CHAPTER II
Crafts and Industries.

1. Sericulture:

(a) Introduction: From times immemorial, spinning of cotton and cocoons of different kinds of silk worms and also extracting fibres from certain kinds of plants and trees have been in existence. The art of sericulture and the rearing of different kinds of silk worms for manufacturing different kinds of silk cloths were known to the people since the days of Ramayana and Arthasastra. Ramayana mentions the name of Magadha, Anga, Pundra and the "country of the cocoon rearers". This country of "Cocoon rearers" is believed to be no other than Kamarupa lying to the east of Pundra by the historians of the early period. In the 'Arthasastra', Suvarna Kundya is mentioned as one of the places which produced various silk garments, such as ksauma, dukula and patroma. Historians are of opinion that this Suvarna Kundya is no other than modern Sonkudih in the district of Kamrup. From the evidence of the 'Arthasastra', 'HarshaCharita' and other classical writers, it is inferred that in the art of rearing silk worms and the weaving of the best kind of silk cloths, the weavers of ancient Assam had earned reputation equal to that of the Chinese. Later-day writers like Quazim observe that Assam produced the finest silk cloths similar to those of China. Dionysius refers to the Tassar silk of Assam. According to Travernier, the silk of Assam was produced on trees and the silks which are made of these trees are very brilliant. Hunter makes an exhaustive survey of the silk industry of Assam. According to him, "During the supremacy of the Ahom dynasty the industry was greatly encouraged and grants of lands were conferred upon the Jogis or weaving caste who were also exempted from the personal labour exacted by the state from all other classes. This caste produce the mulberry
silk worm and the produce was for the exclusive use of the royal family. (?)
The climate is eminently adapted to the vigorous growth of mulberry and other silk-producing trees and plants." It is true that the silk industry was greatly encouraged by the Ahom kings. The Ahom king Shuteupha (A.D.1268 - 1281) in order to increase the production of silks, such as mulberry silk, Mejānkarī, and Muga, appointed one thousand pāiks from the Chutiā and the Kachāri community to rear silk moths. Under the patronage of the Koch kings also the silk industry made a considerable progress in the Koch kingdom. From all these facts we can come to the conclusion that the silk industry has been continuing in Assam since the days of RāmaRāmâyana and the silk fabrics that were produced in Assam received great favour in India and in other parts of the world.

Dr. I.Tazima, the Japanese expert, who recently visited India, in his report on the development of silk industry in India, makes a glorious statement in praise of the silk industry of Assam. He writes, "Sericulture in Assam presents quite a unique feature among the sericultural states of India. Here, unlike in other states, the major rearing is of 'Eri' silk-worm - Attacus ricini and Muga silk worm - Antherea assama..... An advantage in the Assam sericulture is that it has some background among the rural people inhabited there. Sericulture provides profitable and good subsidiary occupation to the farmers and their family at home throughout the year. Most of the farmers are weavers as also consumers themselves." Now, there are three kinds of silk worms that are produced in Assam. They are: The mulberry silk worm, the Muga and the Egi. We will now proceed to discuss about them one by one.
This kind of silk worms are fed with the leaves of the mulberry trees and so they may be termed as mulberry silk worms (bombyx textor). In Assamese they are called 'Pāt-palu'. The silk threads produced from the cocoons of this variety of silk worms are the finest of all "with a mixture of white yellowish tinge". The mulberry silk worms are again of two kinds, one is called 'Bar-pāt' and the other is called 'Saru-pāt', i.e., big and small respectively. The worms known as 'Saru-pāt' (i.e., the small variety) can be reared from two to six generations a year. But generally two generations are reared and they are in the months of Kāti (Karttiika) and Jeth (Jyaistha); so the two varieties are respectively known as 'Kātiā' and 'Jethuā'. The worms known as Barpāt (i.e., the big variety) are reared in the month of Chat (Chaitra) and so this variety is known as 'Chatuā'. The cultivation of the worms is a long drawn process and it requires a great deal of care and attention. They are reared within doors. A separate hut is constructed with special care for the ventilation of air and for the protection from animals and insects. Such a hut is "filled with bamboo stages, with a passage left all round, between them and the outer wall". The huts are built generally in north south direction with only one door to the east. Like the Muga worms, the mulberry worms are not found wild. As to the rearing of mulberry silk worms and the spinning of its cocoons, which are still in existence in the society, Robinson gives a detailed description in his work. As regards rearing of mulberry silk worm there were certain restrictions from the society. Only some particular castes and communities were allowed to do this work. The cultivation of this variety of silk
worm was, so to say, a monopoly of the community known as 'Katani' or 'Jogi' about whom we have discussed. It is evident from the chronicles that the Ahom kings appointed some Chutias and Kacharis to rear mulberry silk worm, in order to increase its output. But other communities like Keot, Kalita, Kayastha were never allowed by the society to adopt the profession of rearing mulberry silk worm.

The silk cloth was considered pure and hence it was much preferred to cotton cloths in religious function. The cultivation of mulberry silk worm was a good subsidiary to those who cultivated it. The 'patrona' of the early period, with a yellowish white colour, mentioned in the 'Harsa-Charita' was no other than the mulberry silk or present 'Pat' of Assam.

c) Muga Silk worm (Antherea-assama): -

Assam alone can claim her superiority for the cultivation of Muga (Antherea-assama) and Edi (attacus ricini) silk worms. The Muga worms are mostly cultivated in the districts of Nowgong and Sibsagar. In other districts of the Brahmaputra valley they are also cultivated. The moths of this variety of silk worms are comparatively bigger in size than the other varieties and are found wild in the forests of Assam which are popularly called 'Deo-muga' by the people. But those which are cultivated are taken from the domesticated worms. The Muga worms may be regarded as semi-domesticated owing to the fact that they are reared both within and outside the house. The cultivation of Muga worms are not restricted to a particular community. The worms generally feed on the leaves of the 'Som' trees.

Though the 'Som' trees are found growing wild in abundance yet the people for the purpose of rearing Muga worms, specially nurtured these trees. The worms sometimes fed on the leaves of 'Dighalati', 'Fatisonda'
'Domlati' and 'Soālu' trees. But the silk produced from the worms which feed
on the leaves of the 'Som' trees are of better quality than those of
the former. Better qualities of Muga silk, such as 'Chapā-patia' and
'Mejānkarī' are produced from the worms which feed on the leaves of Champā
and Ādakuri trees respectively. These silks are costlier too. The garments
made of these two varieties of silk were worn only by the nobles and the
high ranking people of the society. Hamilton writes: "The silk called
Medanggori is reared in Assam proper on a tree that is cultivated, but of
what kind I did not learn, nor could I procure the insect. It is higher
priced than the Muga." Further he writes that the 'Mejānkarī' silk is
generally considered as better quality and constitutes the dress of the
higher ranks. They are sometimes dyed with lac also. Dionysius refers
to a kind of silk called 'Tassar'. Dr. Choudhury seems to make no distin-
cution between Muga silk and Tassar. In the chronicles of the Medieval
period we get ample references of Tassar silk. Among the various presents
sent to different kings and personalities of different places, Tassar silk
was also now and then included. The Tassar silk is a kind of Muga silk
which was produced from the variety of worms which feed on the leaves of
Kotkorā, Phutukalā or Bagari trees. The Tassar silk worm (Brahmaea) was
regularly reared by the Assamese people during the Medieval period and
silk was regularly produced from the cocoons of these worms. But now-a-days
the rearing of Tassar worm is completely abandoned by the people and are
found in wild state.

Within the course of a year, Muga worms are reared five times or in
other words, five generations of Muga worms are cultivated. They are gene-
really known by the name of the months in which they are reared; the gene-
ations are: (1) 'Jāruā' (i.e., in the month of Pausa and Māgha),
(2) 'Jeṭhuma' (in the months of ṇañiśṭha), (3)'Āhruma' (in the month of āṣadhā), (4) 'Bhadā' (in the month Bhādra) and (5) 'Katiā' (in the month of Kṛttika). But generally people get two or three crops only. The first and the last, mentioned above, are considered best both for their quality and quantity. For the cultivation, the cocoons brought from the districts of Nowgong and Kamrup, are considered the most valuable. The average duration of one generation from the hatching of eggs to the moths is about sixty six days in total. It is estimated that fifty thousand of cocoons are produced from a generation of Muga worms, fed on the leaves of the 'Som' trees of an acre of land; this fifty thousand of cocoons, in their turn, yield about twelve seers of silk which are considered a good annual return by a producer. The price per seer was about five rupees towards the advent of the British. As to the rearing of Muga worm there was no social restriction although the spinning of its cocoons was not considered dignified for the high class people. All people without any distinction of caste could rear this variety of worm and thereby they provided their families with additional income.

In the early period, the term 'Dukula' was perhaps used to mean this variety of Muga silk. In his 'Arthasastra', regarding 'Dukula', Kautilya states that the best quality was from Suvarṇakuṇḍya and it was "as red as the sun, as soft as the surface of the gem, woven while the threads are very wet and of uniform or mixed texture." The process of weaving makes us doubly sure that it was no other than the present Muga silk of Assam. The process of weaving the Muga threads while they are wet is still in vogue and the cloth thus woven is known as 'Tita-kariā' in Assamese. As said above, the Muga culture is a special feature of sericulture in Assam.
It will be shown below that during the Medieval period, this industry has brought annually a lot of foreign exchange to the State.

