STONE BEADS AND THEIR IMITATIONS

Robert K. Liu

Simulations of precious-stone beads began to be made as soon as feasible materials became available. From antiquity onward, we have replicas of stone beads made of glazed stone, faience, and other ceramics, and glass. In contemporary times, glass and plastic have become the predominante substitutes for stone beads, although materials of organic origin, such as bone and tusk, have also been used. Information is presented on the background, materials, and techniques for detecting such simulations, using primarily visual clues provided by macro color photographs.

BACKGROUND

During the Stone Bead Symposium at Bead Expo '96, the bead community had an opportunity to hear from professional archaeologists capable of analyzing their bead finds with high technology and precision. In this article, I address the opposite: extremely low technology, performed essentially with the hands and eyes. Most independent bead researchers, who are not affiliated with any particular institution, work this way, often with no access to even rudimentary equipment such as dissecting microscopes or hardness points. By comparison, if one is associated with a museum, university, or government research agency, there are both colleagues in related fields who are available for consultation and/or help in physical testing and, similarly, have access to both basic and sophisticated viewing and testing equipment. The bright side for the unaffiliated student of beads is that their tools and skills are very portable and simple, thus easily applied. Eyesight and wits are what they use when looking at or collecting beads, all based on comparison and conjecture. Thus, the appearance, hardness (as tested by rubbing against the teeth), and weight of beads serve as the primary clues. Often, the opportunity to observe beads is spur of the moment, without a further chance to study them with any instruments, at leisure, or with access to comparative material. But as exposure to beads increases, knowledge builds, so that our database and skillbase enable us to become better visual analysts in detecting simulations and imitations of any type.

Central to this supposition is that one have a knowledge of the prototype, as well as the materials used to produce copies. Historically, relatively few materials were used for imitating stone beads and, with the exception of dZi beads, such activity is really the backwater of simulation. The truly exciting copies today are of materials other than stone, such as glass and polymer.

Imitating beads is possibly the second oldest profession in the world. We can only go back to about 5,000 B.C. for copies of stone beads, as revealed by a strand of tabular obsidian beads from Iraq at the Sackler Gallery of the British Museum, where one imitation is made of unfired clay. Dr. Mark Kenoyer (1994) has looked at the Indus Valley or Harappan civilizations and shown that faience was used for copying turquoise, which also occurred in Badarian Egypt. Brunton (1928) has stated that these copies were so good that contemporary field archaeologists were frequently unable to differentiate between turquoise and its faience imitation. Such fidelity is a rarity, except possibly with current dZi simulations, as most copies lack this quality. This is puzzling, as the peoples who wear and use beads are constantly exposed to them, and are keen and astute observers; why would they be fooled by some of the outlandish copies that are on the market?

I theorize that economics drives this acceptance of fakes. Accurately copying the original of any bead entails so many variables that it is nearly impossible to do so and have an economically viable product (Liu 1980b). If one can use a feasible substitute for a rare, expensive, or difficult-to-work material, someone in the market will accept this copy whether or not it is true to the prototype. Fairly soon, that it is a copy no longer matters; it becomes symbolic of the real one and gains acceptance. There are obvious economic rewards to such acceptance, as seen in the battles waged between various beadmaking countries (Liu 1974, 1987b). The imitation may even be better than the prototype because synthetic materials are usually lighter and produce a more regular configuration, all of which facilitate the stringing of beads into necklaces.

I feel that few bead users are really fooled by simulations, only those who are beginning collectors or those who are looking for bargains and permit a low cost to sway their judgement. In either of the latter categories, ignorance of the prototype or the inability to recognize materials is to blame. Ironically, to experienced bead collectors, clever copies are often more exciting and interesting than the real beads.

MATERIALS

Materials used for making copies are not that numerous. Natural substances simulating natural materials include stones or ivory imitating other stones. Examples include dyed walrus ivory for jadeite or possibly malachite, dyed steatite for lapis, and howlite for turquoise. Of synthetic materials substituted for natural substances, faience, glass, and plastic have been used the most for stone imitations; ceramics other than faience have only been utilized on a minor scale (Liu 1992, 1995; Ogden 1982). (Here, the term synthetic means human made, not in the context used for gemstones whereby the synthetic simulation has the same hardness, chemical composition, etc., as the prototype.) In the Industrial Age, imitations in glass and plastic superseded all others. Perhaps 80% of the copies we see fall within the last two centuries.

