase in cases of linen and silk and 2\% increase in case of wool.\(^1\)

Kautilya gives us the following picture of the textile industry in the Maurya period. He says that it was carried on under the supervision of the Superintendent of the spinning and weaving Department:

"The Superintendent shall employ qualified persons to manufacture threads, cloths, coats and ropes. Widows, cripple women, girls, ascetic women, shall be compelled to work in default of paying fines. Mothers of Prostitutes, Old-women servants of the king and Prostitutes who have ceased to attend temples on service shall be employed to cut cotton, wool, (tula) silk, hemp and flax. Wages shall be fixed according to the fineness of the yarn. Those who produce large quantities shall be rewarded with oil and emblic unguents. Wages shall be cut short if the out turn falls short. The Superintendent shall closely associate with the workmen. Those who manufacture Ksauma, dukula, (mentioned in first Chapter)

Silk, Woollen and Cotton cloths shall be rewarded with special presents.... Those women who do not stir out of their houses, those whose husbands have gone abroad, those, who are cripple or girls may, when obliged to work for subsistence, be provided with the work of spinning out threads in due courtesy through the medium of maid servants. Those woman who can present themselves at the weaving house shall at dawn be enabled to exchange their spinnings for wages. Only such light as is enough to examine the threads shall be kept. If the Superintendent looks at the face of such women or talks about any other work, he shall be punished with the first amencement, and with the middle fine if he delays in paying the wages or if he pays for the work, not done. She, who, having received the wages, does not turn out the work, shall have her thump cut of (according to Shama Sastry, the translator of Arthasastra. But Mr. Roy is more justified to explain the text "Samdamsanam" as fixing tightly an iron ring around the thumb" because cutting of thumb seems to be too harsh a punishment for a person, employed in spinning and weaving which becomes impossible without thumbs).  

2. Ibid., pp. 76-77.
The above said weaving operations were carried on by the people of India including the Tamil country without having any major changes. The handloom weaving industry was practised both by rich and poor people in general and weaving castes in particular. Now we shall see how the cloths were produced during the nineteenth century in Tamil Nadu. The process in the production of cotton handloom cloths includes ginning, spinning, warping, sizing, twisting, weaving, dyeing and the using of gold and silver threads in cloths. The following pages reveal various process in the manufacture of handloom cloths.

1. GINNING:

During the period of our review it is known that some important works were carried out before one was to spin yarn from cotton. The cotton in the state of Kapas (i.e., seeds and wool unseparated) or raw cotton was cleaned and prepared by the women who spun the yarn. Fragments of leaves, stalks and capsules of the plant were carefully picked out with the fingers. Then the spinner sat down to the laborious task of cleaning with an instrument to separate the seed from cotton.
COTTON CLEANER:

The cleaning was effected by means of a foot roller which separated the cotton from its seeds. This cleaning apparatus consisted of two teakwood rollers, fluted longitudinally with 5 or 6 grooves, revolving when it contact. While the upper roller was turned with a handle the lower one was carried along with it by a perpetual screw at the axis. The cotton was placed on one side and drawn through the revolving rollers. Since the opening was kept smaller than the size of the seeds they were thrown out to the side opposite the cotton. It was next rolled round a piece to the size of a quill. In every village this sort of hand-gins well owned and managed by dealers. After seperating the seeds from cotton, yarn was produced from cotton by spinning.

Fig 2: A Spinning Wheel

Source: Elijah Hooke, A Mission to the South of India (London, 1829)
SPINNING:

The implements and equipments employed for spinning were simple and meagre. Spinning was mainly performed by an implement called Takli' or Spindle. The Takli consisted of a thin metal rod and it was not much thicker than a stout needle. It was from ten to fourteen inches in length. It had a crochet-like hook at the top in which the yarn was caught while undergoing the operation of tuning. At the bottom of the Takli, a small ball of unpacked clay or wood was attached in order to give sufficient weight while tuning. If the takli was rotated by right hand, the cotton was feded in the left hand, the thread would come easily from the cotton. Thus spinning was done by using Takli.

CHARKA:

Another instrument to spin yarn from cotton which was prevalent in Tamil Nadu was Charka. The Charka consisted of two wooden rollers fixed horizontally on one above the other across a frame. By means of a

handle attached to the side the cylinders were made to
revolve in opposite directions, the raw cotton was
placed between the rollers which, while rotating,
segregated the seed from cotton. Spinning was
performed by a light spindle made to revolve in a frame
by means of a wheel and a band, the wheel being driven
by the right hand while the cotton was held with the
left. More frequently the cotton was spun on to a
bobbin of chola m stalk, which was fixed to the spindle
of the hand spinning wheel. The yarn spun by the
Charka was thick and twist. But many varieties of
yarns were spun by using their Charka in different
parts of Tamil Nadu.