(d) The Edi culture (Attacus ricini):

The culture of Edi is also another indigenous industry for which Assam can alone be proud of. The Edi worms are reared indoors and great care is to be taken for cleanliness. The worm is called Edi because of the fact that they are mostly fed on the leaves called Eda (Palma Christi), in Assamese; but they also feed on the leaves of a kind of tree called 'Kecheru'. The Edi worms can be reared round the whole year. In the summer season the duration of the generation is shorter than in other seasons and the quality also proves better. In the summer season the total duration is about forty three days and in the winter season it goes up to two months. It is not possible for all people to rear mulberry silk worm and Muga worm. Because in the first case there is a caste bar and in the second case, though there is no such caste bar yet it requires a great deal of labour. In the case of the Edi culture, though there is no strict restrictions, the high-caste people like Brahmins and Kayasthas are not allowed by the society to cultivate this variety of worm. However, people donot seem to follow this restriction strictly.

The Edi muga is cultivated in the whole of the Brahmaputra valley besides being cultivated by some of the hill tribes. In the whole year up to seven generations, the Edi worms can be reared; but generally three to four generations are reared. The women of the family are entrusted more with the charge of rearing this variety of worms than the males. Hamilton says that the silk called 'Erendi' was reared on the Ricinus in great quantity as in Ranggapur. It is believed that the cultivation of Edi worm has been in
existence since the early period. The 'Kṣauma Vastra' sent by Bhaskarvarma to Harsa among other presents as mentioned in the 'Harsa-charita,' is believed to be no other than the present Edi silk of Assam. The 'Harsa-Chariti' mentions the colour of the 'Kṣauma' as white with a yellowish tinge. The Edi cloth is usually white with a yellow tinge. Therefore, it leads us to believe that in early period, the Edi silk was indicated by the term 'Kṣauma'. There are scholars like K.L.Barua, B.K.Barua and P.C.Choudhury who interpret the meaning of the term 'Kṣauma' in different ways.

2. Cotton Fibres, Hides and Hairs

The other weaving products were cotton and fibres of some plants and trees. From the hides and hairs of some of the animals, garments were generally made by the tribes living in the hills. Cotton was cultivated throughout the whole country. It was more extensively cultivated by the adjacent hill tribes; but little was used by them. The hill tribes bartered it for other commodities with the people of the plains who spun threads out of it. Besides, the tribes, under the supremacy of the Ahoms, had to offer annually a certain share of the commodities produced in their regions to the Ahom kings as revenue. Among these tribes, who cultivated cotton most, the Garos, the Nagas and the Mikirs are worth mention. The people cultivated a number of plants and trees for the purpose of extracting fibres. Of these plants and trees the most important are the jute, the Phnopāt, Sonpāt, Rhea, Elāboi, Kukursutā, Bhedeli latā and Sonbariāl. From the fibres of the jute, ropes were made for different purposes. From the fibres of the Rhea, bags, cloths and riggings for the tents were made and from the fibres of the Elāboi, big ropes and coarse cloth were prepared. From the fibres of the plant, called Kukursutā, stiff cloths, angling threads and ropes were prepared.
Besides these, many other things were made from the fibres. The Abors have made their shirts from the barks of a kind of plant, called Chorāt (a species of devil's nettle) and the Garos also have made a kind of warm cloth from the barks of the trees. The hill tribes were very expert in spinning or preparing threads from the fibres of the barks of the plants. The barks of the trees called Sanci were used for the purpose of writing about which we will discuss in a relevant chapter. 26

Cotton was also used in the purpose of making mattresses, pillow and other sorts of cushions for different purposes. Cotton was collected from the trees called Kapāh, Simalu (Salmali), Akan (Akanda), Maduri (a kind of grass from which mat is also prepared) and Chewā (a kind of sago palm) for different purposes. 27 The cotton collected from the Simalu tree, which is known in Assamese as 'Tulā', was used for the purpose of making paper also. Therefore, the writing paper made from the Simalu-cotton is called 'Tulā-pāt', in Assamese. We have seen many manuscripts the parchments of which are made of Simalu cotton. 28 The early use of cotton as a writing material is proved by some old Assamese manuscripts. Writing material was produced by pressing cotton so as to make it into something like a sheet of paper. 29 Tulā-pāt or paper parchment made by pressing cotton was generally used for manuscripts of inferior merit.

The hides of deer, tiger, lion, bear and python were used in making seats. Sometimes after being tanned, they were exported to other places. The leathers of the cows and buffalos after being dried and tanned were used in making various musical instruments and string. Uniforms for the soldiers and shields, known as 'Bāru' in Assamese, were made of rhino hides. An instrument, known as
'Chamatā', for punishing the wrong doers, was made of leather. Skins and leathers were also used in making masks for the actors. The manuscripts written in honour of Manasa Devi, the goddess of snakes, were sometimes wrapped in cobra-skins.

3. Spinning and Weaving:

Spinning and weaving was universally practised in Medieval Assam. Under the supremacy of the Ahoms they were included in the compulsory works allotted for the women. In 'Fatiyah-Tabriyah' it is said: "The people were very skilful in weaving embroidered cloth." Every evening a woman had to spin at least five 'Sutalamis', i.e., five conical balls of threads. Francis Hamilton says: "The native women of all castes, from the queens downward, weave the four kinds of silk that are produced in the country, and with which three-fourths of the people are clothed. Considerable quantities of the two coarser kinds are exported. There may be one loom for every two women; and in great families there are eight or ten, which are wrought by slave girls. The raw materials is seldom purchased; each family spins and weaves the silk which it rears, and petty dealers go round and purchase for ready money whatever can be spared for exportation or for the use of the few persons who rear none of their own. There were many looms in the royal harem which were wrought by the female attendants. From the biographical records it is learnt that the mother of Bhawanipurā Gopal Ātā, who was very expert in weaving, was entrusted with the charge of superintending the twelve score of looms that were in the royal harem during the reign of the Ahom king Shuhrungmung, alias Dihingia Raja. Even some of the Ahom queens were personally in charge of training the young girls as well as looking after the activities of the looms which were in the palace. King Siva Singha's consort
Sarveswari, alias Anadarl, was such a queen. The Govt. appointed some persons to supply with raw materials for the looms of the prominent queens of the Ahom kings. Further, there were higher officers appointed by the state to supervise the activities of these people. The Raidangi Phukan and the Raidangi Barua were under the Raidangi queen to manage her estate as well as to see the activities of the paiks who were in charge of supplying yarns and other raw materials for the looms of the queen. In the same way, under the Parbatia queen there were the officers known as Parbatia Phukan and Parbatia Barua for such works. In his monograph on cotton fabrics of Assam, H. Samman writes: "The Ahom Rajas kept skilful weavers to supply the royal wardrobe with cloths and it is related how in the reign of Purandar Rajah one Madhuram Tanti excelled all other weavers of the day and was for his services to the royal family, granted land rent free by the king." 34

The existence of the professional weavers is known from the earliest times. In the Medieval period fresh weavers known as Tantis and Jolās have migrated from other parts of India and have made their permanent settlements here. The Mohammedan weavers were known as Jolās. In the district of Kamrup there are villages completely inhabited by professional weavers. In the Koch kingdom, for sometime, Sankardeva was appointed a 'Gomosta' by king Naranarayana to supervise the weavers. During the period of his Gomosta-ship, Sankardeva, for the pleasure of the king, caused the weavers to weave the 'Vrindavani' cloth wherein the activities of the Lord Krishna in Vrindavana were woven in texture. 35 We have said above that in the period of our discussion, the spinning and weaving was the main profession of a community of people called 'Katanil' or 'Nath'. In connection with the discussion of the position of women and dress and ornaments it is said
above that most of the Assamese women were expert weavers. Within a night they could complete the piece of cloth known as 'Kavach-kāpor' by spinning threads for it and weaving the threads into the cloth. From the literary records and the marriage songs we know that they could spin very fine and thin threads and when such threads are woven into cloths they become so light and thin that the piece of the garb garment can be concealed within the grip of the hand.

4. Embroidery:

It has been the practice of the women to embroider their various pieces of garments and cloths, such as 'Khaniā', 'Cheleng', 'Rīhā', etc. For their embroidery work they use coloured threads, Muga, gold or silver threads. The piece of cloth which is used to cover 'Singhāsana' (at the altar of god of the chapel) and generally known as 'Gosain-kāpor', is profusely embroidered with the designs of flowers and trees; sometimes, verses from the much revered 'Naṅghoṅā' and 'Kirttana' are also woven there. Even the incarnatory figures of God and the activities of Lord Krisna in Vṛndāvana, as recorded in the literary and biographical works, are woven into designs of the cloths. According to Hamilton, the Mosquito curtains were also decorated with embroidery works. The best silk scarf, Rīhā and Mekhīlā of the best silks were embroidered with gold or silver threads and the varieties were known as 'Kārcipi-Kāpor' or 'Gūṅār Bankarā Kāpor'.

