SOME PRELIMINARY REMARKS ON THE IDENTIFICATION *OF* BEADS

BY PETER FRANCIS JR

"The writer of a report which contains beads must recognize the responsibility inherent in publishing them. A mere slip of the pen or simple misunderstanding can lead to considerable confusion."

Beads make for compelling study to many people. Beads are a universal expression of an ancient human need to beautify. They are often products of evolving technologies at the forefront of more sophisticated development of new materials and extractive or manipulative processes. They are often made of durable materials, which means that they survive into the present from much earlier times. Since the trade in beads extends far back in time, they mark the interactions between communities and the commerce in goods and ideas. Beads are vital archaeological, historical and ethnographic resources.

Once the relevance of beads is acknowledged, their study becomes a useful adjunct to research into the human condition, past and present. As with any artifact, such a study cannot be conducted properly unless all involved can speak of the object in question with some degree of precision.

For far too long, reports on beads have included such phrases as, "they are round, tubular, and keg-shaped, made of glass, stone, and shell, and are brown, red, green, and white in color". Such descriptions are as uninformed as they are uninformative. If one takes the time to deal with beads, one must also expend the

effort to deal with them scientifically and to describe them properly.

The writer of a report which contains beads must recognize the responsibility inherent in publishing them. A mere slip of the pen or simple misunderstanding can lead to considerable confusion. A recent example in this region is the reporting in English of a bead assemblage in which the beads were said to be "wound". To her credit, the author realized her mistake and corrected it, although in a paper published in another language. In the meantime, an important paper was published by another writer who had seen only the original report and drew conclusions on that basis. His conclusions, needless to say, were thereby jeopardized.

The ability to describe beads is by no means the ultimate goal of bead research. Indeed, it is merely the initial, mechanical step required for serious study into this subject. Although not the final objective, accurate and complete description of beads is absolutely necessary before any further work can proceed.

THE MATERIALS OF BEADS

BEADS CAN BE AND HAVE been made of virtually any solid substance. The material from which a bead is made is of fundamental importance. Its identification can greatly aid in determining the age or origin of a given bead. In the case of synthetic materials, particularly glass, the constituents of the substance and the way in which it was manipulated are crucial in the process of identification.

Both the bead researcher and the less specialized scholar dealing with beads must become acquainted with a broad range of materials. The recording of materials must be as specific as possible. In the case of biological substances, the botanical or zoological taxa must be included.

For stones, the proper mineralogical or petrographic name needs to be specified. If the researcher does not personally have the expertise to make such identifications, the help of a specialist must be sought.

NATURAL ORGANIC MATERIALS

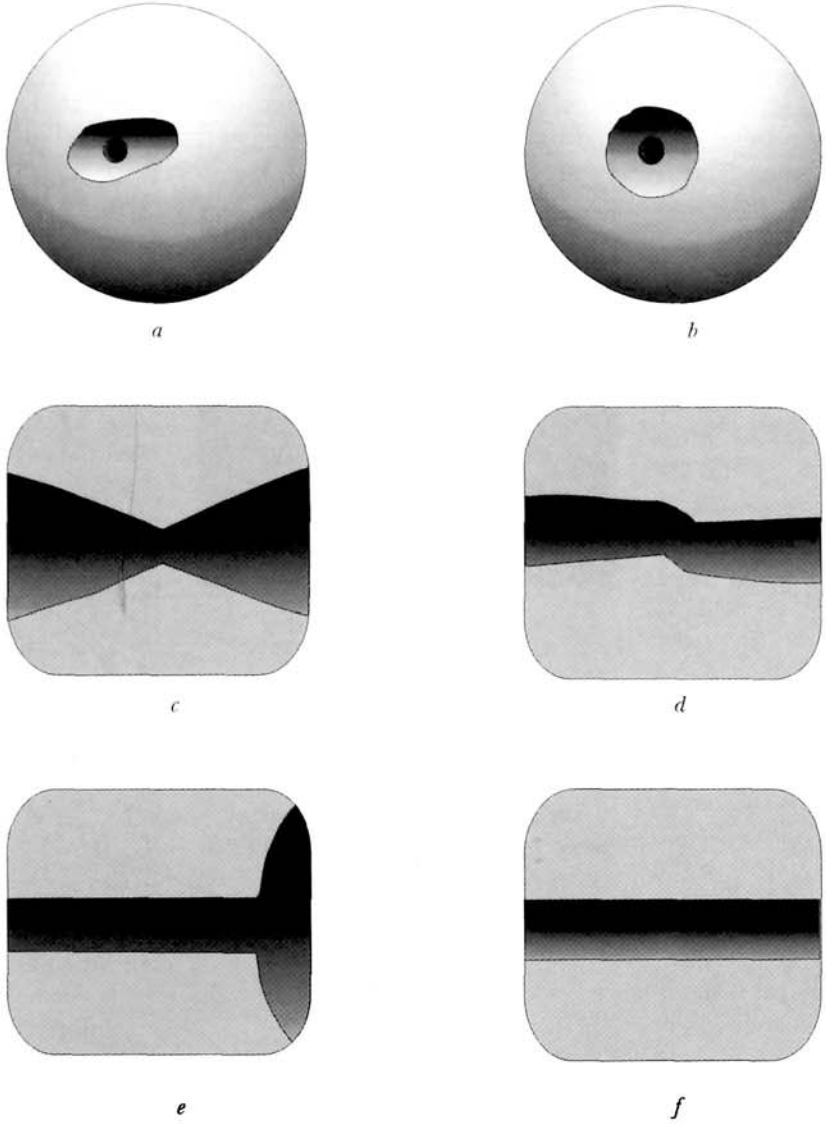
MOST ORGANIC MATERIALS are perishable and do not survive into the archaeological record. Plant and certain animal products were likely the most common ornaments in prehistoric times and are still widely used for adornment today. A thorough familiarity with local native species of the plant and animal kingdoms will aid in the recognition of exotic products.