It appears a weaver would earn about three annas
a day by using the charka in spinning. In those times
of monsoon failures, the Charka spinning machinery could
be found to give the agricultural population a subsidiary
income. Moreover, large sections of the farmers in

5. Elijah Hoole, Personal Narratives of a Mission to the
South India, (London, 1829), Part-I, p.156;

Presidency, (Madras, 1924), p.17.
Tamil Nadu took spinning as this part-time work and coarse thread spun by them was given to the weavers who wove them into cloth on being paid about one rupee or its equivalent in grain for each cloth. Such cloths were extensively in use in Coimbatore, Salem and Ceded districts.7

Tennant gave his appreciative description about the simple instruments, used by the weavers for spinning and weaving. He stated, "in the manufacture of fine muslin, in which they excel all the world, the wheel, the reel and the loom, are of the simple artless structures. Yet the work produced cannot be equalled by European machinery, aided by every effort of ingenuity and skill".8 Thus by using of takli, and Charka, the weavers spun the yarn from the cotton, and the cloth they produced was par excellence.

**NUMBER AND REELING OF YARNS:**

Yarn was spun in varying thickness according to the requirement. It was generally classed as coarse,

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medium and fine. The exact thickness of the yarn was denoted by the term "number" or "Count". Two factors were taken into account for the purpose of determining the cotton yarn, (a) length and (b) weight. Count of yarn therefore showed the relation existing between certain standard length and weight. Yarn was wound in the form of skeins termed 'hank' and the length contained in each hank differed according to the class of yarn. Generally, the unit length for cotton and spun silk yarn was 840 yards and woollen yarn 250 yards. The unit weight in all these cases was a pound or 7000 grains.

There were two systems adopted in ascertaining counts. Cotton, spun silk and wool were based on a system where the weight unit was fixed and the count differed with the length contained in the fixed weight. Therefore, in cotton yarn the number of hanks (840 yards each) required to balance a weight of one lb indicates the count of yarn. Further, in order to increase the strength of yarn and to obtain ornamentation in cloth, single yarn was made up into folded or compound thread by a process of folding and twisting. 9

Generally, yarn was made in the form of hanks. It was convenient for bleaching and dyeing of yarn and for packing and transport. Hanks (silupai or Sittam in Tamil) were made up into knots (Bhondu in Tamil) and then packed in bundles. These hanks were further reeled for the convenience of the weavers. The threads were laid side by side and the hank was divided into seven parts known as leas (Kunjam in Tamil). Each lea contained 120 yards. The circumference of a hank was 1\(\frac{1}{2}\) yards and there were 90 threads to the round in a lea. With the help of the leas, weavers were able to count the threads and divide hank so as to remove from it a portion of the yarn for preparing warp of short length.\(^{10}\)

**WARPING:**

Warp which consisted of a number of strong threads laid parallel to one another. They were kept under tension and formed an essential part of manufacturing process.\(^{11}\) All woven fabrics were composed of at least

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two distinct series of threads. Longitudinal threads placed side by side were known as "Warp" threads. These threads were interlaced by an unbroken single thread passing from edge to edge termed as "Weft". The interlacement of warp and weft threads at right angles to each other so as to form a woven fabric was known as "weaving". Warp yarn was spun from better class of cotton and with great number of twist per inch than weft yarn for the same counts as the strain put upon warp yarn during weaving was greater than weft yarn. Warp yarn was stronger and hard twisted whilst weft yarn was comparatively weak and soft twisted.

**PREPARATION OF YARN FOR WARping:**

The process for the preparation of yarn for warp consisted of winding and warping.

**WINDING:**

The primitive system of winding was practised by the weavers i.e., the stick cage winding.
Fig. 3. STICK CAGE WINDING

STICK CAGE WINDING:

The apparatus consisted of a hank stand and a stick cage.

(a) Hank Stand: This was a six-sided frame made of bamboo sticks which revolved on a pivot.

(b) Stick Cage: This was a tapered frame made of bamboo stick.

The operation of stick cage winding consisted in unwinding yarn from several hanks and winding it on to a stick cage or bamboo cone known as "Parwattam". The hank was placed on a stand and a stick cage on which the yarn was to be wound was held in the right hand. The free end of the thread in the hank was attached to the stick cage and the handle turned by the right hand so as to wind the yarn from the hanks to the stick cage. The object of winding was to obtain a continuous thread of considerably greater length than that contained in a hank and to place it in a compact form suitable for the subsequent operation of warping. 12