At the time of the Ahom king Shuhungrung, among the captured Mohammedans, there were many Mohammedan artists who were established in the Khel’s (guild) of 'Gūṅakatiā' and 'Cholē-sīṅ'. These artists could make gold and silver threads and also could do embroidery works of gold and silver strings. During the reign of king Jayadhvaja Singha, Mohammedan experts in gold and
and silver embroidery work were brought from Delhi and were established in Assam. From these experts large number of Assamese people learnt this industry. But unfortunately the industry is now lost in Assam; there are still villages by the name of 'Gunā-katiā' only to remind us that their ancestors were expert manufacturers of gold and silver threads and could do embroidery work in fine cloth during the Ahom rule. About the extinction of this industry in Assam, H.S. Samman, in his monograph, writes: "In former days the gold and silver wire (guna) used for embroidery was made within the province by a class of workman called 'Gunā-katiā'; the process of manufacture was a trade secret, and no information concerning it has been procured. This is all the more regrettable as the class of 'Gunā-katiā' is rapidly becoming extinct and such men as still retain the name depend no longer on their professional occupation for a livelihood, but have taken to agriculture or other more profitable employments and are fast losing or have lost already entirely their knowledge of the art for which they were once so famous". According to Quazim, the Assamese people are expert in weaving velvet cloths and embroidery works.

5. Dying:

According to a latter-day writer Francis Hamilton there were no dyers nor printers of chints in Assam. The women who weave their cloths, mix colour it themselves. Though there were no professional dyers in Assam yet the art of dying was quite known to the people since the very early times. Bana mentions that Bhaskara sent coloured and painted cloths to Harsa. 'Kalika purana', in connection with the worship of gods and goddesses, refers to the use and manufacture of coloured cloths. According to Travernier, the people of Assam produced sufficient shellac of a red colour with which
they dyed their calicoes and other stuffs and by extracting the red colour they used the lac to lacquer cabinets and other objects. In the Medieval period, we have seen that the manufacture of dye was in practice among the people for different purposes. They coloured their different pieces of garments. Besides, colour was used in painting-works, colouring cabinet works and sundry other things made of wood, bamboo and cane used in domestic life.

People had their own indigenous method of manufacturing dye. For colouring the wooden works yellow orpiment and vermilion or cinnabar were used. The materials from which the women of Assam manufactured dyes were lac, indigo, Achu-plant, Manjit (Indian madder) and Kendu. The leaves and the fruits of the trees called Tepor and Jaradhur are also used for the purpose of colouring cloths. The Manjit or Majāthi, as it is known in Assamese, is a red coloured creeper and was largely supplied by the hill-tribes of the North-east regions of Assam. The roots of the plant called Achu are yellow and their extract was used for colouring threads or cloths. The dye that is obtained from the seeds of Kendu trees is generally used to colour fishing nets. The process of colouring with indigo is very simple. The Indigo was mostly cultivated by the Mikir people. The most important dye of Assam in those days was lac with which silk cloths were coloured. The process of colouring with lac is as follows: The lac is first exposed to the sun to render it brittle. Then it is ground and sieved very fine. The powder is then thrown into basin of water and allowed to stand for twelve hours. The thread is then steeped in it with a few leaves of a tree, called 'Leteku' in Assamese. When the thread has absorbed sufficient quantity of this solution, then it is taken out.
and dried in the sun. This process is repeated twice. To give the thread a higher colour, it is again dyed in the munjít which is reduced to powder and thrown into a bowl of water; the thread is allowed to stand for forty-eight hours there. The thread is then put in and boiled together with the leaves of a tree called 'Hoh'. After this the thread is dried in the sun and becomes ready for use.

6. Wooden Works:

The forests of Assam are noted for their valuable woods, bamboos, canes and other natural products. Since early times, Assam has been known for her wooden works. The art of wood-carving is proved by early writers like Bana. Local grants also indicate the existence of wood-carving in the early times. Wood was used for the making of icons also. A later-day source 'Fathiyah-1-Ibriyah' mentions about boxes, stools, trays and chairs which were made from a single piece of wood.

Wood-carving was carried on to a great extent under the management and patronage of the kings and the Satra institutions. There were also individual carpenters in the villages who made different kinds of wooden works for the use of the village people. The carpenters, in Assamese, are generally called 'Badhai' or 'Khanikar'. Some of the Ahom kings invited many Mohammedan Khanikars and established them in the 'Khanikars' Khel' (guild). There are still villages known as 'Khanikar Gaon', the inhabitants of which during the Medieval period were carpenters. The services of the carpenters or the Khanikars were requisitioned for construction and painting works in the palaces, Namghars and houses. There are remarkable descriptions of posts and beams, particularly used in the palaces and Namghars of the Satras and villages, both in the historical
and in the literary works. Shihabuddin, describing the great audience hall in Gargaon, writes: "It stands on 66 pillars, each of them about 4 cubits round. They have smoothed these large pillars so well that at first sight they seemed to have been turned on a lathe. My pen fails to describe in detail the other arts and rare inventions employed in decorating the wood work of this place. Probably nowhere else in the whole world can wooden houses be built with such decoration and figure-carving as by the people of this country. The sides of this palace have been partitioned into wooden lattices of various designs carved in relief, and adorned both within and outside with mirrors of brass polished, so finely that when the sun-beams fall on them, the eye is dazzled by the flashing back of the light. This mansion was completed by 12,000 men working for one year." The Ahoms were expert wood-workers. According to R.M. Nath, the Ahoms had their efficiency in wood works perhaps owing to their ancient connection with China. He is of opinion that under the domination of the Ahoms the stone sculpture of Assam was replaced by the solid wood carving.

The art of making wooden sculpture was specially cultivated under the influence of the Vaisnavite Satras. The wooden posts and beams of the Namghars in the villages and in the Satras were decorated with figure-carvings and illustrations both carved and painted. This point has been elaborately discussed by Dr. B.K. Barua and R.M. Nath in their works. Dr. S.N. Sarma writes that the art of painting and wood carving is an important contribution of the Satras.

The Ahom Government had a large number of war-boats under the naval commandar known as Paniphukan. The boat building industry was highly developed in Assam. There were numerous 'Nāo-jāals' or dock-yards for building boats. The vast forest resources supplied excellent timber for boats. There were dock-yards for the construction of boats at the places,
such as Pandu, Gauhati, Kaliabor, Biswanath, Dikhaumukh, Rangpur, Gargaon, Lata-sil, Sakbari etc. Innumerable boats were always kept ready in these dock-yards. It is recorded that Captain Welsh took away with him twenty thousand boats of various size and shape. Further at the time of Mirjumla's invasion about twelve thousand boats in the Gargaon dock-yard were burnt to ashes. An estimate of the boats that used to pass between Bengal and Assam at the time of Mirjumla's invasion, is recorded by Shihabuddin. He writes: "They build war boats like the 'Koshas' of Bengal and call them 'Bacharis'. There is no other difference between the two than this that the prow and stern of 'Koshas' have two projecting horns, while those of the 'Bachari' consist of only one levelled plank and as aiming solely at strength they build these boats with the heart wood of timber, they are slower than 'Koshas'. So numerous are the boats, large and small, in this country that on one occasion the news-writer of Gauhati reported in the month of Ramjan that up to the date of his writing, 32,000 'Bachari' and 'Koshas' boats had reached that place or passed it. The number of boats that conveyed the imperial army and those inhabitants of Assam who accompanied the Nawab (Mirjumla) on his return probably exceeded the number mentioned by the news-writer. Probably half of these were owned by Assamese. They build most of their boats of Chambal wood; and such vessels, however heavily they may be loaded on being swamped do not sink in the water." According to the size and shape and the service rendered by the boats, the boats are known by different names, such as Chara-nao, Bachari, Panchai, Kapikal, Haikali, Magarlagoa, Hilai-chara, Sihu, Jap-nao, Chilapati etc. The boats were very strong and sometimes beautifully decorated with carvings and paintings. During the reign of king Rudra Singha, Sandikoi Barphukan, the viceroy at Gauhati, introduced a new Khel (guild) of boat-plyers called 'Magari-chara'. The boats used by this Khel (guild) were specially decorated by erecting two wooden-heads of Magara at the two ends of the boat. From the literary records, it is
Wooden Works.

Wooden Saurai:

Kokara o Gaó:

Tamuli Pira:

= Page - 348 =
evident that the boats which were loaded with merchandise and were out for trade, were constructed with best timber and were very strongly built. Some boats were constructed with decorative designs on them.

The carpenters made various instruments and utensils for the daily use of the people since early times. They are the sleeping and sitting apparatuses, weaving instruments, agricultural implements, mortar, peddle for husking paddy, 'kuhīyar-sāl' (an indigenous sugar mill), telpā-sāl, or ghānī (an indigenous oil mill), box-trays called Sarāl in Assamese, stools, singhasana (an ornamented wooden seat supported by sculptured wooden lions), garud-sāna (an ornamented wooden seat supported by wooden sculptured Garuḍa), palanquins, called Dōla, Bhogjārā (water vessel) and many others. The Satra institutions were the main centres of wood craft during the Medieval period. Under the Ahom Government, there was an officer known as Khanikar Barua, who was in charge of the Artisans known as Khanikar or Baḍhail.