The most widespread organic material used for beads are mollusc shells. They can be employed in two ways: 1) by taking advantage of the color and shape of the whole shell; 2) by cutting large shells into smaller beads. When whole shells are used, they must be identified and it should be noted how they were perforated, whether gouged, ground, or hammered, or more rarely sawn or scratched, or a combination of these actions (Francis 1989a). The placement of the hole in the shell also furnishes data about how the shell functioned as an ornament.

Large shells can be broken up and made into beads. Flat shells, usually bivalves (but also large univalves and other flat materials), are often made into disc beads by being broken into circlets, drilled individually, strung together and ground on a stone to smooth them and make them the same size. This "heishi technique" is tens of thousands of years old and common throughout the world. Its presence, marked by the similarity in the diameters of large numbers of disc beads, should always be investigated and noted (Francis 1989a).

Very large round beads of shell can only be made from the columella (central supporting column) of large univalves, such as certain conches. They reveal their origin by a visible spiral structure. All cut shell beads can be distinguished from other beads of similar white materials by their three growth layers, resulting in two parallel layers separated by a third oriented diagonally or perpendicularly to the others. Several other animal parts have been used for beads, many of them for tens of millennia. Among the most important are teeth (including ivory), and bone. The identification of the source of teeth may shed light on the cultural meaning of beads. For example, those of carnivores demonstrate the strength of the procurer and probably served as talismans to bring the power of the wild animal to the wearer, while teeth of herbivores indicate prowess in hunting. Bones are often so altered that their orgins cannot be identified, but usually a distinction can be made between the bones of

FIGURE 1: STONE BEADS



birds, mammals, and fish.

Though much rarer in the archaeological record, the ethnographic evidence strongly suggests that plants were very important in prehistoric times, as they are to many people today, for beads and other ornaments. Indeed, plants may have vastly outnumbered ornaments of other materials (Francis 1984). They survive for very long only in unusual circumstances, such as in a very dry or a waterlogged situation. However, there is little doubt that plant materials such as the fruit of "Job's tears" (*Coix lacrymajobi*) were long used to beautify the body and other objects.

NATURAL INORGANIC MATERIALS

STONES, MORE PROPERLY, rocks and minerals, have been widely used for beads, particularly since the introduction of metal tools. By far the most common bead mineral is quartz, either crystalline (rock crystal, amethyst, citrine), fibrous microcrystalline (the chalcedonies: agate, carnelian, onyx), or granular microcrystalline (jasper, flint). Quartz minerals are often color-altered by man. Carnelian is almost always heated to bring out its red color. Onyx is invariably man-induced by soaking banded agate in a sugar solution then heating it (for brown onyx) or putting it into sulfuric acid (for black onyx), (Plate 1). Golden citrine is made by heating poor quality amethyst in a complex process.

Other minerals, notably feldspar, apatite, garnet, serpentine, nephrite and jadeite, and certain rocks, especially lapis lazuli, granite and diorite, and limestone are widely used for beads. Steatite ("soapstone") has been heavily exploited. A massive form of talc, it can be scratched with the fingernail and is thus easily carved. But when heated, the water of crystallization is expelled and the stone becomes quite hard and, though dull and opaque, is most suitable for beads, amulets, and small objects.