Fig. 4. STICK WARPING

In all the districts of Tamil Nadu the old system of warping was practised, i.e., the stick warping. This operation was usually performed in a field or any open place convenient for the work near the weaver's house. The stick warping consisted in fixing in the ground in couples light bamboo sticks, three feet long with a space of four feet between successive couples. A stout rod was firmly fixed on the ground at each extreme to bear the strain of the warp in preparation. The warper held a stick cage or parwattam containing yarn in his hand, walked up and down the line intervening the thread between the bamboos in such a way as to pass the thread outside the first and inside the second stick of each couple, then is passed round the stout rod at the end at returns, laying the yarn in the reverse order. The length of the line and the number of the bamboos depended upon the length of the warp desired to produce. As soon as the threads were arranged, the light bamboo

Fig.5. STREET SIZING

sticks known as lease rods, were plucked up and rolled together with the threads upon them. These lease rods which divide the yarn into two layers maintain a cross arrangement of the warp, without which it would be impossible to carry out the subsequent process of sizing. Sizing was the next process after warping.

**SIZING:**

Sizing is a more important process than warping. The cotton yarn with its rough surface cannot withstand the strain and friction caused in weaving. The primary object of sizing is to make the yarn smoother and stronger, thereby enabling them to more effectively withstand the tensile strain and friction to which they are subjected chiefly by the pulling action of the healds and the fingerling action of the reed, shuttle and sley during weaving.

During the 19th century, in Tamil Nadu, Sizing was done by the weavers generally in the morning hours, mostly in the tamarind groves and streets. 14 Sizing

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was uniformly practised by the weavers which is as follows. The warp was stretched horizontally in sheet form by inserting a stout bamboo through the loops at each end. These bamboos were secured by a rope passing over a trestle to a peg firmly fixed on the ground. Bamboo lease rods were inserted at regular intervals in place of lease bands and the threads separated and placed in regular parallel lines. The size or congee made from rice or ragi flour was spread evenly over the sheet with a small brush and then brushed into the yarn several times in one direction alone by means of a long heavy brush extending the width of the warp. The threads were prevented from sticking together during the course of drying by frequently separating the lease rods which divided them into two layers. The sheet was then reversed and the process of sizing continued and when the warp was dry, gingilly oil was spread over it, brushed and allowed to dry. It was afterwards rolled upon into a coil or bundle and the lease bands were carefully retained in position. This was the method of sizing that prevailed in all districts of Tamil Nadu and in other parts of Southern India.  

COST OF SIZED WARPS:

A good deal of variations existed in different weaving centres in Tamil Nadu in the method of preparing the sizing warps. The rates charged for sizing depended upon the length of time taken up as well as agency. Generally, winding and warping were attended to by the women and children leisurely during the intervals of household duties and sizing was done by the weaver with the assistance of a brother weaver who helped him in turn.

The following statement shows the cost of sized warps by the indigenous method. The rates shown below were those charged by the Saurashtra Association, Madurai in the 19th century.¹⁶

1. Sale price per yard of hand sized warp - 7.5 Pies
2. Cost of production per yard - 5.2 Pies
3. Difference between the sale price and the cost of production per yard - 2.3 Pies

This table shows that there was a profit to the weaver in sizing also.

The main object of sizing was to give smooth surface to the yarn and impart to it the utmost strength, by which it became suitable for weaving.

**DRAWING-IN**

The sized warp was taken to the weaver's house and the warp threads were first passed through the healds and then through the reeds. The first process of passing the warp threads through the healds is called drawing-in. The process involved the drawing of warp threads in consecutive order through the respective eyes of the healds. The sized warp bundle was placed on a stand with the threads falling nearest to the healds. The set of healds was suspended vertically whilst the reed was held in position horizontally. A person known as "Drawer" first passes a drawing-in hook through the eye of the heald and another person known as "reacher" picks a thread at a time from the lease rods and hooks it to the drawing-in hook. The hook was then withdrawn bringing the warp thread along with it. A second warp thread was next drawn and both these rods were now taken through, by means of a reed hook between the dents of the loom reed. 17 Thus all the warp threads were passed

through the healds first and then the reed.

**APPLYING THE REED TO THE WARP:**

The process of applying the warp through the reed is as follows. "The reed is generally applied to the warp after the preceding operation, i.e., drawing-in. The finest reed used in the handlooms contains only 2800 dents in a space of 40 inches in length. In order to apply it to the warp, the latter is folded up in the form of a bundle, and suspended from the roof of the weaver's hut, with one end of it unfolded, spread out, and hanging down to within a foot or two from the ground. The reed is then fastened with two slight cards to the bundle and lease rods, and it is hung in front of the unfolded portion of the warp. Two workmen seat themselves, one each side of the warp. Having cut with a knife a portion of its end loops, the man in front passes an iron wire or sley hook through the first division of the reed to the other workman; and the ends of the two outermost threads being twisted upon it by him, it is drawn back, and the thread thus brought through. In this manner the wire is introduced through all the divisions of the reed in succession, and
Fig. 6  WEAVING  -CONJELYHAM

two threads are drawn through each of them at a time. The ends of the threads are gathered in bunches of 5 or 6, and knotted, and through the loops formed by these knots a small bamboo rod is passed. Thus reed was applied to the warp by the weavers and now the warp was ready for weaving.