7. Bamboo Works:

The forest of Assam abound in various kinds of bamboos. The Bamboo Craft also has a long history going back to the very early times. From the 'Hārṣa Charitā' of Bana, it is known that bamboo craft was highly developed in Assam at that time. According to 'Hārṣa Charita', Bhaskara sent to Hārṣa baskets of variously coloured reeds, thick bamboo tubes, and various kinds of birds in bamboo cages. Bamboo was mainly used for the construction of houses. Various kinds of fishing instruments, weaving instruments, utensils and instruments used in the daily life of the people, such as baskets, platters, sieves, combs, masks and artificial weapons used in the theatrical functions are made of bamboo.
Bamboo and Cane Works.

BA-TOWA CHUNGA

PACHI

KHALANI

Dola

CHEPA

POLO

Page 349
8. Cane Works

Canes are in great abundance in the forests of Assam. In connection with cane industry in Assam in the early period, Dr. Choudhury holds the view that the abundance of canes in the forests of Assam is supported by the classical writers. Ptolemy states that the east of Serica which is identified with Assam, there were hills and marshes, where canes were grown and used as bridges. Evidence of the production of other cane articles is also found in 'Harṣa Charita'. The hill tribes, particularly of the North-east region of Assam, construct bridges with canes even to-day. The cane is used in the construction of houses also. A large number of artisans make artistic house-hold materials, such as Sarāi (raised tray), Bāṭa (tray), Japa (box), Petāri (box), Bichani (fan), Kuki (flower basket), Khalai (basket for keeping fish), Tonā (a long wicker or receptacle for fish), etc. are made from cane.

9. Mat Making

Another small scale industry is that of mat-making. Early literature refers to the well-decorated 'Sitalpāṭīs' used by the aristocratic people. In the Medieval period, mats were made of different substances, such as 'Paṭi-dai' (mat-rush), 'Muthā' (a kind of long grass) and 'Kuhila' (sola). Reference to well-decorated and coloured 'Paṭīs' are found both in the marriage songs and in other literary records. From the chronicles we know that the Chutiaś and the Kachariś used to present the Ahom kings with decorated and coloured 'Paṭīs'. Even to-day many Assamese people are used to make mats for the purpose of both sleeping and sitting. The 'Mer-dhara' is an artistic and labouriously made seat usually offered to the high ranking or respected persons of the society. There was a class of people known as 'Paṭiyā' (mat-maker) whose profession was that of making of mats.
from the mat-rush (vide chapter- Social Divisions). As regards making of mats from the rush, there was perhaps certain social restriction, but there was no such restriction with regard to making of mats from the 'Kuhila' or 'Mutha'. Another kind of mat, which was of a coarse variety, was also made from 'Ghogol', a kind of long stuffy shrub which usually grow near foggy places. Hamilton writes, "Many people make mats; some are made of a species of Thalia, and some are made of sola or Aeschynomene diffusa."

10. Thatch and Palm Leaves (Kher and Takaupat) :-

Thatch and Palm leaves are mainly used for thatching the houses. People used to make from thatches long ropes and a sort of fan. The palm leaves were used in making different kinds of fans and different kinds of native hats called 'Japi'. Sometimes Takau leaves were also used to cover the frames of the 'Arowans' (a flat round bamboo frame used by the kings and the nobles of the State as an umbrella) and the 'Chais' (used as a shed for shelter from the rain and sun in the boat). A kind of coarse thatch known as 'Kahua' was used in constructing temporary sheds etc..

11. Manufacture of Aromatics :-

About the manufacture of aromatics in early Assam, Dr. B.K. Barua and Dr. P.C. Choudhury have already elaborately discussed in their works. References of the existence of Sandal wood and aloe-wood in Kamarupa are found in the epics. References of these aromatic woods are found in the 'Mahabharata', 'the Arthasastra' of Kautilya and in the 'Harsa Charita' of Bana. During the Rājasuya ceremony, the Pāṇḍavas received from Prāgyotīsa the Sandal and aloe-woods among other presents. From Kautilya, it is learnt that Sandal wood was found in abundance in Kamarupa and there were different varieties of it with different colour and different odour, such as...
Jongaka, Grameruka, Aupaka or Japaka and Taurupa. Similar mentions of aloe-woods are also found in the 'Arthasastra'. The varieties of aloe-woods called Jongaka and Dongaka are of the best kinds and of best colours.

References of aloe-woods are found in 'Raghuvamsa' and 'Rajatarangini' also.

In the chronicles of the Ahom period we get numerous references to aloe-wood. Scented oil extracted from the aloe wood and other ingredients was used (vide chapter - Marriage and position of women). A kind of resin called 'Dhuna' extracted from a kind of trees was used for burning as incense or in medicine or in preparing a type of cement, called 'Kadhal'.

We have already discussed about 'Gandha-kalai', i.e., deer musk, elsewhere in the book. Assam was famous for deer-musks from the earliest times. As indicated in the 'Harsacharita', Assam has been producing the best type of musks from the early times. From the 'Kalika purana' and 'Arthasastra', it is evident that other types of perfumes were also produced in Assam.

12. Forest Industries

Of the different forest products, the lac, majathi (Indian madder), dhuna (resin), gandhaka (sulphur), etha (gum) and bih (poison) are the main. Of these we have discussed about lac, majathi and dhuna. We now discuss about etha (gum) and bih (poison) only. Under the patronage of the Ahom Govt. the cultivation of trees that produced etha, i.e., gum, was largely made in the country. There were different varieties of etha collected from different kinds of trees. These are 'Ahom-etha', 'Bara-etha' (gum collected from trees called Bara, i.e., Ficus Indica), 'Kendu-etha' (gum collected from the trees called Kendu) etc. It is not known where from the gum called 'Ahom-etha' was
collected. Under the management of the State, there were farms called 'Ehā-bāri' in upper Assam, where the trees that produced gum were cultivated in large number and gums were also collected and manufactured regularly. The hill people used to send gums as revenue to the Ahom kings. During the Ahom rule gums were exported in other countries in large earthen pots. According to Robinson, gum was mostly collected from the trees called 'Baragach' (Ficus Indica) and they were largely grown on the northern frontier of Assam, specially in the northern side of the district of Darrang. Robinson gives a detailed description as to how gums were collected. Further he says that the Assamese people who were in charge of manufacturing gum from the juice of these trees, kept secret the process of cleansing the gum. This is probably one of the reasons for which the process of cleansing the gum is now lost in Assam.

The last but not the least is the 'bih', i.e., poison. Poison was supplied by the Bhutias, the Tibetan Lamas and specially the Mishims of the north-east region. The Mishims who were in the habit of frequenting the markets of the plains, near modern Sadia, used to bring with them Lama swords, spears, Mishimi-lītā (coptis Tita) and a considerable quantity of vegetable poison. Among the different varieties of poisons, the 'Bichā-bih', the 'Bar-bīh' and the 'Kani-bih' are the main. The 'Bicha-bih' is so called, perhaps because it was supplied by the Bicha (a tribe) people. The 'Bar-bih' is the vegetable poison supplied by the Mishims and the 'Kani-bih' is locally obtained from a plant of the same name, the roots of which are very poisonous. Poison was extracted from the Cobras also. Besides poisoning the arrows and cloths, it was also used in medicine.
Assam has been known for her elephants and rhinoceros from the early times. That the forests of Assam were abundant with elephants is proved by the local epigraphs of the early period. The epigraphs make reference to the elephants' pearls. The classical writers also referred to the abundance of elephants and rhinoceros' horns. From the account of the Chinese pilgrim Yuan Chwang and 'Harsa Charita' of Bana we know about elephants, elephants' tusk and rhinoceros' horns. Among the presents sent by Bhaskara to Harsa, Bana mentions "ring of hippopotamus ivory encrusted with rows of huge pearls from the brows of elephants". The fact that the kings of early Kamarupa accepted the symbol of elephants as their royal insignia, proves the abundance of elephants in Assam.

As has been said above, during the Medieval period, Assam was famous for elephants. It is evident from the historical records that the outsiders, particularly the Moguls, had coveted very much Assam's aloe-woods, gold-dusts, elephants and elephants' tusk etc. During the reign of the Ahom king Pratap Singha the Moguls came to invade Assam for elephants, gold-dusts, black pepper etc. Such instances to justify the abundance of elephants in Medieval Assam, can be cited from the chronicles written during the Ahom period.

It is stated in the chronicles that the frontier tribal kings supplied to the Ahom kings a large quantities of ivory and elephants' pearls annually. It is believed that a kind of pearl known as 'Gajamukta' were obtained from the brows of the elephants. As stated in the chronicles, the Kachari kings used to bring rhinoceros' horns and ivory stools to the
Ahom kings. The Singphos used to bring ivory in considerable quantities.

According to Hamilton, ivory worth Rs. 6,500 were exported to Bengal.