Plate 1. Semi-finished agate beadmaking waste from Limudra, Gujarat, west India. The grey banded stone is "Babaghoria" agate, commonly altered to onyx. The flat, rounded pieces are of chalcedony: black ("Lydian stone) red (carnelian); and white. They are center blanks from cutting stone rings. (Largest chip 3cm long).

In the case of stone beads, the methods of manufacture should be noted as far as it is possible to discern them. Raw stone is usually chipped into shape, and then ground into a final form. It is then either perforated and polished or vice versa. Polishing is usually done either by abrasion, which leaves tiny striae on the bead and ensures very sharp edges on faceted forms (Plate 2), or by tumbling, which gives a more even polish and rounds the edges of faceted forms.

Before the use of diamond drills, large, usually conical holes resulted from the coarser width of stone drill bits (Fig. 1c). If the holes are badly off centre ("wobbly"), the use of a hand-held (Fig. 1a), as opposed to a mechanical drill (Fig. 1b), is indicated. Diamonds have been used for drilling stones in South and Southeast Asia for more than 2,300 years. The holes of diamond drills are usually fairly straight and thin. Nearly all hard stones are drilled from both ends (Fig. 1d) to prevent the far end from chipping as the drill emerges (Fig. 1e). A joint in the perforation can be detected either with the eye or by lightly running a pin through the hole (Fig.1d, 1f).

Unfortunately, the techniques for making stone beads and the shapes in which they are formed tend to change very slowly over time. This means that there is not as great a variability among these beads as compared to glass, and the sourcing of stone beads and dating of them out of context are relatively difficult. At this stage of our knowledge, the

bulk of semiprecious stone beads (particularly of the quartz group) seem to have come into Southeast Asia ultimately from India, either from the large but relatively short lived lapidary of Arikamedu or the venerable industry of Gujarat in western India. It is of great importance to identify other stone bead-making sites in the region. Several have now been found, and more identifications will help refine our understanding of this industry and the trade in its finished products. To confirm an industrial site, waste products and unfinished beads need to be found. (Plate 3). Then it is possible to reconstruct the method by which the stone beads were being made.

Metals, whether in their native state, smelted, or alloyed, have been used for beads for millennia. All metals known to the ancients, with the exception of tin, are first recorded as having been used for beads or pendants. Metallurgical studies are rather advanced and can be called into service to discern the type of metal — and sometimes its source — of a given bead. The ability to melt and re-use metals and the intrinsic value of certain metals limits their occurrence in many bead assemblages.

GLASS BEADS

GLASS IS A SYNTHETIC, AND like clay and faience a ceramic product. Clay, though long used by humans, has a surprisingly restricted use as a bead material. Faience was never made in Southeast Asia, and though a few beads from the Islamic West were imported to a limited number of sites, it is rather rare. Hence, neither of these materials will be dealt with at length here.

On the other hand, glass has for the past several millennia been the most popular material for beads due to its relative economy, its durability, and its great variety. Distinguishing glass from other materials is not difficult, as glass must be manipulated (though on rare occasions, glass pieces are drilled as beads in the manner of stones), and the results of this manipulation can be recognized.