Thus, stone imitations are neither numerous nor that difficult to detect, although the current practice of making stone replicas to ease collecting pressure on the prototypes may create a new problem. Some of these replicas are being produced under the direction of an archaeologist (Kenoyer 1996). Others are being made at the request of a dealer for the purpose of reintroducing the beautiful shapes of ancient beads into the market (Kamol 1998:pers. comm.), while still others are probably forgeries of expensive ancient beads (Liu 1998). Some of the stones used for the replicas are the same as those utilized for their ancient prototypes; others may never have been so used in the past. Unfortunately, just as glass replicas have been aged to simulate great age, similar procedures can be applied to stone replicas. With hardstone replicas, artificial aging may not even be necessary, since many of the ancient prototypes are in excellent condition and show few apparent signs of wear. The ultimate detection of good replicas may depend upon an examination of silicon casts of the perforations, or electron microscope photos of the different surfaces left by both ancient and modern production methods (Gwinnett and Gorelick 1996). The presence or absence of microscopic wear on suspect beads, such as micro percussion scars derived from long use, may be diagnostic as well.

Supposedly, even such minute details have been applied to the large number of imitation dZi beads now on the market, most likely produced in Taiwan or elsewhere in Asia (Hibler 1997). Simulated dZi beads are among the most sophisticated of stone imitations; previous efforts have ranged from crude to excellent (Liu 1995), but since the onset of the Asian demand for these etched agates, the copies have greatly improved. At least advised by those with a thorough knowledge of such beads and their technology, the forgers may also have benefited from the extensive exchange of information on dZi beads that has occurred since the 1980s (Allen 1982; Ebbinghouse 1982; Francis 1982, 1992; Liu 1980a).

Besides simulations, replicas, imitations, and copies, there are other phenomena encountered in the realm of beads, such as transpositions, degradations, and outright fantasies (Liu 1977, 1985, 1987a; von Saldern 1972; Zeltner 1931). These complicate the detection of imitations if one is unaware of them, but do not hamper the actual differentiation process between the real and the copy. In those rare instances when the study sample is limited, such as in the case of an etched carnelian bead with human figures (Davis-Kimball and Liu 1981), the difficulty arises from having no comparative material.

EXAMINATION AND DETECTION TECHNIQUES

Basic requirements for the detection of fakes and imitations are eyesight, a loupe, and the hands to feel the texture and heft of a bead. Almost always, the copy will not weigh the same as the original, usually less. If one is able to identify glass and plastic, one can detect the majority of fakes. Mentally comparing the weight of the specimen at hand versus the original is greatly facilitated if one is familiar with the relative weights of glass and plastic. Most experienced bead researchers also tap or rub a bead against the incisors to help determine if an example is stone, glass, or plastic. While possibly not very sanitary, the vibration or feel of the material against the teeth can usually tell the tester to which of the three categories a bead belongs, as well as the relative hardness of its medium, which is comparable to how hard points are used in determining the hardness of gems on the Moh's scale.

EXAMPLES OF SIMULATIONS

During the illustrated lecture from which this article is adapted, about 90 slides were used to illustrate the various types of stone beads and their imitations, as well as other materials frequently mistaken for stone by bead collectors, such as coral. Here, due to space considerations, the number of examples has been reduced to 18. Consequently, many bead types, materials, and historical periods will not be examined.

The Ancient Middle East

The precious materials of antiquity consisted not of diamonds or colored gems, but what we would now consider semiprecious stones, such as amazonite, lapis lazuli, agate, carnelian, onyx, and rock crystal. All the beads in Pl. IID (top) are unprovenienced specimens from the Middle East, mostly Afghanistan; a number date to the Neolithic period. The agate leech bead (Pl. IID top, lower right) is especially interesting since this is one of the eminently collectible beads and was until recently quite rare. Described by Beck (1941) and considered by him to be "especially connected with India," both the classically thin types and the thicker types (Beck 1941:Pl. IV, Nos. 8-9) are increasingly available, either as genuine examples, or probable fakes and/or replicas (Liu 1998). The occurrence of the thicker type in recent finds from the Middle East and China may provide important clues to trade with India.