From the earliest times there were experts exhibiting their workmanship on ivory and horns and bones of other animals, in Assam. During the Medieval period, some other ivory workers, particularly Mohammedans, were allowed to come over to Assam and to settle here permanently. Ivory workers existed both in the plains and the hills. During this period various kinds of beautiful things were made of ivory. In the historical and other literary records we come across an exhaustive list of materials made of ivory. The common things that were made of ivory are different kinds of 'Piras' (stools), 'Phapi' (combs), 'Kakai' (comb), 'Ga-achora' (a kind of comb for scratching the body), different kinds of weaving instruments, holder of knives, both small and big, chess board, dice, different kinds of utensils, walking sticks, sculptural works, rings, boxes of various patterns etc. It is recorded that the Ahom king Jayadhvaja Singha sent to the Mogul Emperor Aurenzeb a mat made of ivory and a comb for scratching the body. (A mat, made of ivory, is still in existence in one of the principal Satras of Assam). King Kamaleswar Singha sent to the king of Bhutan, a para (box), a melā (?) and a khat, all made of ivory. It is learnt that there was a manuscript copy made of ivory which was taken away by an English gentleman never to return. About ivory works and others, Hamilton says, "They work in buffalos' horn and ivory. The horn makes one set of chess-man, the ivory the other. They make also a kind of tables used in gambling, and in which four persons play with man and dice, somewhat like backgammon. The same people make cups and toys of ivory." Hamilton further says, "The king has in his house some
men who make very fine mats, fans and head scratchers of ivory, all Chinese arts." Working in ivory is even now an extensive and one of the most artistic industries practised both in the plains and in the hills, particularly in Manipur. In the plains, the industry is largely carried on in the Barpeta Sub-division, in the district of Kamrup.

The Assamese people knew the process of straightening and softening the tusks of an elephant. The process is: the tusk is first covered with a thick coat of clay and cow-dung and then put it in the fire in order to make it soft. When it becomes soft, they split it into thin strips or cut it into pieces of different sizes and shapes according to their requirements.

(b) Working on Rhinoceros' and Buffalos' horn:

Like ivory workers, there were experts who could show efficiency in the artistic works on horns of rhinoceros and buffalos. The existence of this art in the early period is proved by the classical writers. In the 'Yogini Tantra', which is believed to be a work of the 16th century, it is stated that the use of utensils made of rhinoceros' horns in the środdha ceremony is considered to be the best of all. According to Gunabhiran, rhinoceros' horns were exported to other countries in large quantities. Further, people used to wear ornaments, specially rings, made of rhinoceros' horns. The Ahom kings used to send rhinoceros' horns among other presents to other countries.

The people knew the method of softening the horns of buffalos by boiling it in water. From the horns of buffalos, various kinds of materials for domestic use were made. The materials made of horns are 'Phani' (comb), 'Kākai' (comb), 'Pepa' (a sort of flute or pipe), holder of knife, rings etc.
As a piece of decorative work, the aristocratic people used to keep the horns of the deers artistically fixed on a piece of wood which was attached to a post in their 'Chorā-ghar' (sitting room). The tribal people in the same way keep the horns of the buffalos and bisons in front of their houses as decorative works.

The Assamese people used nails and teeth of some animals, particularly of tigers, as ornaments which were tied with valuable metals such as gold, silver etc. There is a reference in a biography about using nails, teeth and hairs of animals after binding them with valuable metals. In the same work it is stated that after they were bound with valuable metals, they become no longer impure for the use of people. As regards hairs it should be noted that large quantities of yak-tails imported from Bhutan were used as whisks by the people. The practice of using tiger-nail and tiger-teeth as ornaments and yak-tails as whisks, among the Assamese people, is still in vogue.

14. Stone Works:

The hills of Assam, specially those of the northern side of the valley, contain many kinds of valuable stones of different colours and shapes which supply the raw materials for the stone-workers of the country. The stones were carried to the plains through rivers by boats or by elephants. There were stone-workers under the management of the Ahom Government. The stone-workers were known in Assamese as 'Silā-kutīa' and above them there was an officer known as 'Silā-kutīa-Baruā'. The stone-works of the period consisted of various sculptures of deities, dolls, different kinds of utensils, grinding stones, cups, bed-stead, boat-shaped stone vessel for pounding herbal medicine etc. Some stone bridges were
also constructed in Assam. Of these stone bridges mention may be made of
the famous stone bridge on the river Namdang in the modern Sibsagar Sub-
division, the stone bridge at North Guwahati and the bridges on the rivers
Rahdai and Dimau. 89

The Kacharis had also left some stone works of historical importance.
Their stone-works are mostly found in the modern Dimapur territory and in
some other parts of modern Nowgong and Mikir Hill districts. 90 But the skill
showed by the artisans of the old Kamatapur kingdom is perhaps more remark-
able. The remains of the city of Kamatapur betrays excellent works of stone.
Describing the construction of the city H.N.Choudhury writes " The remains
of the city of Kamatapur are gigantic works of human art and bespeak great
power and wealth in the prince or princes who conceived such an idea of a
capital". 91

About stone works Hamilton writes that there were stone cutters who
could make plates, cups, and stone for grinding curry-stuff. 92

15. Lime :-

It was used mainly in construction works and for medicinal purposes.
It was also used along with betel leaf for chewing 'Tambula'. There were
people in Assam whose occupation was to prepare lime and sell or exhuage
it for other commodities. Lime was produced both from lime stones and snails.
When people found it easier to get sufficient amount of lime from the lime
stones, then they gradually began to neglect the other process, i.e., obtaining
lime from the snails. The pâiks who were in charge of supplying lime
then from the lime-stones, collected the stones from the hills and burnt
them in a place to produce lime. The place where lime stones were burnt was
known as 'Chun-chali'. The places called 'Chun-chali' near modern Gauhati
and 'Chunpora' near modern Sibsagar were such places where lime stones were
burnt for lime. According to the other process, the pāiks who were in charge
of collecting snails for lime, or people whose occupation was that of
preparing lime, collected the snails and then burning their shells, prepared
lime. From the records of Changrung Phukan who was in charge of the public
works deptt., it is learnt that large quantities of limes were consumed in
the construction of the temple, rampart, bridge, and the burial tombs of
the Ahom Kings called Maidam.

16. Pottery and Brick making:

The ancient relics and the epigraphic records prove that the art of
making pottery was fully developed in ancient Assam. As regards the
existence of the art of making pottery in the Medieval period, we have
already mentioned elsewhere about two classes of people known as 'Kumār'
and 'Hida' whose profession was pottery. In those days, the people generally
used earthen pots called 'Charu' for cooking purpose. Besides making
domestic utensils, such as Kalah, Ghaṭ, Takeli, Tipā, Charu, Malā, Bān, Sarāl,
Jaka, Tau, Nadiā etc., the potters also made earthen images, dolls, earthen
rings for the wells and earthen pipes for carrying water from one place to
another.

Brick making was also quite known to the people of this period and
this was a highly developed industry under the patronage of Ahom Government.
From the evidence of the relics, it is believed that this industry was known
to the Kachari people also. The bricks were made by different process and
the Assamese people could make strong and beautiful bricks of different shapes
and sizes with various designs on them. From the chronicle of the Changrung
Phukantit is gathered that in the construction work of the temples and tombs of the kings, bricks were used in large quantities. Bricks were used in the construction of the palaces and other buildings too.

In his little brochure 'Purani Asamar Silpa', Sri B.C. Handique attempts to describe in detail about brick making industry in Assam. It is believed that in those days the burnt bricks were coloured and made more strong and permanent by steeping them in the blood of the leeches. It is further believed that in the area called Jok-tali (jok = leech, tali = place where a certain thing or commodity is found or produced), near modern Sibsagar, there were leeches in abundance. For the purpose of collecting leeches, Buffalos were taken out to this place for grazing. When the buffalos would come out, the leeches were collected from their bodies and then cutting the leeches, their blood was used in colouring the bricks.

In ancient times, generally the 'Churki' was used for cementing the bricks; but the Assamese people had their indigenous method of preparing cement known as 'Kadhāl'. From the chronicle of the Changrungh Phukan it is gathered that 'Kadhāl' (cement) was made by mixing different kinds of lime, such as stone lime, lime prepared from the snails etc., molasses, fish, oil, resin, pulse known as 'Matimāh' and the fibres of flax.

17. Working on Metal and Salt:

During the Medieval period there grew up in Assam different industries dealing with metals like gold, silver, iron, copper, bell-metal, brass, lead etc. The royal powers, particularly the Ahoms, took much interest in the development of these industries with a view to making the country self-sufficient and economically viable. The mines of the country also supplied the different valuable metals for these industries.
Among the different kinds of metals gold was the most valuable. Gold dusts were abundantly found in the sands of different rivers of the State. About gold in Assam in the early period, different writers have elaborately discussed the process of gold washing in their works. References of gold in Assam, in the early period, are found in the writings of the classical writers. The earliest reference of gold in Assam is found in the 'Arthasastra'. Here reference has been made to a place called Suvarnakundya. From the Silimpur inscription it is inferred that the kings of early Kamarupa used to mint gold coins though unfortunately no such gold coins have yet been discovered. According to Periplus, "gold was brought into India through Tipperah country about 60 miles east of the Ganges delta, coming chiefly from the river washings of Assam and northern Burma". We come across numerous references about gold in Assam. According to Hunter, gold dust was found in the rivers Subansiri, Dikhau, Joglo, Dihang, Bharali, Dhansiri, in the river Sonai in Cachar and in Manipur and Khasi hills. The Sri Benudhar Sarma has stated that/tributaries of the Brahmaputra on the northern side contained more gold dusts than those of the southern side. The number of rivers containing gold dusts mentioned by Sri Sarma in his work 'Maniram Dewan' is larger than the number shown by Hunter and other writers. W. Robinson also states that "The best gold is said to be found in the most winding streams having the strongest currents". In this connection he has mentioned three rivers, viz., Boroli, Disni and Joglo. The latter two, according to him, "contain the purest and best gold".