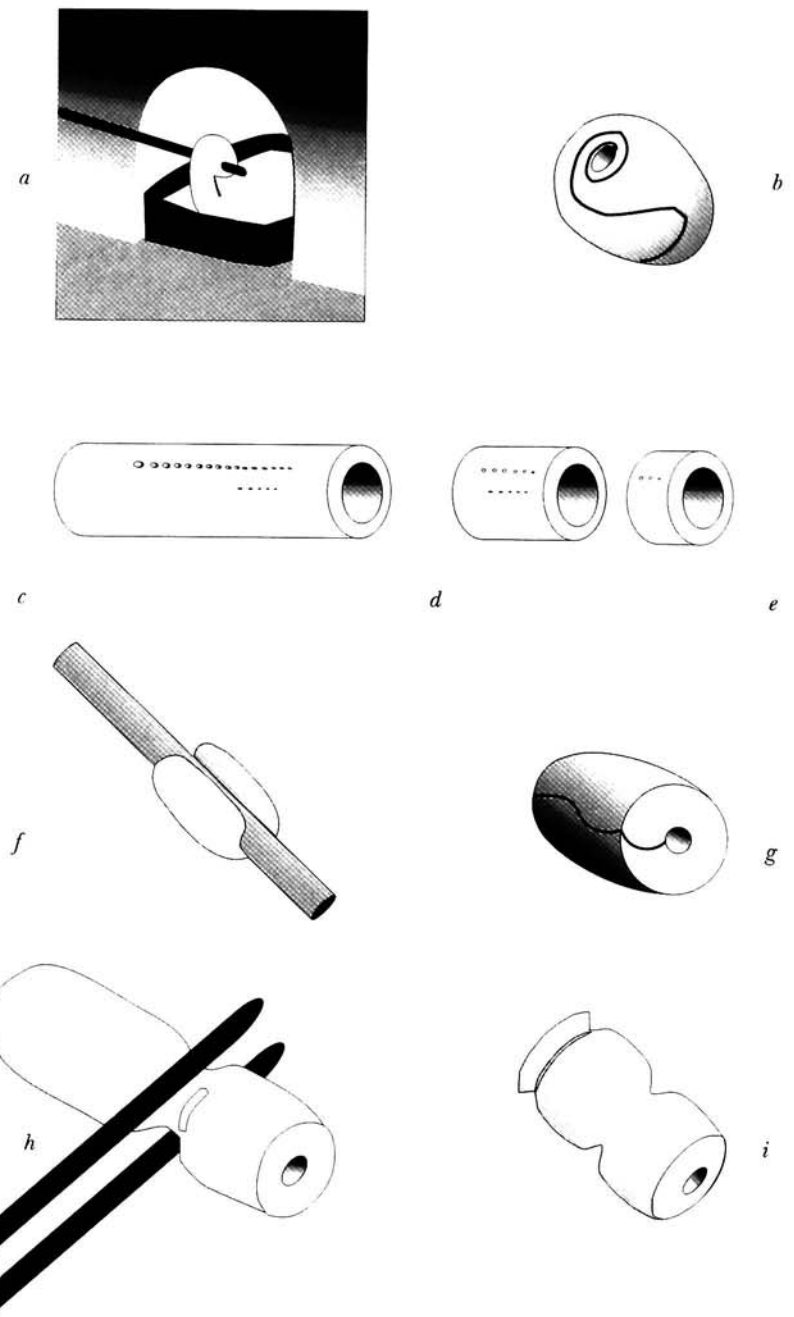
Plate 2. Bead polishing stone with several grooves for the beads. From Kotalingala, Andhra Pradesh, India ca. 5th to 2nd century B.C.

There are many ways to form glass into beads. The most common is by winding a stream of hot glass around a rod or mandrel, (Plate 4). This will leave the fabric of the glass and any inclusions (especially air bubbles) oriented around the perforation, (Plate 5). Bubbles will also usually remain spherical in shape. This process is known as "winding", and may be effected by any of several means. It was virtually the only glass bead-making method used in China and northern India, and a major method used in the Middle East and Europe (Figs. 2a, 2b).

Another very important glass working process in Southeast Asia is done by drawing the glass into a tube, cutting it into sections, and heating the cut sections to smooth off the resulting sharp edges. These beads are distinguished by having their fabric and inclusions aligned in the direction of the perforation. "Drawn" beads, as they are called, were the dominant bead in Southeast Asia from the last few centuries B.C. to ca A.D. 1200, having been made in India, Sri Lanka, Sumatra, Thailand, Malaysia, Vietnam, and perhaps elsewhere in the region. These small, monochrome drawn beads are known as "Indo-Pacific beads" because of their wide distribution, (Plate 6).

The process of drawing beads is not limited to this region. Drawn beads of several types have long

FIGURE 2: GLASS BEADS



formed the backbone of the European glass bead industry, the small ones commonly being employed in beadwork (Fig. 2c-2e).

What distinguishes the Indo-Pacific bead industry from other industries which made drawn beads is the unique way in which the tube is formed. This complex process, known as the "lada" technique after a key tool used in the work, is the hallmark of this industry. It is not possible to say whether a certain bead was made by this technique simply by examining finished specimens. What is necessary is the finding of a bead-making site with its attendant specific glass waste. A number of such sites are known in the area, and the identification of others will help us expand our understanding of this key past industry (Francis 1990a).

Among the other methods for making glass beads, two of especial importance to Southeast Asia can be noted. One is the manipulating of a ribbon or plaque of glass by heating it and folding it around a wire or by joining two or more around a wire. Such "folded beads" are mostly the product of the early Islamic West (Figs. 2f, 2g), although also employed at Sririjaya (Palembang, Sumatra).

Another is a technique by which glass tubes are heated and constricted along their length to form bulges which are then cut apart for beads. Thin tubes, often with several beads left in succession, are known as "segmented beads", and are mostly from the Islamic West (Figs. 2h, 2i), (Plate 7). Thick tubes, constricted so that single beads are detached, are called "pinched beads", and are one of several by-products of the Indo-Pacific bead making industry.

