

Technological Expertise As Practised At Aranmula*

Dr. Greeshmalatha.A.P
Associate Professor of History
S.N. College Chempazhanthy,
Thiruvananthapuram

Aranmulaⁱ is famous for its unique contributions in the field of metal casting and the construction of *chundan vallams* called *Palliyodams*. Quite as can be understood there exists the need for a great lot of technical expertise in the edifice of both. It also entails the assemblage, at one centre, of a variety of raw materials obtained from many places, often distant, this presupposes an extensive and efficient system of communication. The creation of these opus' necessitates the co-operation of large bodies of workers as well, each specialised in distinct craft, but all acting together in accordance with a common plan and under centralized directionsⁱⁱ. This involves a social organisation.

In the case of the construction of *chundan*, the co-operation of several workers are necessary at various stages like the selection of a suitable *annili* tree, felling it, hewing it out, dragging the results to the water, etc. Adze is essential for cutting the tree. Implements of special types are required for hewing the log. These implements can be made and provided by skilled labourers only. The wood cutters and sawyers cut the tree and shape it into a vessel. Some managerial power is more essential for combining the work as a

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whole. In short, the construction of *chundan*, involves a collective attempt and united effort of different social classes.

The present paper intends to discuss the technological expertise in the construction of *chundan vallam* called *palliyodams* and metal casting called *Aranmula kannadi*. It is a unique contribution of the area under study and the parallels of which are rarely found elsewhere.

Chundan vallam (Palliyodam)

*Chundan vallams*ⁱⁱⁱ are designated as *Palliyodams* when it began to associate itself with the temple activities. *Palliyodams* are Aranmula's unique snake boats, which devotees hold in reverence, considering it as the divine vessel of the presiding deity in Sree Parthasarathy temple.

Chundan vallam is a dug out extended plank-built vessel. It has a plank-built portion in the middle. Further it is extended on both sides with dug out pieces and after that the stem and stern portions are separately attached. The plank- built portion is made with 5 planks. The name, length, width, thickness, etc. of each plank is as follows:

| Name of plank | Length | Width | Thickness |
|---------------------------------------|---------|-----------|-----------|
| <i>Mathapalaka</i> | 45 feet | 20 or 22" | 4" |
| <i>Erapalaka/Achanpalaka/Keel</i> | 40 feet | „ | „ |
| <i>Vanku</i> or <i>Theeruvapalaka</i> | 48 feet | „ | „ |

Erapalaka is the keel, *Mathapalaka* are the two planks on either sides of keel and *Vanku* is the topmost plank. During the course of planking, workers first fix the *Mathapalaka* by keeping a stand. After that they attach the *Erapalaka*. Next they turn the vessel upside down such as to bring the keel underneath. Then they place the *Vanku* on *Mathapalaka*. These planks are being arranged such that they make a step like position on both the sides, enabling easier attachment of the dugout portion on it. Altogether, the vessel can have a length of 125 feet. Of that the plank- built portion occupies a length of 45 feet and the 2 dugout pieces which are attached to the plank-built maintain a length of 40 feet each. Towards the stem it becomes narrower and that portion is called *coompu* where they attach a specially made bronze mask. The stern of this *vallam* is made so high and attached to it by nailing. The height of *amaram* depends on the width of the vessel. In general, the height of the *amaram* is always measured around half of the total width of the *vallam*, i.e. a *chundan* of 51 *ankulam*^{iv} width having an *amaram* of 25½ *ankulam* height. Its *aniyam* has a height of 10 inch square.

The length, width, etc. of the *chundan* is as follows: a *chundan* of 100feet having 5 feet in the middle, 1½ feet width in the *amaram* and one feet width at the *aniyam*. It has a height of 3 feet in the middle, 15 feet at the *amaram* and 5 feet at the *aniyam*. It has a proportion called *vedithadi* having 5½ feet length and 5 feet width. Because *vedathi* was used for the keeping of weapons in early days, it got its name. But, at present it is earmarked for the

vanchipattu singers and drum beaters who inspire oarsmen. The oaring is synchronized to *thalam*. It is rather difficult to oar by mistaking the *thalam*. On both the sides and in the middle of the vessel, a lengthy plank is fixed. The two side planks called *Arikodi* are meant for seating the oarsmen while the middle row is called *Alodi* for the directors. In the past, the middle row was used for passing messages from one end of the vessel to the other. This vessel is having 55 steps, called *padi*. Each step has a width and thickness of 5 inch and the length varies according to the inner width of the vessel. The middle one is seen to be the largest and the length gradually decreases towards both the ends. Each step is fixed at a distance of 2 inch. The vessel has also ribs called *Manikal*. It is introduced to give strength to the vessel. A *chundan* of 125 feet has 45 ribs.