* Boroli - Modern Bharali, in the district of Darrang.
Disni - Dichai, that is, modern Bhogdai, in the Jorhat Subdivision.
Joglo - Near Namchang, in the modern Dibrugarh Subdivision.
Under the management of the Ahom Government there were Fālks known as 'Sonowāls', washing out gold dusts from the sands of the rivers. The 'Sonowāls' mostly belong to the Chutiā and the Kachāri community. The Nagas also knew the art of gold washing. During the Medieval period it was the profession of the pālks called 'Sonowāls' to wash gold dusts for their livelihood. Each of the 'Sonowāls' engaged in his occupation had to pay a certain amount of gold to the State as tax. This annually brought a good amount of gold to the treasury of the Ahom Government. The Ahom kings in order to encourage the industry established 'Sonowāls' at different times in their kingdom. It is recorded that during the reign of king Jayadhvaja Singha there were twelve to twenty thousand of 'Sonowāls' and during the reign of Rajeswar Singha sixteen thousand in this business. Further it is found in the record that during the reign of king Jayadhvaja Singha about five thousand 'tolās' of gold came to the royal treasury. During the reign of king Rajeswar Singha, in addition to the usual tax of the gold washers, about six to seven thousand 'tolās' and during the reign of Gaurinath Singha four thousand 'tolās' of gold were yearly collected from the 'Sonowāls' of upper Assam. During the Ahom rule there was an officer, called 'Kheldār', upon every unit of gold washers. Substantial supply of gold was also made to Assam from the countries like Tibet, Bhutan, Khamti and Nara.

Besides making coins, a large amount of gold was used in making ornaments. We have already discussed about different kinds of ornaments made of gold. There were goldsmiths who made different kinds of ornaments from different metals. F.C. Hannikar in his monograph on "Gold and Silver wares of Assam" writes: "Assam jewellery is by no means without merit. It incurs

* Robinson, Hunter and Sri Benudhar Sarma - all these writers have given description of the process of washing gold in their works, viz., in 'A Descriptive Account of Assam', 'A Statistical Account of Assam' & 'Maniram Dewan', respectively.
the stock reproach of being "unfinished," it is no doubt crude, and precious stones used are not very precious or very well-cut. But it is quaint and characteristic. The gold used is of a high degree of purity. The Assamese goldsmiths' customers would not be satisfied with 14 carrot or even 18 carrot of gold and many of the bracelets, necklaces etc. are distinctly pleasing even to the critical eye and would attract notice in the midst of quite a good collection of Indian wares." Moreover, according to F.C. Henniker, there were a considerable number goldsmiths and dealers in the districts of Sylhet, Kamrup, Goalpara and Sibsagar. In the district of Kamrup, Barpeta was the well-known centre of its trade. In the whole of the province, Jorhat, in the Sibsagar district, was alone proud of enamelling work, known as 'Minā-kara' in Assamese. About enamelling work, Henniker writes, "Enamelling on gold is done mainly at Jorhat in Sibsagar district. The artificers are 'sunārs' and possess a fair amount of skill. As, however, they work almost entirely for the native trade, articles produced lack the finish to be seen in ornaments manufactured for European customers. There are many 'sunārs' in Jorhat who work in nothing but gold. These do not enamel but those who enamel also work in gold. The different families engaged in the enamelling trade are believed at present to number 38. The enamel (Minā) is usually of three kinds, a dark-blue, dark-green and white, but red and yellow are sometimes used. It is brought in blocks exactly like glass slag in appearance, from Marwari merchants. The price varies from 8 annas to Rs.2 a tola. It comes from Calcutta." Another important place where gold and silver work was carried on extensively was Barpeta. The place earned a great local reputation for its gold and silver work.

It is learnt that during the reign of the Ahom kings of the early part, the works done by the local goldsmiths were not very fine. So, king
Rudra Singha imported gold-smiths from Benaras for the manufacture of better quality of gold and silver ornaments. The Raja further selected some Kalita people to learn and to do the work. Formerly the 'Sonârs' were of the Kalita caste, but later on, as there was no restriction enforced upon, people of Keot and Koch community also learnt the work and became goldsmiths. The 'Hâdias' (scavengers) who had no other occupation to fall upon, took to the art of jewellery. We have, therefore, in the community of the 'Sonârs', people such as Kalita, Keot, Koch and Hâdi, in the Medieval period.

Gold was used by a class of people called 'Ganâkatia' who made threads from gold and silver and used in embroidery works on cloth (vide chapter - 'Dress and Ornaments'). Utensils made of gold, mainly used in the religious functions in the Medieval period, are still in existence.

(b) Silver Works:

References to silver in the early period are very scanty. 'Kalika Purana' (69/17-23) refers to ornaments made of silver and 'Yogini Tantra' (2/5/80, 290) refers to utensils made of gold. In the Medieval period though the working on silver was prevalent yet the metal itself was not available within the jurisdiction of the country. From the historical records and existing specimens it is learnt that the Ahom kings struck silver coins for currency in their kingdom. From the biographical works and other records it is gathered that there were silver mines in the Koch kingdom and in the south-east side of the Khasi Hills. From the lands of the Khamtis, Chinese and Singphos, annually a substantial amount of silver was brought to Assam. Under the management of the Ahom Government there were paiks known as 'Rupowal' to bring silver-soil from the south east side of the Khasi Hills and Burma. Silver was, then, collected from the
According to Robinson and Hunter, there were no silver mines in Assam except in the land of the Khantis wherefrom it was supplied to Assam.

According to Robinson, there was only one silver mine known to have existed in the land of the Barkhantis. This mine is said to have produced eighty thousand rupees a year. In former times silver was imported from China in great measure, in the form of bullion. This silver bullion was the only article of trade between the Assamese and the Chinese. 116

The same set of artists who worked on gold were accustomed to work on silver. Like gold, besides minting coins, silver was used in making ornaments, utensils, dolls and icons.

(c) Copper, Bell-metal and Brass Works :-

Copper—Early reference to copper in Assam is found in the Bargaon grant of king Ratna Pala, where an indication of the existence of a copper mine is found. From the inscription, it is learnt that the king had certain copper mines in his kingdom; the inscription says, "He delights in making his copper mines lucrative". 117

The working on copper is further proved by the existing remains of the copper temple, known as 'Tamrswari Mandir', near Sadia. 118 Copper-plate grants were issued by the kings of the Medieval period. 'Yogini Tantra' 119 mentions about utensils made of copper. In the religious functions, utensils, made of copper, are generally preferred.

During the reign of the Ahom kings, bell-metals were made by mixing copper and white tin called 'rãng' (in Assamese). From the 'Katha-Guru-Charit' it is gathered that copper was found in Assam and the trade of this article
was carried on between Assam and Kachhehar in those days. However, copper was not found in plenty in Assam. Substantial amount of copper was imported to Assam from China, Singpho and from the land of the Abors. According to Robinson, neither copper nor silver was found locally in Assam. A small quantity of copper was brought down occasionally by the Abors, a very troublesome people who used to visit the plains occasionally. From the historical record it is known that the Kachari king Tamradhvaja had brought with him copper and other metals to the Ahom king Rudra Singha while he was brought to Biswanath to pledge his allegiance to the Ahom king. According to F. Hamilton (1807-'14), copper worth Rs. 4800 was imported to Assam from Bengal.

Copper was mainly used in making utensils and ornaments. During the reign of king Rudra Singha, utensils made of copper were exported to other countries like Tibet and China.

Bell-metal - As said above, artisans knew the method of making bell-metal by alloying copper and tin. The use of bell-metal in the early period is proved by extant sculpture, utensils and ornaments. Since the early period, the Assamese artisans, particularly those of the Sarthebari of modern Kamrup district, are known for their artistic bell-metal works. References to bell-metal utensils and ornaments are found in the 'Mahika Purana' (69/17-23). In the 'Darrang Rajvamsavali' there is a reference to offering utensils made of various metals, such as gold, silver, copper and bell-metal to the temple of Kamakhya, by the Koch king Naranarayan. The 'Kathaguru-Charit' supports the existence of the working on bell-metal in the kingdom of Kochbehar.

During the reign of the Ahom King Shuhungmung, the Naras had to pay bell-metal, amber and long knife called 'Narā-da' as annual tributes to the
Bell-metal and Brass Works.

SARAI

SARAI

MANIPURI SARAI.

BATA

BAN

BERA Kahi.

DUNARI

BHOG JARA
Ahom king. The Assamese artisans knew the art of making utensils by using both the process of casting and beating. They have made the cannons, used by the Assamese soldiers, by mixing bell-metal, brass or copper with other metals. Shots for the cannons were also made by the same process. Sculptures and ornaments were also made of bell-metal during this time. Chilarai, the brother of the Koch king Naranarayana, once offered a pair of 'chappals' made of bell-metal to Sankardeva while the latter paid a visit to the Kochbehar State. From the accounts left by the foreign writers it is learnt that at different times utensils made of bell-metal and other metals were exported to different countries like China, Tibet and to the neighboring state of Bengal.

