Glass Bead Making Technology in Ancient Sri Lanka

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Abstract

Bead making and trading of beads are some of the oldest industries in the world. Beads are small, colourful, symmetrical, and often quite beautiful. They are frequently standardized, inexpensive units that can be arranged in almost endless configurations. They can be seen not only in familiar forms of necklaces and bracelets but also on anklets, headbands, and headdresses. Beads are small, but important finds from Archaeological investigations. Especially, the discovery of beads creates enormous interest among the excavator, researchers and laymen. It provides excellent information to the understanding of various aspects of the human past. While a couple of studies surmise of bead production no study has been confined to study the bead making industry in Ancient Sri Lanka. Therefore, the purpose of this study is to examine if there was a glass bead making technology in Ancient Sri Lanka. It is hoped to study the glass bead making technology of the past based on the archaeological data uncovered through archaeological research conducted in Sri Lanka. This study focuses on the traditional analysis method. Mantai, Kantarodai, Tissamaharama,Kirinda, Abhayagiriya, Ridiyagama Giribawa and Ridiyagama is one of the leading areas in the study of glass beads design technology in Sri Lanka

Keywords: *Beads making, Drawn, Glass Beads, Technology, Wound*

Introduction

Beads are small, colourful, symmetrical, and often quite beautiful. They are frequently standardized, inexpensive units that can be arranged in almost endless configurations. They can be seen not only in familiar forms of necklaces and bracelets but also on anklets, headbands, and headdresses. Beadwork is used in West Africa on altar mantles, garments for royal status, and coverings for kingly stools. In ancient Asia, beads were scattered like seeds beneath temples to induce bountiful harvests, and among the Kogi of Colombia, beads are part of ritual offerings to ensure the future of newly built houses (Jennifer, 2012, p5). In the Philippines, the practice of placing two beads in a cup at wedding ceremonies still binds marriages (Francis, 1990, p97-107).

Sri Lankan context, there is a dearth of historical accounts on ancient bead production, the origin of sources of raw materials, and the communities involved in the industry. Despite the lack of historical sources on beads thousands of beads are attested from excavations and explorations in Sri Lanka. A probe into literature revealed that previous research on beads found in Sri Lanka is very scarce. Sources of raw materials used to produce this array of beads have not been identified so far. While few studies have taken place on beads aimed at providing typological aspects, some describe trade links discovered by beads. A Handful of studies whilst investigating the beads found in the particular excavations suggest local bead production in Ancient Sri Lanka. For example, based on waste materials found in Gedige excavation Deraniygala (1972) implies there would have been local bead making in Ancient Sri Lanka. Coningham (2006) providing more concrete evidence based on Anuradhapura Salgahawatta British Sri Lankan Excavations hypothesized about bead-making at the site. Although not much attention is paid to Ancient Ruhuna until recent past an archaeological perspective, thousands of beads attested from the sites such as Ridiyagama, Akurugoda and Godawaya etc. indicate that beads have played a significant role in many aspects of the life of the community of Ancient Ruhuna. Therefore, more recent efforts can be seen in discussing the evidence on bead making in Ancient Ruhuna by scholars such as Bopearachchi (1995), Hannibal-Deraniyagala

(2001), and Somadeva (2006). The Tissamaharama Archaeological Research Area is one of the major trading centres in the Southern Province of Sri Lanka and a prominent place for a major beads manufacturing centre.

Materials & Methodology

Glass beads can be pointed out as the main materials of this research paper. In particular, the study will be conducted using bead samples found in recent research in the country. There is a traditional analysis presented through the study of morphology. The analysis was done on many factors like colour, shape, production technology, raw material etc. The traditional analysis focuses on the physical properties of beads. In particular, it is an important milestone in the study of samples of beads found in my research, and in the techniques used to produce the beads.

Glass Beads in Sri Lanka

Beads are small artefacts with a hole at their centre, made for stringing. They are of different shapes, sizes and materials, made of any materials that are solid and durable (Francis, 1982, p713-14.). Beads are very often overlooked due to their small nature. However, the importance of the beads is not laid with the size, colour or material made of but the people involved in them. Studies show that beads have contributed to many aspects of human life and shed light on the different roles of ancient human behaviour. There are several main types of beads found in Sri Lanka. Imported and manufactured beads will be very important. Glass beads and stone beads are the most popular beads found in Sri Lanka.