Paddles and oars are used to propel the vessel. Paddles are made out of *Annili* tree whereas oars are made from the Palm tree. Paddles are used in the *amaram* to control the direction of movement. They have a length of $7\frac{1}{2}$ feet. Of that, $3\frac{3}{4}$ feet is for its tongue and the rest for the handle. The width of its tongue is 10 inch and the thickness is $1\frac{3}{4}$ inch. There are oars of different sizes, the biggest one, to be used at the *amaram* having a length of 12 feet. Usually the lengthiest ones are used at the *amaram* and the *aniyam* while the length of the oar decreases to the middle. However, the length of the oar is noticed to vary from 12 to $2\frac{1}{2}$ feet.

Aranmula Kannadi

Aranmula kannadi is a unique example of bell metal casting. Instead of glass, it is made of a special metal alloy. The exact composition of metals used in the alloy is a family secret and completely unknown to the public, this knowledge being only passed on to the eldest member of the new generation of the family. These peculiar mirrors have not been reported to be found anywhere else in the world. As is evident, considerable metallurgical skill is required to forge such a mirror.

There are many traditions and legends regarding the origin of *Aranmula kannadi*. The origin of the *Aranmula* metal mirror is linked with the famous Parthasarathy temple of *Aranmula*^v. Scholars claim that five generations ago, the king of Pandalam brought eight families of bronze smiths from Sankaran Kovil near Tirunelveli^{vi} for the construction of the Parthasarathy Temple. Another legend says that a Travancore king brought two Vishwakarma families from Nagarkoil^{vii} for making materials like bangles, bells, vessels for cooking, and other such materials for required for rituals. These artisans then settled down at *Aranmula*. Their group consisted of people specialised in various crafts. But, their descendents became lazy and started being nuisance to the public. This forced the king to withdraw all the facilities which he had showered on the ancestors. Now these artisans could do nothing but take refuge before Lord Parthasarathy, the presiding deity of the *Aranmula* Temple. Legend says that the same night they had a vision about the composition of the

reflecting metal piece that gives distortion free images^{viii}. They then moulded a magnificent crown from the metal they had vision about, and presented it to the king. The pleased king, not just pardoned them, but also honoured them with land and jewels. This crown is called the *Kannadi Bhimbam* (mirror image). Since then, the artisans took up mirror making as their profession, presenting a masterpiece in metallurgy to the world.

Yet another legend goes like this. In ancient days, women used to wear ornaments made of bronze which was called *otta*^{ix} and had the function of an earring. One day a woman mixed lead with *otta* while making ornaments. She saw that this mixture gave reflection that was produced by a mirror. This alloy later came to known as Aranmula mirror metal^x.

Further, there is a story of an old crafts women and family who came from Tamil Nadu to Aranmula. This old lady, owing to ill health and old age, was incapable of performing her traditional duty and hence the family became impoverished. The women were not allowed to attend the temple duties. The lady and her father sought refuge at the Aranmula temple. The same night Lord appeared in her dream and showed her a special alloy and its preparation which could produce an image with the same clarity as that obtained from a glass mirror. This alloy later came to be known as the Aranmula Mirror metal^{xi}.

Still, another legend says that a Vishvakarma family from Tamil Nadu came to Aranmula to prepare an idol of Sreekrishna for the Parthasarathy temple. As they started the work of the idol using bronze, many ladies,

watching the work, put their ornaments made of silver and lead on the fire mould, out of respect to the Lord. After the work terminated, they saw reflections of their faces in the newly formed alloy. This led to the formation of a new alloy that came to be known as the Aranmula *Kannadi*^{xii}.

An alternate story is that a few centuries back, a priest of the Aranmula Parthasarathy Temple found that the crown of the deity was cracked. The Raja then summoned the head of the bronze smith community and ordered him for a crown to be made in three days time. The chief got all worried as he did not have the requirements handy and there was no time to get them from distant land. He came back home and told his wife of his worries. It is said that while in their sleep, goddess appeared in the wife's dream and told her the proportions for the bronze alloy that look like a mirror and asked her to tell all the ladies of the communities to surrender their gold ornaments. All the gold were collected and sold to buy sufficient tin and copper. The crown made of copper and tin turned out to be a marvel of art and craft. It was silver in colour, brittle like glass, shone with rare brilliance and when cleaned acquired the quality of reflection. The *makudam* of the crown called the *Kannadi Bhimbam* was preserved in the Aranmula temple till 1946. The casters soon worked out the ratios of the different metals used^{xiii}.