THE FORM AND DESIGNATION OF BEADS

THE CLASSIC WORK ON THE description of beads is by the pioneer of bead studies, H.C. Beck (1873-1941). Although his classification (Beck 1928) scheme has rarely been followed, his nomenclature has been widely adopted. As a result, there are standard terms which have been in use to describe beads for many decades. These terms have been developed through the customary scientific method of assigning priority to the first description of beads. They have been collated and are easily available (Francis 1989 b). To deviate from the accepted usage of terms is not only annoying, but risks having a particular work on beads being misunderstood or ignored (Fig.3).

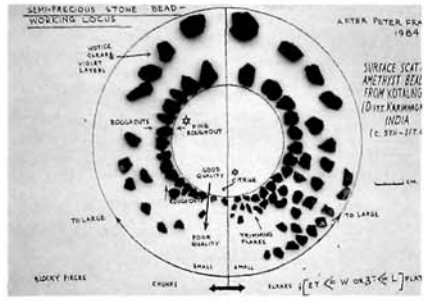
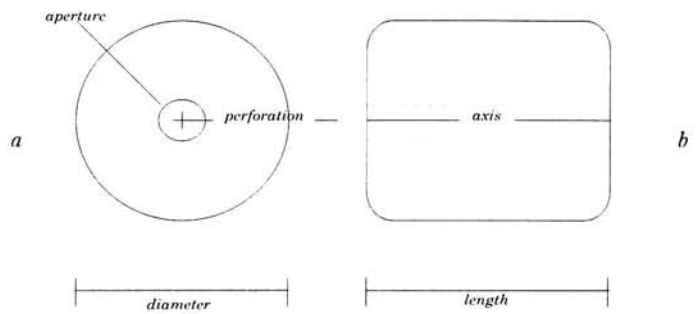


Plate 3. Distribution diagram of surface collected waste of amethyst from Kotalingala. By separating the pieces by size, shape (flake or chunk), and quality it is possible to see at a glance what work was being done at a particular locale. This beadmaker was using pre-refined stones to chip out roughout (crude bead blanks).

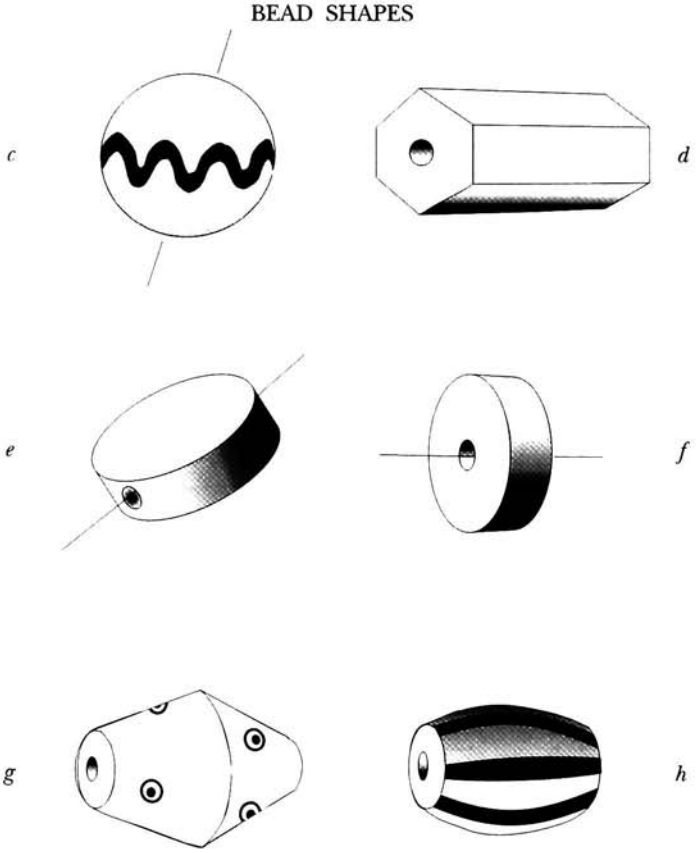
Many beads can be described simply by noting their geometric shape. Terms such as "sphere" and "oblate", "cylinder", and "cube", "barrel" and "bicone" are standard words whose dictionary definitions will usually suffice for understanding. In general, the cross section of a bead precedes the profile in describing it, but there remains room for choosing alternatives. A "hexagonal prism", "hexagonal tube", and "hexagonal cylinder" will be recognized as being the same thing. The term "disc" is reserved for beads which are much shorter (end to end) than wider. One special term used is "tabular", which refers to a disc-like bead which is perforated from edge to edge (Figs. 3c-3h).