WEAVING:

This is the final stage in the process of cotton and silk cloth manufacture. The most striking facture in the handloom industry in all parts of Tamil Nadu, as Elijah Hoole described, was that the body of the machine, where the weaving was performed, was a few inches only above the surface of the ground. He stated, "Of course, it follows that the weavers could make no use of his feet, in working the treadles were it not for deep hole which digs in the earth, for the purpose, at the edge of which was seated and which contains the treadles required for his work".


HANDLOOM:

The Chief parts of a handloom for weaving are described by D.M. Amalsad, an expert in handloom weaving. It is known that these technicalities are still in practice. The following are the chief parts of a handloom is set up ready for production.

PLEATS: "The warp threads wounded on sticks is taken to the loom. It will be let loose in pleats of three or four yards according to the convenience, and tied to the breadth of the loom which will be gradually rolled when the weaving is on. This process of loosening the warp thread in pleats will be repeated till the warp is woven."

BACK REST: "It is a wooden cross bat the function of which is to serve as a guide for the warp threads and to maintain the warp line at the required level throughout the process of weaving".

LEASE RODS: "These are two light wooden sticks inserted in the warp threads for maintaining the leases or threads in the form of a cross so as to avoid entanglement".
HEALDS: "They are cords fastened to a pair of sticks. Some healds are provided with loops whilst other's are not so provided. In the case of loop healds, the loop of each cord is made in the middle of its length between the sticks. There are two sets of healds. Odd threads in the warp are passed through one heald and even threads through the second heald. The lifting of one set of warp threads above the other is termed "Shedding" and the space created is known as a "Shed". These healds are connected with treadles at the bottom of the loom".

TOP LEVERS: "These are wooden rods each tied to a heald with a cord, for facilitating lifting of healds. Healds are raised by pressing the bottom treadles which are connected with the top levers through the healds."

SHUTTLE: "The shuttle is made of the lightwood and has spear headed iron points. It is from 10 to 14 inches in length, and three quarters of an inch in breadth, and weighs about 2 ounces. The weft yarn is first wound on a piece of wood known as a 'Pirn' and is placed inside of the shuttle. A pirn fixed in the hollow part of the shuttle serves to hold the pirn on which the weft is wound."
To load the shuttle the weaver takes a pirn full of weft thread, fastens it to the pin, leads the loose thread through the guide and draws it out on the side of the shuttle."

**REED:** "This is a frame of parallel flat strips of wood or steel through which all warp threads are drawn. The fine wires in the reed are knitted together according to the closeness desired. The space between each wire is known as a 'dent'. The object of using a reed is to determine the closeness of the fabric to be woven, to serve as a back rest for propelling the shuttle, and to drive the weft firmly into the cloth."

**SLAY:** "This is a wooden frame to which is fitted the reed. The driving of the loosely laid weft firm into the cloth, is known as 'beating.'"

**TEMPLE:** "This is a wooden frame with needles provided at each end. Cloths have a tendency to contract during weaving. Therefore, the points at both ends of the temple are placed in the two selvedges of the cloth and the temple held stretched out, thus preventing contraction. This also keeps the warp stretched to its
full width in the reed and thus avoids breakages of warp threads near the selvedges during weaving."

FRONT REST: "It is a wooden cross bar the function of which was to serve as a guide for the woven cloth and to maintain the warp line at the required level.

CLOTH ROLLER: "It is a wooden roller on which cloth was wound at frequent intervals during weaving."20

WEAVING MECHANISM:

The operation of weaving consisted in the performance of three motions in succession. Those are (a) Opening of threads or shedding of the warp threads, (b) throwing and picking of the shuttle through the shed, (c) beating of the weft into the cloth.

"The weaver having fixed the warp to the loom takes his seat in front of it and proceeds to work. He sits with his right leg bent under him, upon a board or mat placed close to the edge of the pit, and depressing one of the treadles with the great toe of the left foot, and thus forming the shed in the warp. He next pushes the