Some people believe that Krishnassari of Veluthedathu family near Aranmula rest house was the original manufacturer of the Aranmula mirror metal^{xiv}.

These legends explain the mythical origin of the craft. It is sure that the craft flourished under royal patronage in the vicissitude of Aranmula Parthasarathy temple. The legends and myths historicise some elements of truth like migration of craftsmen, significance of the temple divinity in the craft and royal patronage.

The chieftain of Aranmula liberally patronised the craft persons and even laid down an order that the mirror should form one of the eight auspicious articles used in all Hindu religious rites including marriages. Then they made a small *kunkuma cheppu* or vermilion container in bronze and filled it with a very small bronze mirror on the cover. This became very popular among the *malayali* society. Under the patronage of a few aristocratic ladies, the *vaalkannadi* flourished. But the demand died gradually as cheaper glass mirrors began to come up. The popularity of the handicraft grew by bounds just a decade ago, stepping up its demand especially in the foreign countries.

At present there are a just few families who practise the art of making of metal mirrors.

Copper, tin and lead are the chief materials used for the making of Aranmula Kannadi. Chemical analyses also show the presence of traces of zinc, iron, nickel, and phosphorus. The proportion of these metals are held secret and passed down only to new generations of the family. Manufacture of metal mirrors do not at all involve the use of any form of glass, but bell metal alloy instead. It is a mirror of mixed metals and its shining largely depend upon its

peculiar way of polishing^{xv}. It really sketches that craftsmen of the period were distinguished themselves by their work.

Knowledge of these types are noticed from different areas but much of it is extinct as the technology has not recorded anywhere. Usually such knowledge and practises are kept as a family secret by the craftsmen and passed on only to the elder member of the next generation. This is what happened in the case of the Mehrauli iron pillar at Delhi^{xvi}. The Mehrauli iron pillar manufactured in the fourth century A.D, which is a great tribute to the technological skill of the craftsmen, has not gathered any rust over the subsequent fifteen centuries. It is a pity that the later Indian craftsmen could not develop this knowledge further^{xvii}. We know of several bronze images of the Buddha, which began to be produced on a considerable scale because of the knowledge of advanced metal technology. The aim of this paper, in short is to bring such technology, practices and knowledge to light, preserve and record it.

Notes and References

- ⁱ A Village in the Kozhanjeri taluk of Pathanamthitta district, Kerala
- ⁱⁱ Gordon Childe, *Man Makes Himself*, New York, 1961 {1951} p.13
- ⁱⁱⁱ *Chundan vallams* are the naval crafts of medieval Kerala. It is vividly called as *Kothumbu vallam*, snake boat, *Palliyodam*, etc.
- ^{iv} *Ankulam* means finger, toe
- ^v Journal of Metallurgy, Indian Institute of Technology, Bombay, March, 1992, p.38
- ^{vi} Nattupatrika (weekly) Varthavarika, Thiruvalla, September (8-14) 2003
- ^{vii} Madyamam Sadvartha (daily) 12th June, Sunday, 1994. Also see Kerala Kaumudi Plus (daily), 2nd October, 1996
- ^{viii} Rashtradeepika (daily), 5th September 2001, Wednesday.
Also, Interview with the family members and local people of the region
- ^{ix} Deepika (daily), 19th April 1997 Saturday
- ^x Op.cit. 5th September 2001, Wednesday.
- ^{xi} Interview with a craft man at Arammula
Also see Sreedhara Menon.A, *Cultural Heritage of Kerala*, Madras, 1996, P.171
- ^{xii} Idem, *Kerala Samskaram* (Malayalam) 1982 P.162
- ^{xiii} Interview with the family members and local people of the region.
- ^{xiv} John Thomas, *Arammula Kannadi, Sathyavum Mithyum*, Arammula, 2002
- ^{xv} Procedure discussed in detail in the project report, Greeshmalatha.A.P, *Indigenous Craft, Art, Technology, Relative Customs and Tradition – A Case Study of Arammula*, UGC MRP, March 2009.
- ^{xvi} Sharma.R.S, *India's Ancient Past*, OUP 2009 (2005) P.248
- ^{xvii} Loc.cit.