Ancient Egyptian simulations of lapis lazuli in glass and faience are shown in Pl. IID (bottom). In the upper row, a glass and a faience specimen (left and center, respectively) lie next to an ancient lapis tabular bead from Afghanistan. The lower row depicts two ancient Egyptian drop pendants of glass (left side) and one of faience compared to an ancient hexagonal bicone lapis bead from Afghanistan (right). These are close in color but the shiny surface of the glass and faience contrast sharply with the dullness of the real lapis. The Egyptian glass drop pendants (often found in near-pristine condition) definitely date to the 18th Dynasty; the other faience beads and pendants may as well.

A much closer match occurs between ancient Egyptian amazonite beads and their faience copies. In Pl. IIIA (top), the four beads on the left are faience; the three on the right are their stone prototypes.

Other ancient Egyptian imitations of stones are shown in the upper row of Pl. IIIA (bottom). These are, from left to right, faience copies of amazonite(?), turquoise, and carnelian. The lower row depicts ancient beads of amazonite, glass (because I had no example of ancient Egyptian turquoise), as well as a carnelian cornflower pendant. It is readily apparent that the faience version of the cornflower bud is much better made than the stone original, and utilized much less labor. Most faience ornaments were mold-pressed, while their stone counterparts required extensive lapidary work. This contrasts with the Chinese philosophy of imitation, where the labor saving is not always apparent or possibly does not even matter much. Egyptian skills in faience and glassworking were utilized to supply the large demand for ornaments necessitated by the funerary practices of the period, and reached a peak in the 18th Dynasty, especially as regards faience ornaments.

Asia

Two undated beads found in ethnographic contexts in Indonesia are shown in Pl. IIIB (top). Even Adhyatman and Arifin's (1993) study of the beads from this large archipelago contains no information on these specimens. The impressed crumb-glass bead in Pl. IIIB (top, right), probably of Chinese manufacture, may be an imitation of the native bead of fossilized dinosaur bone (left). An unidentified softstone with dendrites (not shown) may have also served as a prototype for the glass version which, interestingly enough, is the most expensive of the trio.

DZi beads of the Himalayas are among the most sought-after and valuable of stone beads, and therefore subject to much copying. This was practiced in the past and is still being done, with some of the contemporary imitations in agate being among the best and most difficult to detect. Until very recently, this was one of the most active areas of bead collecting, especially in Asia, accompanied by concomitant numbers of publications (Chang 1993, 1995; Jones 1996; Lin 1997; Tsering and Tenzin 1998). The examples shown in Pl. IIIB (bottom) are easily detected, ranging from a hard plastic (left), often with a metal core to add weight, to one in polymer (center) and a painted aluminum example (right).

Chinese beadmakers, who rank numerically just behind the Czech and related bead industries as a source of simulations, will go to great lengths to make imitations which, when measured by Western values, hardly seem to warrant the effort. Ceramic imitations of stone beads are not common; in Pl. IIIC (top), the right-hand specimen is a porcelain imitation of turquoise, real examples of which are represented by the spherical bead and balustrade bead combination comprising the counterweight of a court necklace. While the latter may be made from pressed turquoise and thus lack any veining, the imitation has painted glaze representations of these features. In Pl. IIIC (bottom), a contemporary carved jadeite pendant (left) is compared to imitations in glass (right) and dyed walrus tusk (center). There is some question as to whether the latter are copies of jadeite or malachite. The wax seal on the glass *pi* was supposedly applied to all Chinese exports over 120 years old.

Further examples of labor-intensive simulations are found in Pl. IIID (top). This shows a carnelian imitation in drawn glass of a Chinese cane bead (left), a drawn, molded, and ground glass panel bead (center) and another panel bead made by molding and grinding (right). The amount of labor expended to produce the two panel beads is comparable; it is undetermined if any one method is faster or less laborious. Such imitation panel beads are about 1.5 cm long. Chinese glass archers' rings, made to imitate jadeite, other hardstones, and tortoise shell, were also copied in glass (Pl. IIID bottom). One of the difficulties in judging fidelity in such Chinese artifacts is the lack of knowledge of the stone prototypes.

Malachite is another semiprecious stone that has been well simulated. In Pl. IVA (top), real malachite beads (right) are compared to Japanese glass imitations (left). The fidelity of these copies is very good, although the banding in the glass is slightly more prominent than in the real stone. Japanese glass *ojime* often provide good examples of stone simulations.