There is a growing consensus that bead classification needs to be rationalized. A classification system is currently being developed as a joint effort by the Bead Roundtable, consisting of a group of volunteers

FIGURE 3:
SOME BEAD TERMS



SOME COMMON
BEAD SHAPES



among bead researchers (Francis 1990 b). The further systemization of bead nomenclature will also follow.

Finally, it should be stressed that care and common sense prevail in the subject of bead nomenclature. A glaring example in Southeast Asia is the recent use of the term "capped bead". I have discussed this term with several people, and discovered that it has arisen from a misinterpretation of a drawing in van der Sleen (1975) in which a round capped bead is shown. The bead on the plate, however, is called a "capped bead" because the ends are "capped" with small hemispherical metal "caps". However, the simple drawing was erroneously taken to be the depiction of an ordinary round bead, and several recent reports in the region have referred to "capped" beads when "round", "globular", or "oblate" beads are meant. Though we can see how the mistake arose, simple common sense or a glance at a dictionary would have shown that the term "capped" is in no way a synonym for "round", and cannot be substituted for it.

There will be instances in which the researcher needs to describe and name a new bead type. How should this be done? A growing consensus stresses a hierarchy of nomenclature for beads. Priority is assigned the name of a bead given to it by the bead maker. If a bead is especially important to some group of people who have given it a name, this is an acceptable designation for it. In the absence of such data, a name which is satisfactorily descriptive or derived from the type site is acceptable. Terms used especially for older beads by antiquity dealers or collectors have the weakest claim to being appropriate for a hitherto unclassified bead, as such names are far too commonly coined to give the bead a certain false cachet and have often been found to be unsatisfactory.

Plate 4. Winding a glass bead by inserting an iron mandrel into the hot glass in the furnace (furnace-winding). A few twists of the rod allow the glass to form into a bead shape which can be changed further by manipulation. This small glassworks is in Cairo, Egypt.

BEADS AND BEAD COLLECTING

ALTHOUGH A SLIGHT digression, this may be the convenient juncture to discuss the value of unscientifically formed bead collections. The collecting of beads has become more popular around the world in the last few years. In most of Southeast Asia, many collectors are willing to pay large sums of money for unusual beads, and they have their counterparts in North America, Europe, and Japan, (Plate 6).

Few serious students of the past will disagree that this can cause severe problems for archaeology. In Indonesia and the Philippines, and especially in Thailand, organized gangs of looters routinely destroy archaeological sites in search of the objects which they contain so as to sell them in the antiquities market. Increasingly, beads are a focus of such activity. There is little disagreement that this is to be deplored.

But a problem for the researcher arises: what use, if any, can be made of such collections? Unfortunately, in some situations, there is little else to do but to study them. One famous site, quite possibly dating to the first half of the first millennium is a source for beads. The religious official whose establishment has control of the site has for many years collected materials from there, and this collection is invaluable in studying the bead industry which once flourished there. Compounding the problem, however, is that he also buys antiquities from other sites elsewhere and adds them to his collection, thus greatly confusing the

picture. There is little else to do but to study his collection, but the researcher must be aware of its many limitations.

Private bead collections have the advantage of giving us an idea of the range of beads available in a given region or country. The disadvantages are clear, however, and any use made of such collections should be circumspect and should in no way encourage the further purchase of beads or other ancient objects on the antiquities market.

THE COLOR OF BEADS

THE COLOR OF MANY natural materials is often well established, though when there are variations (as is common with rocks and minerals), these must be reported. For the most part, the question of color is especially important with glass, as color alone can offer clues to the nature of the glass or specific ingredients used in it. Along with the hue, the degree of opacity also needs to be recorded.

For glass, western researchers are increasingly relying on the use of the (U.S.) National Bureau of Standards ISCC-NBS Centroid Color Charts because of their availability, acceptance, and low cost. They distinguish 267 colors. Finer distinctions between shades are hardly necessary when describing ancient glass, as the color of such glass was always highly variable even on a daily manufacturing basis.

Researchers who do not have access to this set are advised to use the Munsell color cards (which are far more expensive). If no charts are available, the best thing for a researcher to do is simply to describe colors as clearly as possible. It is highly inadvisable to use some obscure series of color chips, such as might be available from a local paint supplier or printer. In one case, such a system employed for an otherwise widely used classification scheme, caused considerable confusion in North America. It is also strongly discouraged to make arbitrary designations or new names for colors of given beads, as has recently been published in a paper on some ancient Thai beads. It is far better to describe a bead as "dark translucent blue" or "opaque reddish brown" than to coin imaginative terms for these colors or to use a color coding system available to no one else.