sly fully backward, so that the shed may appear in front of the reed thus giving room for the shuttle to pass through. The weaver then takes the shuttle in one hand and throws it through the shed from the point of his forefinger, catching it with the fingers of the other hand as it emerges from the shed on the opposite side. Above the reed is a reed cap by which the weaver, as soon as he has thrown the shuttles, seizes the sly with the hand thus disengaged and strikes the sly to the cloth. This brings the loose weft in front of the reed and strikes it into the cloth. In the meantime in order to lessen friction on the threads of the warp during the process of weaving, the shuttle, reed, and sly were all oiled. Then each hand is alternately used in throwing the shuttle and working the sly. This process is repeated but the healds are raised alternately. As the cloth is woven, the weaver moves the temple nearer to the last pick or fall of the cloth so as to keep the cloth stretched to its full width during weaving. As the operation of weaving is carried on the space in front of the sly gets shorter so that the distance becomes insufficient for the pendulum movement of the sly. The weaver, therefore, stops at every few inches, say 6 to 8 inches, of cloth woven, releases the warp
let-off and turns the cloth roller to roll the newly made cloth upon it". Before the cloth was rolled on the cloth roller, lime water was sprinkled in order to preserve it from insects. Thus the weaving operation was carried on in all the parts of Tamil Nadu in the 19th century. Dyeing the manufactured cloths forms the next important stage in the methods of production.

DYEING:

The world would look dull if all people wore clothing of the same colour. But, thanks to dyes, which give different colours to the textile fabrics. People think that colour makes textiles more attractive. Even colour is used for identifying the national flags, uniforms, trade unions etc.

Since very early times, people have used juices from fruits, plants and the bark of trees to colour their fabrics. Fabrics found in ancient tombs in Egypt

show that even those early days the knowledge of using
dyes from natural sources was well advanced.22

Pliny23 tells us that the art of colouring white
cloths in various permanent colours in different designs,
was practised in Egypt in his time and his detailed
description of process applied in almost every method
of dyeing, which were still followed in many parts of
the Madras Presidency and according to Hadaway, that it
was in vogue up to the close of the nineteenth century.24

After the beginning of the 17th century, we get
references in books dealing with Indian subjects to a
great variety of dyed or printed cotton. For instance,
in the records of 1634-36, it is said that a white woollen
cloth was sent to India to be dyed, by His Majesty King
Charles I. In 1640 it is stated that the prosperous
painted cloths were daily expected from Madraspatam.

Vol.IV, p.367.


24. W.S. Hadaway, *Cotton Painting and Printing in the
Thevenot tells us that the cloths coloured at St. Thome were much finer and of better colour than those of other parts of India.

In this connection, mention may be made that there is a reference as late as 1866-67 to an old man at Arcot town who then made chintzes, by using wood block figures which are given in the appendix No. III are obviously intended for chintz making. Havell and Edwin Holder gave their accurate account on dyeing centres like Madura, Kumbakonam, Wallajah, Arcot, Nagapatnam and Tinnevelly about the dyeing materials and process of dyeing etc., in their reports.

**DYEING MATERIALS:**

The dyeing was the hand maiden of weaving. The substances used in dyeing include metals, woods, fruits, leaves, roots, barks, insects etc., we can classify these substances under two heads, viz., colouring substances and Mordants.

25. A French Traveller visited India in 1687-90.

26. Special Officers appointed by the Madras Government to study the condition of handloom industry in the Madras Presidency, in 1880s.
I. COLOURING SUBSTANCES:

STICK LAC: (Kombu-Arakku in Tamil)

We are not able to get adequate information about the origin of this substance. Few people thought that it was a pure gum and the others believed that it was a deposit of a certain insect. But, we get first reference about this colouring substance from Edwin Holder. He said that he was informed by a dyer about stick lac that the dyer once found some of the substance on the branch of a tree in Madras in a fresh condition, and on squeezing it, he observed that it yielded a small quantity of bright red fluid like that of the blood. Stick-lac was, therefore, a resinous and natural substance that existed and obtained from the branches of trees such as banyan tree, accacia and croton etc., Edwin Holder opined that stick-lac yielded crimson dye nearly as bright as that obtained from Cochineal. 27

NOONA: The Madras dyers called Noona as a tree as well as a plant. The botanical name of Noona tree

was Morinda. This tree was very widely found in Tamil Nadu. The noon root was dried and powdered. When mixed with water it would give a golden yellow colour. If a little lime or ashes of milk hedge was added into this, a fine red colour would be obtained. The noon root was extensively used to get red dye. 28

PORASAMPOO: Porasan flower was called also palas flower. It was thriving well in many parts of Tamil Nadu. The flower when fresh is of a bright yellow colour, with alum, it would yield a yellow dye which turns to orange by the addition of a little soda. On wool, yellow dye is said to be more permanent than that obtained from turmeric.

KIRIMJEE: Another colouring substance used by the weavers and dyers was Kirimjee. The word Kirimjee is evidently a corruption of the English word Crimson, it is the name given by Madras dyers throughout Tamil Nadu to Cochineal. It is stated that Cochineal was imported from Hyderabad, where it is said to feed on the prickly pear, but other old records show that this insect was

28. Report on the Madras Exhibition of 1855,
See Introduction.
not a native of India. East India Company took efforts to rear these insects about the last decade of the 18th century and was successful. The dyers by using these cochineal insects obtained a beautiful colour, silk was dyed chiefly by with the help of Cochineal.29

**VARANTHANGI:** In Hindustani, it is called Patang; in English, Sappan. The decoction from Sappan wood was of pale orange colour.