Glass Bead Production Francis (1991) suggests the production of small monochrome drawn beads (Indo-pacific beads) in Māntai upon the basis of a variety of wasters discovered in the site. According to Francis (1991) beads with longitudinal lines on the surface and round orange flat disc beads were made in Māntai. Considering the size of the hole of the latter, Francis assumes that these beads have been made by slicing a wide glass cane and perforation was made either by chipping or pecking (Francis, 2002, p10-5.). However, these beads are ubiquitous in all Sri Lankan sites and attested in great quantities, hence chemical composition analysis is required to determine the producers of these beads. In terms of glass bead production, no site has recorded an ample number of glass wasters in Ancient Ruhuna. The possibility of glass production is evident only in Giribawa so far. Glass beads discovered in Ancient Ruhuna, reveal three techniques followed to produce monochrome and polychrome glass beads. They are namely: Drawn wound and multi-technique. Drawn Beads Small drawn beads were known as Trade wind beads in the 1960s and later on they are known as Indo-Pacific Monochrome drawn glass beads or more popularly as Indo-pacific beads. Drawn beads are made in three major steps: glassmaking, tube making and the making of beads from the tubes (Francis, 1990, p1-23). Accordingly, the technique involves pulling a glass rod out of a gather of hot glass and cutting the rods into small segments.

More than 70% and 80% of the glass beads from Akurugoda and Ridiyagama constitute drawn beads of many colours. Upon the finding of 339 unrounded beads in Akurugoda, Hannibal-Deraniyagala, suggests re-heating segmented beads in clay pots. This is an indication of glass working on the site. Because, once the beads are segmented into the desired size, they are re-heated to round up the sharp edges. However, due to the absence of evidence, glassmaking in Akurugodaa was denied, Discovery of unrounded beads indicate the working of glass carried out in the site itself while glassmaking would have taken place in a remote area. It cannot be expected to discover evidence of glassmaking in major urban areas, as glassmakers dwell in remote places located distantly from settlements, to get access to resources required for making glass. However, the occurrence of coloured glass ingots, bangle like pieces that are from failed initial draws, and pieces of perforated and un-perforated tubes discovered in Ridiyagama cannot be disregarded. In addition, two small glass ingots were reported from Polibindivala and Kirinda port.