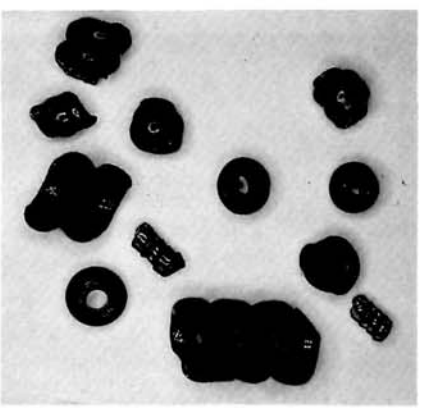


Plate 5. Examples of one sort of wound bead in which the twisted nature of the glass fabric is easily seen. These are heirloom beads among the Akha of northern Thailand. They were made in China down to the 17th century or so. We call them "coil beads." (Largest bead 2.5 cm long).

The colors of glass result from small amounts of metals or metalloids present under the proper furnace conditions (oxygenation or reduction). When first made, glass is usually a characteristic translucent "bottle" green, caused by the universal impurity of iron in both the ferric and ferrous states. Iron and copper can make nearly any desired glass color. In addition to these two, cobalt (with its rich purplish blue) and manganese (for violet or to clarify glass) were common articles of commerce. Opacifying glass requires antimony, tin, or other ingredients or the presence of many bubbles. In antiquity, true black glass was unknown, and black was really a deep green from iron or a deep violet from manganese.

Because of the considerable danger of intrusive beads in an assemblage, an understanding of more recent coloring materials is useful. Translucent red with gold (or more recently selenium) was not known in Europe until the early 17th century, though the Chinese made a duskier red with copper from the 11th century or so. Uranium for greens and yellows, cadmium sulfide

for opaque yellow, and the bright greens and yellows of chrome are all markers of more recent beads.

THE DECORATION OF BEADS

BEADS CAN BE DECORATED in any number of ways, usually by altering or adding something to their surface. Descriptions of decorations should be as straightforward as possible, using easily understood terms such as "zone" (for lines encircling the beads), "longitudinal stripes", "waves", and so on. Many beads are decorated with spots, rings, or a combination of these. These are commonly called "eye" decorations, a term which is especially legitimate in regions where the Evil Eye superstition plays an important cultural role (Fig. 3g).

Glass beads are almost never "painted", and this term should not be used unless paint was applied to a given bead. Glass beads are decorated by having other colors of glass put on them. To refer to this as "enamelling" is also misleading and is to be avoided.

Certain stone beads, especially the chalcedonies, have been given surface decorations. In some cases, the beads were turned brown or black in patterns by the same technique used to make onyx from banded agate with some sort of resist added to the areas which were not to receive the color. White lines made with the addition of soda are sometimes added to these beads or are put on plain carnelians. This is known as "etching", though acid is not involved. These techniques originated in India over 4,000 years ago, and may have spread to this region at a later date, (Plate 7).

THE SIZE OF BEADS

BEADS ARE MEASURED IN two directions. The "length" refers to the length of the axis of the bead, an imaginary line going through the perforation, and usually equal in size to the perforation. The "diameter" of a bead is the widest spot parallel to the perforation (Figs. 3a, 3b). Only rarely, as with cubical beads, will more than two dimensions be necessary to record.

Plate 6. A typical group of beads on the market in the Philippines. The small monchrome beads are the drawn "Indo-Pacific" bead, made in Southeast Asia from the 2nd to the12th century A.D. The small blue and white bead is a Chinese imitation of a European bead (16th century). The long red and blue beads are Chinese (14th-15th century). The bead with the twisted stripe is from East Java (9th-10th century). Such a collection is common on the antiquities market, though has no chronological value.

Measurements should be made and recorded carefully. A Vernier caliper is an appropriate and easily accessible tool for this work. Measurements are commonly done in tenths of a millimeter. The width of the perforation bore should also be noted.

Although measurements may be thought of as a mere exercise in the cataloguing process, there are cases when the size of beads becomes crucial. One is the diameter of disc beads to determine if they were made by the "heishi technique", as discussed above. Another is the size of the perforation bores to establish what sort of tool was used to make the hole. Another may be purely technical : Indo-Pacific beads are cut from tubes and reheated to round them, but after a certain size (about one centimeter), it is no longer possible to round off segments by heating and tumbling them, and such large beads must be "pinched" off the tube while hot, thus accounting for this variation.

BEYOND DESCRIPTION

AS WITH ALL FIELDS OF knowledge, once preliminary groundwork has been laid, subsequent work expands exponentially. Bead research has advanced greatly in the last few years. One objective for this research is to identify and catalogue all known beads by country and by region. For this work to proceed, specialists in the various disciplines of the human sciences can contribute

by presenting accurate and comprehensive information about the beads which they encounter.