Africa

Africa is one of the richest sources of imitation stone beads. Unusual simulations from Africa include silicon rubber or Silastic imitations of agate beads, imported from Burkina Faso (formerly Upper Volta); purchased over twenty years ago, these are now becoming sticky as this compound ages and deteriorates (Pl. IVA bottom, left). Czech molded-glass copies of chalcedony beads are more common. In Pl. IVA (bottom, center) they are strung on the same strand as real chalcedony beads, probably products of the Cambay industry. The glass versions exhibit diagnostic longitudinal mold seams. The latter strands are probably from the Ivory Coast. On the right-hand side of Pl. IVA (bottom) is a strand of ancient chalcedony beads from Mali, many in tabular or lenticular forms.

Among my personal favorites are the copies of gneiss and granite beads from Mali. Pl. IVB (top) shows real stone beads, as well as European and African-made copies in crumb-glass or powder-glass, often in colors that do not resemble the real material. Most of the crumb-glass simulations are European, although there are also some made in Africa. The glass crumbs are often only sintered, but imitate well the coarse grains of the rock (Liu 1988).

The economic competition between bead-producing nations vying for the African trade is well-illustrated by the stone beads and their copies in Pl. IVB (bottom). Comparison of the tabular carnelian pendant from India (right) with its Czech molded-glass imitation (left) shows poor congruence, so this particular form of pendant may not have been the exact model for its European glass copy. The latter is from Mali, which has been the source of the greatest number of various Czech molded-glass pendants.

In Pl. IVC (top), the faceted-spherical carnelian bead from Idar-Oberstein (top left) compares well with the competing Czech molded-glass copy (top right), both from Morocco. The considerable difference in hardness between carnelian and glass provides a good clue for differentiation, as the facets wear and dull much faster on glass examples. Most molded-glass ornaments are identified as Czech in origin, but they could also be French or German (Picard and Picard 1995).

The lower row in Pl. IVC (top) depicts date-shaped carnelian beads from India (left) versus a molded-glass imitation of European origin (right), all probably from West Africa. These beads are the products of three countries' bead industries, the earliest being India, then Germany, and finally Czechoslovakia which won this economic war (Liu 1984, 1987b).

Pl. IVC (bottom) compares dyed agate pendants from Idar-Oberstein (bottom row) to the smaller molded Czech glass copies (2.5 cm long) in the upper row. Note that the harder stone pendants wear better and thus still retain their polish, in contrast to the almost matte surfaces of the glass ones. With these examples, the match between prototype and copy are fairly reasonable, except for size and the exact contours. While the Bavarian stone industry's ornament output was prodigious, we know fairly little about the specific types that were produced or their possible Indian prototypes (Ruppenthal n.d.; Trebbin 1985).

REPLICAS

Individual archaeologists like J. Mark Kenoyer and government institutions, such as in China, are now encouraging the production of replicas of ancient beads in an effort to satisfy the demands of the collecting market, reduce illegal digging for prototypes, and sustain the local craftspeople.

Carnelian

Pl. IVD (top) shows two carnelian replicas of ancient long bicone beads made by Inayat Husain of Khambhat, India, compared to the authentic piece in the center which is from Afghanistan. The two are practically indistinguishable. However, although the perforations of both have been drilled from either end, those of the modern beads are very small, having been produced using diamond drills.

Polymer Clay

Except for its light weight and softness, polymer clay is one of the best materials for simulating stones and other bead materials. A number of contemporary artists now make their own interpretations, not to copy but to demonstrate their skills. The jade, lapis, turquoise, coral, and hardstone versions in Pl. IVD (bottom) are by leading polymer artist Tory Hughes, who has developed most of the imitative techniques in polyvinyl resin (Cuadra 1993).

CONCLUSION

Collectors and professionals, such as archaeologists, ethnologists, and museologists, share a common problem: there is no easy way to distinguish real from imitation beads, no matter what the material, except by experience and trial and error. Because there are so many bead types and materials, with a sizeable portion still undescribed and new techniques constantly being developed, the learning curve for the detection of simulations is quite long. But with exposure and guidance from a mentor, one can quickly learn enough to begin identifying and differentiating very adequately, especially if one also undertakes a vigorous reading of the bead literature. Thorough knowledge is the best protection.

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Robert K. Liu