Fig.1.Glass ingots - Ridiyagama

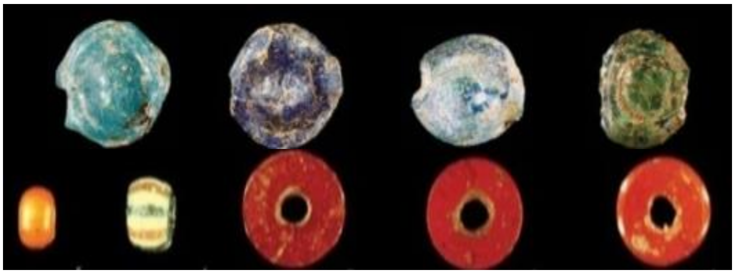

Fig.2.Glass Beads in Thissamaharama

Fig.3. Indo-Pacific Beads in Māntai

Glass Beads Technology

Silica (Si) in the form of quartz sand (SiO_2) is the most common metalloid used in glass. Glass is amorphous, without a crystalline structure (Francis. P; 1988:1989; p.1-21). Because the melting point of pure silica was too high for ancient furnaces to achieve, a flux, generally an alkali (usually soda [Na_2O] or potash [K_2O]) was (and still is) added to lower the melting point. Lime (CaO) or some other stabilizer must also be added. The ancients may not have known this; the lime was nearly always present as an impurity in the sand (Turner, 1956, p10-21). These ingredients are heated for several days, forming a dark, hard substance called "frit." Glassmakers break this up, add some scrap glass (cullet) and perhaps colourants, and then heat the mixture again. As if by magic, it melts and flows, and molten glass results. When glass is first made, it is translucent green because of the universal impurity of iron in both ferric and ferrous states. This colour is called "bottle green," because cheap bottles are made from this untreated glass. Many substances, chiefly metallic oxides, are added to impart various properties to glass. The most common additives are colourants. With only iron or copper and the proper handling of the furnace (blowing air into it, muffling it, or leaving it open) nearly every colour may be archived. Special colourants, notably cobalt (Co) and manganese (Mn), have been used since antiquity. Even tiny amounts of cobalt yield a pleasing dark blue. Manganese in small quantity produces pink, which cancels out "bottle green "and clarifies the glass, earning it the name "glassmaker's soap." Larger amounts produce violet. Antimony, tin, and arsenic were employed as opacifiers. Black glass is usually deep green or violet, made with large amounts of iron or manganese; an organic black glass also exists. Many colourants have been experimented with in recent centuries as the science of chemistry has developed (Weyl, 1959, p10-25). The most important other additives to glass are lead. Lead is a glass former, and glass with 90% lead has been recorded. Lead makes the glass softer, easier to melt and cut, and more brilliant, especially when used with potash. Lead also aids in dissolving other metals added to colour the glass.

Glass bead production needs to be studied with the other cultural material associated with it. The process of bead making involves division of labour and specialization on the various stages of manufacture; for a single artisan is not expected to work through all the stages of bead making, such as the procuring of the material, it is shaping, cutting, polishing, stringing and other stages in bead making. Thus, there is a need to understand and identify the stages of manufacture and its debitage at each stage of production. Accordingly, the above methods will be very important when studying the glass beads technology found in the Archaeology site in Sri Lanka.

Fig.4. A furnace wound bead is being built up – North India

Wound Technique

Glass is a "super-cooled liquid". The major ingredient in most glasses is silica, which needs a very high temperature to melt. It cools and hardens very fast. This leaves a very short period for the craftsmen to shape it. However, since ancient times, artists have found ways to exercise their creative will in designing/ shaping glass into beads. The furnace wound and moulding technique are regarded as the oldest, simplest and most common method of bead making (Francis, 1992; p15). The general features of the wound methods are seen in the twisted-rope like structure, transversely elongated air bubble, almost horizontal lines and sometimes the presence of more than one colour in the bead (Basa, 1993, p93-100).

Fig.5. Interiors of lamp wound beads – North India

Fig.6. Interiors of lamp wound beads – Mantai

A piece of melted glass is twisted around a metal rod to make wound beads. When the iron rod is cooled beads are removed. Wound beads are characterized by the appearance of different sizes of holes on each side. Glass is heated in a crucible in the furnace. An iron rod (mandrel) is dipped into the glass, and while being taken out, with a dexterous twist, the glass bead is built up. While still hot, it may be shaped with paddles and other tools or other glass may be added for decoration. Ethnographically, we find that beads are produced using this technique in many parts of the world. These are China (various places), Middle East (Hebron, Greece, Bida), Turkey, Egypt (Cairo), Uzbekistan, Afghanistan, India (Purdalpur), Pakistan (Hyderabad) and Nigeria (Francis, 1992, p15). In particular, this method has been used in the production of beads technology in Māntai Port, Sri Lanka.

Distinguishing the beads produced by these two techniques is not easy, as far as ancient material is concerned. However, the internal features in wound beads can provide important clues. A black film of iron oxide from the mandrel is often left behind when a bead is furnace-wound. A powdery deposit may be left when a bead is lamp-wound because the operation requires a separator on the wire to remove the finished bead. As per the difference between drawn and wound beads, in general, is concerned, the air-bubbles present in both is distinct and Sleen mentioned that when the bubbles are elongated or lying in lines parallel to the perforation, the beads must have been drawn; and when they were elongated perpendicularly to the perforation they must have been wound beads.

The beads are made with ductile glass wound upon a mandrel. The wound material is given shape by rolling it forwards and backwards on a smooth metallic surface (usually a piece of old well-worn railway girder) with the mandrel as an axis. The mandrel is a piece of round steel about a meter long with a conical end.