In order to describe a bead adequately, one must state its material, form, color, size, decoration, and where appropriate, its method of manufacture. Each bead must be treated as a separate entity, for as with potsherds, coins, or other artifacts, each has its own story to tell.

What is the goal of bead research? It is not the understanding of small perforated objects. Rather, it is using the information about these objects to enlighten us about past human behavior.

Because of their ubiquity, their importance to many people, and their many technical refinements, beads have much to tell us about ancient and remote societies, including areas of human conduct which are generally hard to discern by the more usual investigative methods, such as social interactions and stratification, aesthetic sensibilities, and magico-religious beliefs.

Once the task of identifying and classifying beads has been complete, we can then begin to ask other questions.

These questions can be subsumed under four major headings:

1. What is the origin of the bead? What is the source of its raw material, how was it exploited and by whom, and how did it get to the bead makers? How did the bead makers learn to make beads, what is their guild or familial associations, what is the source of their traditions? What tools did they use, what are the names of the tools, and what do these names signify? What was the status of the bead makers and how did that affect the commerce in the beads?

Plate 7. The patterns on these chalcedony beads were artificially added. The black and white beads were first blackened and then the white lines were added. From Ban Don Tha Phet, Thailand ca 4th century B.C. National Museum, Bangkok.

2. How did the bead get to the site? What was the nature of trade, whether grifting, bartering, or some form of money economy? Who were the traders and how were they related to the bead makers and the ultimate customers? Was there any altering of the beads by the traders or the customers after they left the bead makers' hands? How were the beads traded: loose, strung, or made up into pieces of jewellery? Was there any secondary trade in the beads and who was involved in that? (Plate 8).

3. How was the bead used? For the decoration of humans, clothing, animals, or inanimate objects? As a store of wealth, a means of debt payment or as currency? As a treasured heirloom, some of which are a thousands years old in the Southeast Asian context? For counting, as on a prayer strand or rosary? As social diacritical markers, denoting age, gender, marital status, group status, or distinguishing one people from their neighbors? As magical charms, either as amulets to prevent harm or talismans to bring luck? Or as ceremonial or religious objects interwoven into the social fabric of the community?

4. How did they leave the systemic (living) context of the site? Were some of them purposely deposited in graves, hoards, or foundation deposits? What about the others? Were they lost, discarded, or

abandoned? What does the pattern of lost beads at a site tell us; can it indicate a trap, a stress point, or an area of secondary refuse or distinguish between indoors and outdoors? What does the presence of a very large number of beads mean? What does the absence of beads tell us? Can we detect the curation of beads over time? If the beads were gathered in the ethnographic context, under what circumstances were they given or sold to the anthropologist? How long had they been in circulation? What can the current distribution of certain bead types tell us about social interactions?

Each of these questions, and many more as well, are legitimate problems in the inquiry of the human story. Beads cannot tell us about all of human history, having limitations, but do have much to contribute to a more rounded view of that history.

As was said before, bead research has made tremendous progress in the past few years. Scholars will ignore this only at their peril. With the advances in bead research and the materials now available, it behooves the serious student of the past to use this potential to its greatest extent. At a minimum, the trustworthy, speedy, complete, and accurate description of the beads at hand must become a task for all interested in the complexities of human life.

Plate 8. The "core beads" of Early Islamic Period (7th to 12th centuries) consisting of coral, lapis lazuli, carnelion, onyx, and gold-glass beads. These beads are constantly found on Middle Eastern sites of this age. All these beads originate in the Muslim world, except for the onyx/carnelion. Soon, however, the agate producing areas of western India were conquered by the Muslims. This shows that the Muslims, while being great bead traders, were self-sufficient in their own trade and willing to wage war in order to expand it. (Gold-glass bead 1cm diameter).

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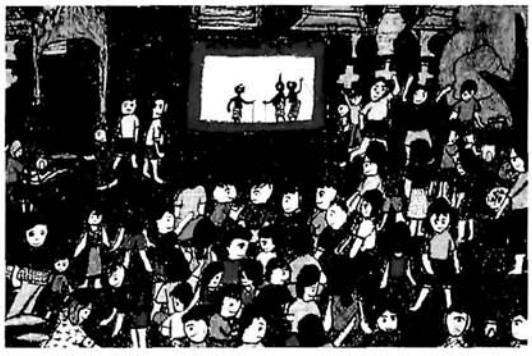
"NANG-TALUNG" PAWEENA IAM-IN



"TRADITIONAL GAME" UMPAWAN SINGHAWIBOON

"DOVE'S PAGAENT" ARKHOM SING-NGAM

"ASEAN CULTURE" SUKANYA PUTWANDEE