**JABRA VIRAI:** (Arnatto) This is the seed of the Jabira Plant. It resembles somewhat in shape and size the seed of the Cassia tora called in Tamil Tagara Virai. The colouring matter obtained from the Jabra virai was chiefly on the outer surface of the seed. It was used for dyeing silk of various shades of yellow and orange.

**AVARAI:** (Indigo) This is the Tamil name for the indigo plant. This is the most important of all dye stuffs. European as well as native capitalists cultivated the Indigo plant and considerably improved the methods of extracting the pure colouring matter from

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it. From this indigo plant, blue colour was extracted. The colloquial name for indigo was neelum, but this referred to the colour (blue) and not to the plant from which it was obtained.  

KASA ILAI: (Memeeylon tinctorium)

Leaves of a tree called Kasa tree, was found in jungles and served as a colouring material. The leaves were used by the dyers as an adjunct to noona root for bringing out the colour, in preference to alum, which injures the thread. Cold infusion of the leaves imparts a yellow dye.

ANNA BEEDI: This is the Tamil name for Sulphate of iron which was used to get black dye for cotton, silk, wool and hemp. Previous to the importation of this substance, native dyers made use of pieces of rusty iron by steeping these in Sour Kanjee water. Even at the closing of the period of our study, this method of preparing iron solution was practiced by those dyers who could not afford to purchase the sulphate of iron.

**TURMERIC:** Turmeric gives a brilliant yellow dye without a mordant. For dyeing, the turmeric tubes were selected carefully by breaking or cutting a piece. If the fracture exhibited a rich colour, the root would yield a good dye. Madras turmeric was considered to be of a Superior quality.

**SEMBURAMPATTAI:** The bark of the Semburam tree (Ventilago Madras Patana) was used an alternative or adjunct in dyeing with noona root to modify the colour of the latter. The dyers extracted the Semburam bark and used in the last operation in dyeing cotton red. Different names were given to this bark in different districts of Tamil Nadu.  

**KUSUMBA:** This is the Tamil name for Safflower, the flower of the carthamus tinctorius. The flower was gathered and made powder and sold in the markets. When used for dyeing, it was put in a cloth and washed in cold water for a long time to remove the yellow colouring matter. It was then boiled and obtained the pink dye.

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II. MORDANTS:

This is the other kind of colouring substance. The name "Mordant" was given to those substances used in dyeing which possessed little or no colouring matter, but served to connect the colouring parts to the stuffs that were dyed. Few colours have the power to attach themselves alone to either cotton, silk or wool. These colours were generally made brighter and more permanent by the intervention of a mordant. The following are some of the substances most generally employed as mordants by the dyers of Tamil Nadu.

ALKALINE: Alkaline was an earth used by all dhobis instead of soap for cleaning cloths. Aplakkaram Vazuman and Savuttuman were the colloquial names of Alkaline in Madras. It was an essential substance to scour the cloth and also used as a mordant to mix with dye.

ALUM: Alum was called as padikaram in Tamil. The dyers had not used it very extensively as it was costlier than aplakaram.
TAGARA VIRAI: The seed of the Tagarai plant is called as Cassia Tora. Soiled seeds of Tagara Virai would give a connection between the colouring parts and the fibre.

CHUNAM: This is an ordinary lime made from burnt shells. It was sparingly used.

MYRABOLANS: (Gall-nuts) They were oval and of a dingy yellow colour. With alum, a good yellow dye, and with salts of iron, a black colour was obtained.\(^3^3\) It was used as a dyeing from time immemorial in India. Later, it was exported in thousands of tons annually to England.

SHEEP'S DUNG: This was used by the native and European dyers from time immemorial. This was useful for preparing red dye.

GINGILLY OIL: It was otherwise called as sossamum oil. It was extracted from the black variety seed. It was cultivated and consumed to a greater extent by

the natives for cookery, and for burning in lamps. In the process of dyeing it was used sparingly, to effect a permanent colour.

Besides the above mentioned mordant, lime juice, soda and marking nuts were also used as mordants.34

PROCESS OF DYEING:

Various methods of dyeing are described under different heads for cotton, silk and wool in the following pages. Of these, cotton dyeing is by far the oldest and the most extensively carried on in all parts of Tamil Nadu. In fact it may be said that the art originated in India.35 Generally, the yarn was dyed first and then woven into cloth, and at times cloth was also dyed.

THE DYEING OF COTTON:

In regard to the dyeing of cotton, the principal colours used were red, yellow, orange, blue, green, black, purple and pink.