Brass - Owing to the want of evidence, it cannot be ascertained whether the artisans, like those of bell-metal, knew the process of making brass by alloying copper and zinc, but the existence of the working on brass is supported by facts. The Kacharis and other tribes offered brass among other metals as tribute to the Ahom kings.

Looking glasses, known as 'Darpan' (a variation of Sanskrit word - Darpana), either made of brass only or an alloy of brass, silver and other metals, were used in this period. Besides, many other utensils, such as Sarai (raised tray), Tau, Jakā, Chariā (washing bowl), Loṭā (water vessel), Kalah (water vessel of big size), Hetā (a ladle), Pishes etc. were made of brass which are still used by the Assamese people. The bell-metal workers, known as 'Kahār', were equally efficient in brass works also. But since the defeat of the Mohammedan invader Turbak, during the reign of Shuhungmung, the brass-work was taken by the Mohammedan captives of the war. These Mohammedans later on came to be known as 'Maria' in Assam.
References to the use of many other metals and precious stones are also found in our sources. The biographical and the historical works indicate the existence of tin, glass, borax, lead, mica, zinc, quick silver, amber etc. both in the kingdoms of the Koches and the Ahoms. From the chronicles it is learnt that the Ahom kings used to send these valuable metals among other presents to the allied kings and the chieftains of the hill tribes. The old remnants now and then discovered near Rangpur and Joysagar tank, in the modern Sibsagar Sub-division, bear testimony to the existence of the above metals during this period. But how and wherefrom these metals were procured, nothing can be said definitely. Perhaps these metals and many other valuable stones and jewels were brought to Assam by couriers from other parts of India where they were available. From the historical records it is known that towards the last part of the Ahom rule, king Rudra Singha sent people to different parts of India to bring different valuable metals, including precious stones, pearls and jewels. Further he imported artisans who were expert in the working of these metals and jewels and established them permanently near the capital.

Quick silver and amber was used in Assam to a great extent during the Medieval period. We have discussed elsewhere that Assamese people used to wear ornaments made of amber, amber was chiefly coming to Assam from the lands of the Naras and the Mishmis. Amber or Jāṅghpāi, as it is called in Assamese, was found in the lands of the Abors, Daflas, Miris and Nagas and they had to give it to the Ahom kings along with other commodities to be paid as annual tributes, as determined by the Ahom kings. It is believed that 'Rah' (quick silver) was constantly used by the people in making water clean in the large tanks. There are, still in existence, some tanks known as 'Rah-dhalā-pukhuri'.
(Rah = quick silver, dhala = pour, pukhuri = tank). The people, in those days, in order to dig a tank first selected a spot having a perennial spring of water. Then centring round the spring they used to dig the tank. Just in the centre of the tank, they dig a well into which they pour 'Rah' in order to make the water of the tank clean. This 'Rah' or quick silver was used in keeping the dead bodies of the Ahom kings in perfect state as a balm before they were entombed. The quick silver was used in the gold-washing industry also.

It is difficult to ascertain how and wherefrom this quick silver or 'Rah' was procured. It is believed that in those days there was a class of people who knew the process of extracting quick silver from the leaves of the 'Bel' (Vilva) tree (Aegle marmelos).

(e) Working on Iron:

We come across references to iron in the writings of Pliny, Ammianus Marcellinus and of the later-day writer Oldham. According to Oldham, "the Khasi iron was excellent for all purposes as the Swedish one and huge quantities were exported to other parts of the State either in lumps or in the shape of hoes." From the writings of the later-day writers, it is known that iron deposits were found in different parts of the State, particularly in the hilly regions, such as Khasi Hills, Manipur, Naga Hills, Garo Hills, Sylhet etc. The iron deposits at Jaipur in the modern Lakhimpur district, Barhat in Sibsagar district, and those of the Naga Hills and at Bacha Dayang, present Dayang valley in the Mikir Hills, were very prominent during the Ahom period. From Jaipur in the east to Bacha Dayang in the west, alongside the hills, there were many iron deposits which yielded huge quantities of iron annually to the State. Hamilton writes; "In the
territory called Bacha Dayang S.W. (south west) from Jorhat a day's journey, there is a mine. It supplies the whole country in abundance." W. Robinson also gives an elaborate description of the places where iron was found. He further points out that iron found in the Barkhamti country was the best and was manufactured to great perfection by a tribe called Kunungs. The agricultural implements made by this tribe was also of superior metal than those produced in Assam proper. The existence of iron deposit in the Koch kingdom is indicated by biographical works.  

Under the Ahom Government there were expert people to manufacture iron by melting and refining the iron-ore, procured from the mines. Sri Benudhar Sarma in his work 'Maniram Dewan' describes in detail the process of manufacturing iron from the iron-ores or iron-clays. The work of producing iron, in the mines, begins from the Hindu months of Aswina and Kartika. There were batches of people to work in the mines; every batch or unit consisted of one 'Ojāh' (head) and four 'Pālis' (assistants). Such a batch could produce iron weighing about one maund and 12 seers a day, working day and night. The people who produced iron from the mines were called 'Lo-salia' (Lo = iron, sal = workshop, salia = one working in the workshop). Their business was to produce iron only and not blacksmithy. There are large number of workshops for processing the pig-iron for procured from the mines. According to Maniram Dewan, under one Tiru Kakati, there were about 70 workshops or 'Lo-sals' to work in the mines of the Tiru Hill.

During the Ahom period, the agricultural, fishing and hunting implements, instruments for domestic purpose and weapons of war - including big guns and cannons were made of iron. During this period, the Assamese blacksmiths could show their efficiency in their craft; they were greatly encouraged by the
royal court. According to Maniram Dewan, one Bahi Khowa Phukan of Gauhati, presented king Rajeswar Singha, the biggest cannon made in the period which was 12 cubit in length and four cubits in circumference. Among the cannons, lying in front of the court at Sibsagar, the biggest one is believed to be the one presented by Bahi Khowa Phukan to the king. The name of one of these guns, lying in front of the court at Sibsagar, is inscribed as 'Ripunjaya' and it is inscribed there that during the reign of king Gadadhar Singha, by the order of the Sandiqui Barphukan, this cannon was made by one Garela Garia. Innumerable guns and cannons of different shapes and sizes were made by the Assamese blacksmiths during this period. From the records it is learnt that Mirjumla while returning from Assam, took away with him as many as 8788 guns including big cannons and big and small guns. King Rudra Singha had received 700 guns by defeating the Kacharis. According to Shihabuddin, the Assamese could cast excellent match locks and 'bachadar' artillery and showed great skill in this craft. They made first rate gun-powder. According to Maniram Dewan, cannons were first made at the instance of king Swarga Narayana in the Saka era 1427 (1505 A.D) and from that time onwards innumerable fire works were constructed up to the reign of king Rudra Singha (1606-1714).

Among the blacksmiths of Assam a section of blacksmiths known as 'Dhekar-garhā-kamār' were known for their skill in making 'dhekar' i.e., the crooked supports of palanquin or litters. The other blacksmiths were devoid of the skill of making 'dhekar'. We have said above that the Ahoms, after vanquishing the Chutias, brought many professional people including blacksmiths to their kingdom. According to Sri Banudhar Sarma the Ahom king Swarga Narayana established many blacksmiths in his kingdom, at different places,

* bachadar: Bachādār (bachadar / barsādār or barsādhārī, meaning one carrying a kind of long spear) means 'Chōdāng', i.e., body-guard.
providing them with workshops and other facilities. He appointed some officers, such as Hazarika and Saikia, to supervise their works. During his time, according to the findings of Sri Sarma, there were as many as 3,000 blacksmiths in his kingdom.\textsuperscript{147}

According to Hamilton iron hoes worth rupees 600 were exported to Bengal.\textsuperscript{148}

(f) Salt, Alkali and Salt-petre or Gun powder:

**Salt** - The manufacture of salt is an early practice in Assam. It is believed that the art of manufacturing salt was also learnt by the people of the plains from the tribes. The salt was manufactured either from rocks or from brines.\textsuperscript{149} The records and the writings of the later-day writers reveal that salt was found in Barhat (in Sibsagar Sub-division), Naga Hills, Cachar, Manipur, Mikir Hills and Sadia. Hamilton writes: "In the province of Sadijca is an important mine of salt, which in case of a dispute with Bengal, is the only supply on which the country can depend and the supply is scanty. It is under the superintendency of an officer, named 'Mahanghat Baruya' and produces annually 40,000 rupees. So far as I can understand the salt is found in the form of brine, by digging pools in a certain small extent. The water is evaporated by boiling and the salt is brought to Jorhat in the joints of large bamboos. It is purer and higher priced than the salt of Bengal. The mine is farmed and it is not wrought by the king's people."\textsuperscript{151} According to W. Robinson, brine springs were frequently found in the low ranges of the Naga Hills. There were about twenty wells of brine in the localities called Barhat, Nagahat and Jaipur. These wells were alternately wrought by the Nagas and the Assamese and the produce was equally shared between them. The wells afforded a very fair quantity of salt. Of all the brine springs those of Barhat
... and Sadia were the most known in the country. The revenue derived from the latter in the year 1809 amounted to about Rs. 40,000 per annum. The salt obtained from the springs was said to be purer and more highly prized than that imported from Bengal and which at one time amounted to no less a quantity than 1,00,000 Maunds. The most famous brine spring at Mahang, near Sadia, was under the Nagas. The Ahom king Shuhungmung took control of this spring in 1458 Saka era (1536 A.D.) by defeating the Nagas. Salt was received by the Ahom kings from the Garos, the Bhutias, the Abors, the Daflas, the Mishimis and the Khamis. Robinson in his work "Descriptive Account of Assam" and Sri Benudhar Sarma in his "Maniram Dewan" are describing the process of manufacturing salt in Assam.