Fig.7. Shaping the wounds–North India

The former is an oblong piece of iron plate that is used to forge the bead into its final shape. The bead is shaped with frequent use of a form-iron and/or by rolling in a single or multi-channelled through. While still hot, it may be designed variously with paddles, form-irons and other tools. A wound bead can be re-inserted in the furnace when it is still hot and stripped or coated with another coloured glass with the help of a second mandrel. Two colours can be maintained in one crucible as glass in these crucibles is not allowed to become liquid. To make beads of some special pattern, shape or edged form, various open moulds or double spring moulds are used. Several such wound beads are built on a single mandrel (Alok, 2004, p123-50).

Fig.8. Use of form-iron – North India

Fig.9. some tools used by the bead makers

When the bead is finished, the mandrel is stroked hard with an iron tool called the mala so that the hole gets a little bigger and the bead is knocked off during the brief period when the iron cools and contracts faster than the glass and the hole is left when the mandrel is removed. The perforation circumference of the resultant bead will vary according to the tapering end of the mandrel. The bead is allowed to slide down into a small clay pot placed immediately below the working port which functions as an annealing pot. When the pot is full, it is covered with hot ash from the furnace and placed in sunlight and allowed to cool slowly. This is necessary to prevent stresses and cracks from appearing in the bead (Alok, 2004, p123-50).

Fig.10. Sliding down of beads into annealing pot – North India

Fig.11. Bead full pots covered with burnt ash – North India

Fig.12. Cracked beads lying scattered as debitage next to furnace – North India

Even when the bead or bangle is to be embellished with multi-coloured glass and other design material like gold and silver foil or different coloured glass powder, it is generally not re-melted unless a mixture is what it desired. This leads to the accumulation of such debitage in much more quantity and has the potential of altering the statistics of debitage of all varieties of bead production. No form of slip is used in making such wound glass beads. This is visible as a black layer of iron oxide on the inside of the hole in the beads. On an average 50gm in 1 kg of beads comes out as debitage at the furnace. Thus, it is evident that this wound method is widely used in the analysis of Māntai beads. In particular, 22% of the total Māntai assemble beads are manufactured using this wound method. Specifically, the wound Beads technology has produced an abundance of Māntai and Thissamaharama with extensive examples of this technology.

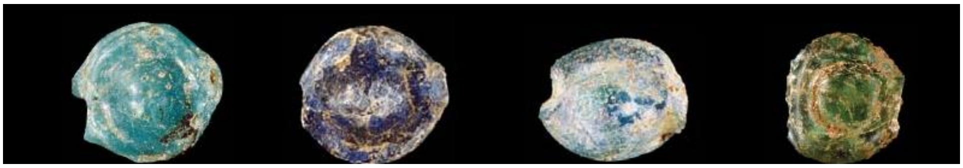

Fig.13. Wound bead – Thissamaharama

Fig.14. Wound bead – Mantai

Drawn Technique

The technique of drawing long tubes from a hot gather of glass was an important advance in the history of glass technology. Evidence of drawn glass tubes are lines parallel to the perforation (external striations) and elongated air bubbles in the same axis. Moreover, when the maximum diameters of many beads are similar and quite small, it is quite possible that the beads are manufactured by the drawn method.

In this method, glass beads are made from tubes of glass that have been pulled or drawn and subsequently cut into smaller segments. The earliest glass tubes are reported from the royal palace in Amarna, Egypt dated to about the 14th century B.C. Glass tubes could be made in different ways and for different purposes such as beads, bottle-necks and decorations. The simplest drawing technique is used in many glass industries in Firozabad (Alok, 2004, p123-50). In particular, this technology can be found in Māntai, Thissamaharama and Anuradhapura.

- Simple Drawing

In this process, the one guy puts one end of a pipe into the molten-glass pot in the furnace and winds a small quantity of glass on the end of the pipe. By blowing into the other end of the pipe a small amount of air, he converts the glass blob to a bubble on the pipe. Then the pipe is kept on an iron/wooden stand and an apprentice keeps on rolling it slowly, blowing into the pipe at intervals. Once the glass gets a little cool, then he again takes it into the furnace to wind additional glass onto this bubble. Taking it out of the furnace, he blows it once more and twirls it again on a wooden stand for about 5 minutes and then twirls it inside a basin which holds just enough water to submerge the glass bubble partially.