RED: The red dye was prepared in all the places of Tamil Nadu, but Madurai was famous for finer red colours, which the weavers attributed to the waters of the river vaigai. The ashes of a plant called Umri (Salicornia indica) was steeped into water for ten days. Then the yarn or cloth was dipped and left for 3 or 4 days or until it became yellowish green colour. Then the cloth was dipped into the decoction prepared with Tinbura root, Kasa leaves and gingilly oil in the proportion of 16, 2 and 1 measure respectively. The cloth was left in this liquid for 2 days. Then it was taken to the river bed and left in very shallow running water for a day after which it was dried in the sun. This process of dipping the cloth in the solution and washing in the river water and drying in the sun continued consequently for 10 days after which the dyers got very fine red colours. 36

YELLOW: The colouring substances in this dye were turmeric, poorasam flower, Kasa leaves and myrabolans. For a viss of cotton to be dyed, one viss of myrobolam

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36. Selection from the records of the Madras Government
New (Revenue) Serial No.VI, 1909 - See in this G.O. No.1044, Revenue, 16 September 1884, pp.1-7.
half viss of turmeric, one viss of poorasam flower, half viss of dried kasa leaves and 1/4 viss of alum should be boiled. The twist should be immersed in the mixture for two hours. Then the twist was taken out and dried in the sun. Thus the yellow colour was obtained.

**ORANGE:** Yellow dull red or orange was obtained by boiling the twist yellow in a decoction of sappan wood for an hour and by adding some alum. Some dyers merely soaked the yellow dyed twist in a cold decoction of safflower in order to produce the orange colour.

**BLUE:** The colouring substance in this dye was Indigo. The blue colour was obtained by using indigo, alkaline lime and seeds of tagarai plant (*Cassia tora*). The number of operations multiplied according to the strength needed. The indigo bath always used was cold for cotton, silk and wool.  

**GREEN:** This colour was produced merely by steeping the blue cotton twist into the yellow bath described

above. Before the blue twist was immersed with yellow bath, it was well dried and exposed in the sun light.

**BLACK:** The colouring substance in this dye was iron. For a viss of cotton twist, first rusty iron pieces were steeped in sour Kanjee water for three days. In this solution, a viss of myrabolan was added. Then cotton twist was immersed. Then the twist was replaced and again boiled for an hour and washed in clear water. Thus, the fine black colour was obtained. 38

**PURPLE:** For obtaining purple colour, the yarn was first dyed red with noona root and then steeped in an indigo solution. Another method was to mix myrabolans, alum, Jaggery and powdered noona root in water. This mixture was kept in a vessel for three months and thus used for dyeing. Purple colour was obtained from this mixture.

**PINK:** The Kusumba or Safflower was used for this colour. The dried flowers were mixed with the solution

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of alkaline. Then lime juice was added. Bleached yarn was soaked in this solution and the yarn became pink in colour.  

THE DYEING OF SILK:

There were two kinds of Silks. 1. Kora silk (unbleached), 2. bleached silk. Kora silk was bleached by boiling it with aplakaram in water. The processes employed in dyeing silk in older days is as follows.

DARK RED: For this colour stick lac was required. The sticks were tied in piece of cloth and steeped in hot water. The liquid thus obtained was a fine deep red and then this was put into another vessel. A small quantity of tamarind pulp and alum was added to this liquor. The silk was then put into it and boiled for three or four hours and then washed. The colour, thus obtained was dark red.

DEEP YELLOW AND ORANGE: Orange was merely a deeper shade of yellow which was effected by keeping the silk longer in the dyeing bath. The colouring


40. Ibid., p.9.
substance used was kapila powder. The dyeing bath was prepared by first mixing half a viss of Kapila powder with a little gingilly oil and alum and made as a paste. This was later dissolved in required quantity of water. A beautiful orange colour was thus obtained into which the silk was steeped and kept soaking for a few hours if a deep yellow was required and for a whole night if a deep orange was required. 41

BLUE AND GREEN: For blue, indigo was used and for green, the blue silk was steeped in the turmeric bath. The process here was precisely the same as that employed for dyeing cotton.

BLACK: Black colour was produced on silk by using the same materials and employing the same processes described in the case of cotton. Here raw silk was used which was dipped in the solution of iron and myrabolams. 42

The following is the list of centres in the districts that dyed cotton and silk cloths. 43 In

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41. G.O.No.1475, Revenue Department, dated 11 April 1896.
43. Ibid.
Chingleput cotton dyeing centres were 16 and silk dyeing centre was 1, while in North Arcot it was 44 and 15; in South Arcot, 67 and nil; in Salem 36 and 14; in Coimbatore 30 and 2; in Tanjore 30 and 9; in Trichinopoly 22 and 1; and in Madura 26 and 2.