"The manufacture is commenced in November and continued till March or April. Being situated in a valley the wells are subject to inundation during the rains. The process of manufacture is carried on by filling the joints of large bamboos with the water of the wells and then placing them over a flue to which a fire is applied; the brine in the bamboos is thus evaporated and dry salt remains. The bamboos are stripped of their woody covering, and only a thin scale of the inner wood is retained; and this being kept damp from the percolation of the brine, is not affected by the heat until the salt is nearly dry, when it is removed. One joint can thus be used over the fire three or four times."  

"A Descriptive Account of Assam" — W. Robinson.

In spite of having so many brine springs in the country, salt was very dear and difficult to procure for the common people. Besides, salt, procured from some of the brines was not good to taste. Shihabuddin writes that "salt is very dear and difficult to procure. It is found in the skirts of certain hill, but is very bitter and pungent."

Alkali - As salt was very dear and not easily procurable, the poor people had to use a kind of alkaline solution called 'Khāraṅ' or powder called 'Khār' in place of salt. The process of manufacturing alkali...
from the plantain trees and other herbs were universally known to the Assamese people. They use this alkaline solution of powder in their food, in washing cloths and in medicine. According to Shihabuddin, the people of this country cut the bananas to pieces and dry them in the sun. Then burning the dry pieces, put the ashes on a piece of fine linen which they tie to four rods fixed in the ground and place a pot underneath. Gradually they sprinkle water on the cloth and use the drippings which are extremely blackish and bitter as a substitute for salt. The alkaline solution or powder, prepared from the plantain trees, are respectively called 'Kal-Khārānī' and 'Kal-Khār'.

Saltpetre or Gun powder - Under the Ahom rules it was the duty of every Assamese family to supply a certain quota of saltpetre or gun powder to the State; therefore almost every Assamese man knew the manufacture of Saltpetre. Those who failed to supply it had to pay a certain tax for it. But the process of manufacturing Saltpetre in Assam is now completely forgotten. It is learnt that the people have been preparing saltpetre from their cowsheds or by other process which they supplied to the State magazine under the officer named Khargharia Phukan. According to Shihabuddin, the Assamese people could have made first rate gun powder. In the opinion of Travernier it was the Assamese people who first discovered both gun and gun powder and according to 'Fathiyah-i-Ibriyah' the gun powder used by the Assamese people were of various kinds.

REFERENCES

2. Ibid.... pp. 368, 364.
<table>
<thead>
<tr>
<th>No.</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>A Descriptive Account of Assam, By- W.Robinson,1841, p- 232</td>
</tr>
<tr>
<td>10.</td>
<td>Ibid..... p- 234.</td>
</tr>
<tr>
<td>11.</td>
<td>History of Civilisation of Assam, By-Dr.P.C.Choudhury,p- 367.</td>
</tr>
<tr>
<td></td>
<td>Account of Assam, By- Robinson, pp- 227.</td>
</tr>
<tr>
<td>24.</td>
<td>An Account of Assam, By- Hamilton, p- 59. A Descriptive Account of</td>
</tr>
<tr>
<td></td>
<td>Assam, p- 226.</td>
</tr>
<tr>
<td>27.</td>
<td>Ibid ........ pp- 58,59.</td>
</tr>
<tr>
<td>28.</td>
<td>History of Civilisation of Assam, p- 365. Descriptive Catalogue of</td>
</tr>
<tr>
<td></td>
<td>Assamese Manuscripts, By- H.C.Goswami, 1953, Introduction, XVI.</td>
</tr>
<tr>
<td>29.</td>
<td>Descriptive Catalogue of Assamese Manuscripts,Introduction,XVI.</td>
</tr>
<tr>
<td>32.</td>
<td>An Account of Assam, By- Hamilton, p- 61.</td>
</tr>
<tr>
<td>34.</td>
<td>Asamiya Bhasa Aru Sanskriti,By-Dr.B.K.Barua,1957, p -134.</td>
</tr>
<tr>
<td>35.</td>
<td>Katha-Guru-Charit, pp- 210, 211, 213. Beula Lakhindar, Published By-</td>
</tr>
<tr>
<td>36.</td>
<td>Ibid...... pp- 210, 211 &amp; 213. Beula Lakhindar, Published By-</td>
</tr>
<tr>
<td>39.</td>
<td>Vide, Asamiya Bhasa Aru Sanskriti,By-Dr.B.K.Barua, p- 134.</td>
</tr>
<tr>
<td>41.</td>
<td>An Account of Assam, By- Hamilton, p- 62.</td>
</tr>
<tr>
<td>42.</td>
<td>Vide, History of Civilisation of Assam, pp- 368, 364. Travels in</td>
</tr>
<tr>
<td></td>
<td>India, By- Travener, Calcutta, 1905, p - 455.</td>
</tr>
<tr>
<td>43.</td>
<td>Descriptive Account of Assam, By- Robinson, p-234.</td>
</tr>
<tr>
<td>44.</td>
<td>Ibid..... p-234.</td>
</tr>
<tr>
<td></td>
<td>Purani Silpa, p- 63.</td>
</tr>
<tr>
<td>47.</td>
<td>A History of Assam, By- E.Gait, 1926, p- 150.</td>
</tr>
<tr>
<td>48.</td>
<td>The Background of Assamese Culture,By-R.M.Nath, 1948,p-149.</td>
</tr>
</tbody>
</table>
50. Lachit Borphukan and His Times, By- Dr. Bhuyan, 1947, pp-150, 151.
56. Asamar Loka Sankranti, By- Dr. B.K. Barua, 1961, pp- 142-143, 210-213.
57. Asamar Purani Silpa, p- 64.
58. History of Civilisation of Assam, p- 376.
60. History of Civilisation of Assam, p- 378.
61. Ibid. p- 376.
62. Ibid. pp- 376.
63. An Account of Assam, By- Hamilton, p- 65.
69. A Descriptive Account of Assam, pp- 56-61.
75. Anglo-Assamese Relations, By- Dr. S.K. Bhuyan, 1949, p-55.
76. An Account of Assam, By- Hamilton, p- 46.
83. Assam Buranj (S.M), 1945, p- 5.
84. Asamar Loka Sankranti, p- 214.
85. Ibid. pp- 214.
86. Katha-Guru-Charit, p- 61.
87. A Descriptive Account of Assam, p- 28.
90. The Background of Assamese Culture, By-R.M. Nath, p- 73.
94. History of Civilisation of Assam, p- 378.
96. Purani Asamar Silpa, p- 34.
98. Purani Asamar Silpa, pp- 34-35.
100. Vide, History of Civilisation of Assam, p- 370.
101. Periplus, By- Scoff, p- 259.
103. Maniram Dewan, By- Sri B.Sarma, 1950, Vide, Appendix- p- 16.
104. A Descriptive Account of Assam, By- Robinson, pp- 35-36.
110. Ibid.... page- 2.
111. Ibid.... page- 2.
112. Ibid.... page- 8.
113. Ibid.... pages 7-8.
119. Yogini Tantra, pp- 2 310, 344.
121. A Descriptive Account of Assam, p- 35.
122. Purani Asamar Silpa, p- 17.
123. An Account of Assam, By- Hamilton, p- 46.
129. Purani Asamar Silpa, p- 17.
132. Purani Asamar Silpa, p- 17.
133. Ibid.... p- 17.
134. Asam Buranji, By- P.N.Gohain Barua, p- 40.
139. Ibid.... p- 19.
140. Ibid.... p- 19.
141. Vide, History of Civilisation of Assam, p- 373.
A Descriptive Account of Assam, pp- 34, 35.
An Account of Assam, By- Hamilton, p- 47.

143.. Vide, Maniram Dewan, Appendix, pp- 6-8. Buranji Vivekratna, By- Maniram Dewan.


149.. History of Civilisation of Assam, p- 373.


151.. An Account of Assam, By- Hamilton, p- 47.

152.. A Descriptive Account of Assam, pp- 33-34. Assam Buranji, By- Kasinath Tamuli Phukan, p- 20.


154.. A Descriptive Account of Assam, p- 34. Maniram Dewan, By- Sri B.Sarma, Appendix, page- 12.

155.. A History of Assam, By- E.Gait, 1926, p- 142.

156.. Purani Asamar Silpa, pp- 32-33.

157.. A History of Assam, By- E.Gait, 1926, p- 142.

158.. Purani Asamar Silpa, p- 35.

159.. A History of Assam, By- E.Gait, p- 148.