Fig.15. Maintaining the bulb - North India

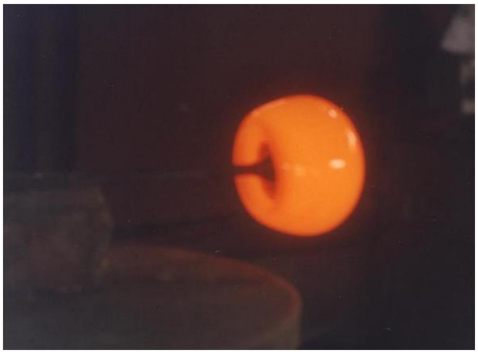

Fig.16. Rolling the hollow mass of glass on wooden stand –

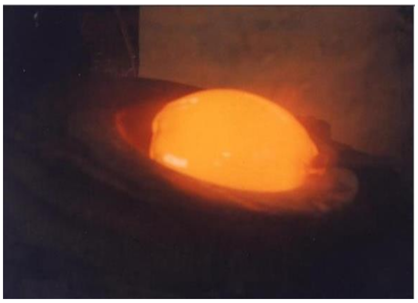

Fig.17. Cooling of the glass mass inside a water basin –

After about 5 minutes of this treatment, then he takes the pipe with the still malleable glass on it and shapes it by rolling on a stone platform. He then starts blowing it again and with the help of another person he attaches a second pipe to the mounted glass. They both then give a twist and start pulling apart the two pipes even as he continues to blow. This combination of blowing and pulling apart the glass results in a pipe the thickness of which is dependent on the coordinated manner of blowing and pulling apart by the two artisans involved. The floor of the working area is usually covered with a layer of straw to prevent any impurities and collapsing of glass. Once the glass pipes have been drawn, they are cut into the required size to be transported (Alok, 2004, p123-50).

Fig.18 Cooling of the glass mass inside a water basin – North India

Fig.19. Continuous blowing by the gaffer – North India

Fig.20. Pulling of the glass tube apart – North India

Fig.21. Characteristic curved glass bits

Fig.22 glass beads manufacturing fragments evidence in 1980-84 excavation

Then they can be cut again as per the end-users requirement. Its debitage is unique to the process. The ends of the drawn glass pipe result in thick, characteristically curved glass bits which are broken off and subsequently recycled. When pipes are removed from the rod in the end, the hardened glass residues comes out with an iron oxide impression on them. However, as far as beads are concerned they are produced in large quantity at Papanaidupet and with altogether different technology. They are commonly known as Indo-Pacific beads. According to investigations, this method has been used for the manufacture of Māntai beads as well.

This moulded method has also been found in the study of Tissamaharama, Ridiyagama, Māntai and Anuradhapura related beads. However, there are plenty of factors in India when it comes to the technology of these beads. Wound beads can be pressed or spun in a half-mould to give them a special shape, but true moulding of beads was a development of the Bohemians (or Czechs) in northern Czechoslovakia (Francis, 1990, p1–23). The original moulds were hand-held tong affairs into which a bit of hot glass from a cane was placed. In ancient Indian moulded glass beads, usually a very thin rim is seen. This is caused by two reasons. On joining the mould, the flow of excess glass creates a thin circumference around the piece or the rim which is caused by differences created by differential cooling of the glass in the upper and lower faces of the mould. After winding the glass and when it is still hot on the rod, the press tongue mould is used for giving various shapes and for designing figures. A moulded bead was created by flowing molten glass into a mould, which often had channels for the insertion of a combustible core. These cores burned away, forming a perforation in the bead. With a technique called "dry moulding", the moulds were filled with lumps of cold glass which, upon extended heating, melted and conformed to the mould.