COTTON PAINTING AND PRINTING:

This is the other important work connected with handloom industry. The cotton cloths were painted and printed with the help of pen and wood blocks. Arcot, Wallajah in North Arcot District, Kanuppur in Trichinopoly district, Kumbakonam, Madura, Nagapatnam, Paramagudi, Conjeevaram and Tinnevelly were the places where cotton painting and printings on cloths were carried out. 44

The number of hand blocks used for printing is now kept in the Government Museum, Madras and the origin of a great number is not known. 45 It is said that the Maratha King Shivaji was very interested in

44. G.O.No.791, Revenue Department, dated 30 March 1885, Imperial Gazetteer of India, Vol.V, p.413.
Fig. 9 - Arcoot Wood Blocks.

wearing the Karuppur Cotton painted cloths.\textsuperscript{46} The following account will give us how the cotton painting and printing was done in the places mentioned above.

Before painting or printing the colours, cloths were bleached. Bleaching was done by soaking the cloths in a solution of sheep's dung, lime and water for one night. Then the cloths were dried and soaked. This process was continued for three days. After spreading out the cloths, the diagrams or natural scenes or God's figures were outlined and the colours prepared for dyeing were painted on the outline with the help of Kalam. The themes most popular among the weavers were from epics, Mahabharada and Ramayana. Other particular themes such as floral designs and flowering shrubs were painted on the borders. One could find the figures of gods like Ganesa and the birds like peacock and animals like monkey and deer were popular subjects shown on a painting. The most common motifs used were the tree of life, the batel leaf motif, the temple doom or gopuram.

\textsuperscript{46} Ibid., p.9.
Printing was carried on by covering the parts of cloths not to be dyed with wax as a resist for the dye. Then the cloth was dyed with desired colour. Later, the wax was removed by immersing the cloth in boiling water and the parts that were covered by wax were dyed with another colour. Thus, in a single cloth various colours such as red, blue, yellow etc., were printed.  

Printing done by using wood block was as follows. The cloth was spread on a table first and the wood block was kept on it. The dye was spread and pressed by hand on the wood block. Then the cloth was dried. The cloth became a designed printed cloth. Thus it seems that, there is no great difference between dyeing and printing. Dyeing applies to the entire cloth while printing leaves the background uncoloured and shows only certain coloured designs.

SYNTHETIC DYES:

The first synthetic dye was discovered from coal tar in 1856 by Henry Perkins (1838-1907) in England.

48. Havell Report on Arts and Industries - See in this G.O.No.695, Revenue Department, dated 11th August 1886.
The British Government began to export this synthetic dyes to India only from 1880 onwards. In the same year, the decline had started for the vegetable or indigenous dyes in India with the importation of foreign chemical dyes. By about 1900, we find that the aniline and alizarine dyes of Germany and England had more or less effectively, driven out all vegetable dyes from many parts of Tamil Nadu.

BEAUTY OF INDIGENOUS DYSES:

Before the importation of chemical dyes, this indigenous dyes were the "Cynosure of neighbouring eyes". Edwin Balfour a lover of Indian art once commented that the power of colouring a happy combination of tints, to the traditional instincts of Orientalists never to be attained by Europeans by any scientific methods. Again the fastness of our dyes were, without exception, pronounced by the lovers of art to be wonderfully pleasing to the eye.

It is a mistake to suppose, as some have supposed, that their colour scheme was very limited, it might not have been as wide as the colour scheme of chemical dyes, but it was wide enough to cover a large variety of tincts. 53

In appreciation of the beauty of Indian indigenous dyes Mr. Thomas Wardle, an English silk dyer of great experience, wrote a letter to His Majesty's Secretary of State for India in February 1875 in which he said as follows:

"India possesses a large number of dyestuffs, many of which are practically unknown to English dyers, no doubt mainly owing to the absence of any descriptive work on the subject and the inaccessibility of the information to be derived from the India Museum." 54


USING OF GOLD AND SILVER THREAD:

In the 19th Century the weavers of Madurai and Pamban used the Gold and Silver threads very lavishly in cloths. The weavers in Madurai area prepared the threads from gold and silver. They melted silver and lead in a clay crucible and cast the alloy into the bars. These were hammered still thinner and then drawn through a series of holes of gradually diminishing size until they were transformed into exceedingly fine wire. The women-folk of the weavers, then hammered this flat to make the thread. Gold thread was also made in the same way.\(^{55}\)

Havell recorded in his report that the gold and silver threads were used in the borders of the dhoties as well as in the cloths worn by women. But these cloths were produced by the weavers of Madurai and Tinnevelly districts only for the higher classes and for the rich merchants.\(^{56}\)

Thus the methods of production includes the process of spinning, warping, sizing, weaving, dyeing and the using of gold and silver to beautify the cloths.

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