Also, the use of a furnace is another important aspect in the study of these beads technology. In particular, the use of these furnaces can be cited as a major factor in the production of beads. However, although the physiological evidence of the stove technique used in the manufacture of beads is not definitively known, some evidence has been found. However, there are still factors in India when it comes to the use of furnaces used in the manufacture of beads. Accordingly, the use of the furnace used in the manufacture of beads is an important milestone. There are many factors in India when it comes to this furnace technology.

For example, At Purdalpur, one sees a profusion of furnaces right from the entrance to the village. In contrast to the general opinion that glasswork areas are placed on the outskirts of habitation areas as they generate enormous heat, at Purdalpur, they are occasionally located inside the habitation area. However, in most cases, they are a little away from the habitation area. At present there exist about two hundred furnaces at which the beadmakers produce various forms of glass beads, bangles and many other small objects like Mahadev (Shiv-linga). All the Beadmakers are males and the great majority of them are Muslims. There are normally fourteen to twenty beadmakers working in each of the glassworks. Each furnace house has one furnace inside and a small clay and brick locker in one corner for safekeeping of tools and glass cakes (Alok, 2004, p123-50).

Almost all the furnaces have a thatched roof, which is very high in the centre and has low margins at the two sides supported on six to eight brick/ wooden pillars. The bigger tools like drawing iron, arm-ring cone, mandrel, grabbing iron, stirring iron, glass maker's pipe, etc. are left inside this open house after the day's work without any fear of theft. At the furnace, each glass worker has his place of work, where he sits on the ground or a sack while he works. Many of the workers have achieved mastery over a variety of differently designed beads while a few specialize only in making particular types of beads, bracelets and bangles.

The bead makers construct their furnaces. This job is led by one of the experienced beadmakers and takes about a week. However, certain young professionals in the village have mastered the art of furnace makes. Many rectangular, sun-dried clay plates are placed standing upright around the pit that is to serve as the base of the fire chamber. These plates separate the individual workstations. The number of plates shows how many beadmakers can work around the finished furnace. The circumference of the furnace is bounded by a line of clay bricks at ground level. A clay dome is made either by directly building over the clay plates, or separately built in an inverted stone/ cement basin (in which the animals are fed), and placed laterally over the standing clay plates. In any case, the top is left open and is covered with a clay plate only when the furnace is in use. This opening facilitates a regular change of crucibles (Alok, 2004, p123-50). The furnace is built of coarsely tempered clay mixed with chopped straw. This practice of adding finely chopped straw to strengthen the "poor", "lean" or sandy clay has been an ancient technique (Singh, 1989, p187.). When the furnace is fired, the straw burns off, leaving a highly porous clay furnace that can cope with the great range of temperatures between the day's high working temperature and the night's cooling off. Outside every furnace house, clay is stored in a pit and every day one of the workers tramples on it while pouring water. Four Y-shaped wooden poles are placed close to the furnace in a square layout to dry the wood over it for the next day's fuel.

The furnace is made in such a way that the various types and forms of beads, bangles and other minor objects can be made at each workstation. The opening from which the glass is picked up is called the window, and just inside it, there is a small open crucible for the glass, measuring about 25 by 40 cm and made of clay mixed with chopped straw. The windows are uniquely designed for various products like beads, bangles and other objects. It is also necessary to change the crucibles continually because a crucible will normally be burnt out after about two weeks. When crucibles are replaced or the structure is repaired, the outside of the old furnace is built on with new, straw-tempered clay. The logical construction of the furnace is derived from the experience of generations, transmitted from father to son over hundreds of years. With this type of furnace, one can produce temperatures that are high enough for the making of glass beads and armourings with the least possible consumption of fuel. In normal circumstances the furnace can be used for about half a year, depending entirely on how carefully it was built and maintained. Thus one sees continuous reconstruction of furnaces in the village and they are generally made at the same place after demolishing the earlier ones (Alok, 2004, p123-50). These results in an abundance of fired clay fragments with glass spilling, clay pots, clay plates, arm-rings, broken crucibles with a glass layer and bricks and other debitage littered around the glass-works.

One can see the piling-up of such debitage around after hundreds of years of breaking and making anew of furnaces. Once fired and broken, clay cannot be reused for furnace activities. When work is going on in the furnace, it is fired exclusively with dry deciduous brushwood. These quick-burning branches produce a lot of flames and thus higher temperatures, while the production of large quantities of charcoal is avoided. Dried branches are preferred to real logs because with these one can better control the firing of the furnace.

Work in the glassworks begins early in the morning at around 4 o'clock, with the stroker lightning the furnace with logs of wood and cow-dung cakes. It takes about an hour and a half for the furnace to reach the right temperature for the day's work to begin. An iron pipe is used to blow the air into the fire. The crucibles are filled with broken glass either broken from new cakes or collected. It takes about half an hour for the glass to melt sufficiently for beads and armoring's to be made. Very often new cold glass is added at the back of the crucible while work is going on from the front. When this has melted, the beadmaker mixes them well and pulls them to the front of the crucible with a stirring iron (Alok, 2004, p123-50). There is no age restriction for the beadmakers; they are of a mixed age group ranging from seven years to any age upwards. Generally one of them keeps on singing movie songs mixed with various risqué expressions. Such bawdy singing is not merely entertaining optionality but is considered imperative for a productive and enjoyable working session. The prevailing mood at such sessions being what it is, any query put to a worker at that time brings forth a risqué double entente as a response. Once the pots cool down the beads are taken out for temporary cleaning and sorting and the debitage consisting of cracked beads and closed perforation is thrown nearby. This is the job for children and elders alike.

Summary

Archaeology site in Sri Lanka has been explored and excavated many times until now, and a number of beads, raw material, and fragments were found here. The manufacturing process and the technology of the beads are important milestones in the study of beads. Among the glass beads found in Sri Lanka, some of the main types of beads were identified. They are Indo- pacific beads, segmented beads, Collar beads, and striped beads. Most of the glass beads found in Sri Lanka are Indo- pacific beads. They were made in a limited range of colours, with various hues: opaque reddish-brown, orange, yellow, green, red and black; semi-translucent greens and blues; and translucent amber and violet.

The making of beads requires specialized skills, equipment and tools. It is a noticeable fact that the methods of the manufacturing of beads had reached a highly developed stage in the beads found in Ancient Sri Lanka. Raw materials and skills for bead production must have arrived on Southern coasts through these commercial links. Therefore, the diffusion of knowledge, skills as well as manpower required for bead production must have been transmitted rapidly as a result of trading and seafaring activities during the time.

Accordingly, this was studied the glass bead Making technology of the past based on the archaeological data uncovered through archaeological research conducted in Sri Lanka. Mantai, Kantarodai, Tissamaharama, Kirinda, Abhayagiriya, Ridiyagama is

one of the leading areas in the study of glass beads design technology in Sri Lanka. In Sri Lanka, the study of beads is primarily based on their typology, technology and the provenance of the materials used. Hannibal Deraniyagala has mainly concentrated on the typological and technological classifications and provenance of the beads discovered at Tissamaharama, an early regional capital in Southern Sri Lanka. Scientific analysis of these beads has been carried out by Schüssler et al and Rösch et al. who have focussed on determining the provenance of materials by comparing beads from Tissamaharama, Akurugoda and Anuradhapura with those from Thailand and Oman. Francis is the other leading researcher of Sri Lankan beads, particularly those from Mantai. His main focus is bead production technology and he provides evidence for Mantai being a production site, particularly for Indo-Pacific beads during the Early Historic Period. A common theme revealed by this research is Sri Lanka's foreign trade links. However, this research has studied glass beads technology in Sri Lanka. This study focuses on the traditional analysis method. Mantai, Kantarodai, Tissamaharama, Kirinda, Abhayagiriya, Ridiyagama Giribawa and Ridiyagama is one of the leading areas in the study of glass beads design technology in Sri Lanka. The study of ancient glass bead production technology in Sri Lanka, South India and North India can be mentioned as areas where this technology is still active today. Especially, a comprehensive analysis of the bead technology in ancient Sri Lanka can be obtained by comparing it with the facts present in India. Accordingly, these factors were very important in the study of ancient Sri Lankan Beads technology.

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