Two Bead Strands from Andhra Pradesh, India

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TWO STRANDS OF BEADS have been excavated at neighboring sites in the southern Indian state of Andhra Pradesh (Pls. I and II). The archaeological recovery of beads is very common, but excavating bead *strands* is much rarer unless they are from a burial, an offering, or a hoard. Finding two strands in sites so close together seems to defy the odds.

My intent is not to dwell on the rarity of these finds, but to use this opportunity to study beads from ancient southern India. Though beads can be worn individually, they are most commonly worn as strands. Examining whole strands allows us to study beads in their basic functional unit.

Bead research requires answers to several specific questions: (1) Where and how were the beads made? (2) How and where were they distributed? (3) What function did they serve? (4) How did they come to be in the place where they were excavated? When considering bead strands we have an additional question to ask: How do we identify an assemblage of beads as a strand? Some of these questions can be answered by studying individual beads, but others cannot. This is the advantage of studying complete bead strands rather than limiting the examination to individual specimens.

THE STRAND FROM DHULIKOTTA

Dhulikotta (Karimnagar district) was excavated in 1976–1977 under V. V. Krishnasastry, Director of the Department of Archaeology and Museums, Government of Andhra Pradesh. It was a small village occupied from the first century B.C. to the second or third century A.D.

In a structure identified as a well (Section II, Division 115, Trench A_4) 140 beads were uncovered, including a faience collar bead, a small blue glass bead, 54 opaque orange glass beads, and 84 shell disc beads. All but four of the orange glass beads were found within a 10 cm depth of each other. The faience and the small blue glass bead do not appear to be related to each other or to the other beads. However, the large number of similar white shell and orange glass beads suggests that they may have once constituted one or two strands.

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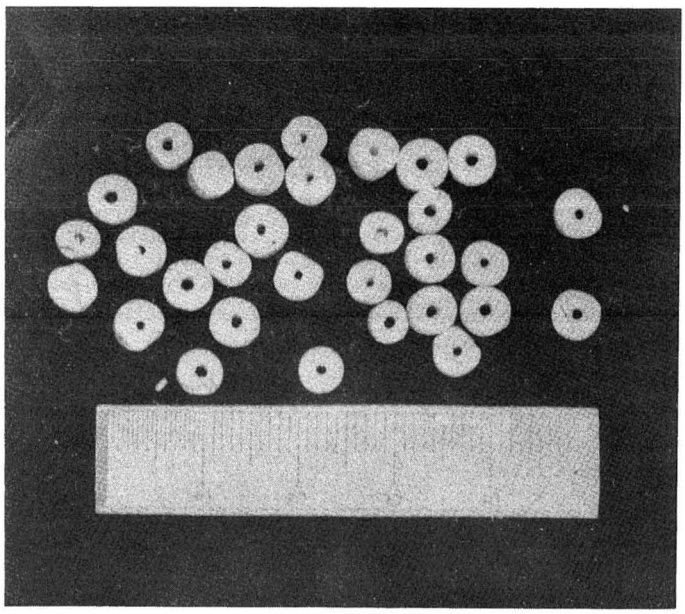
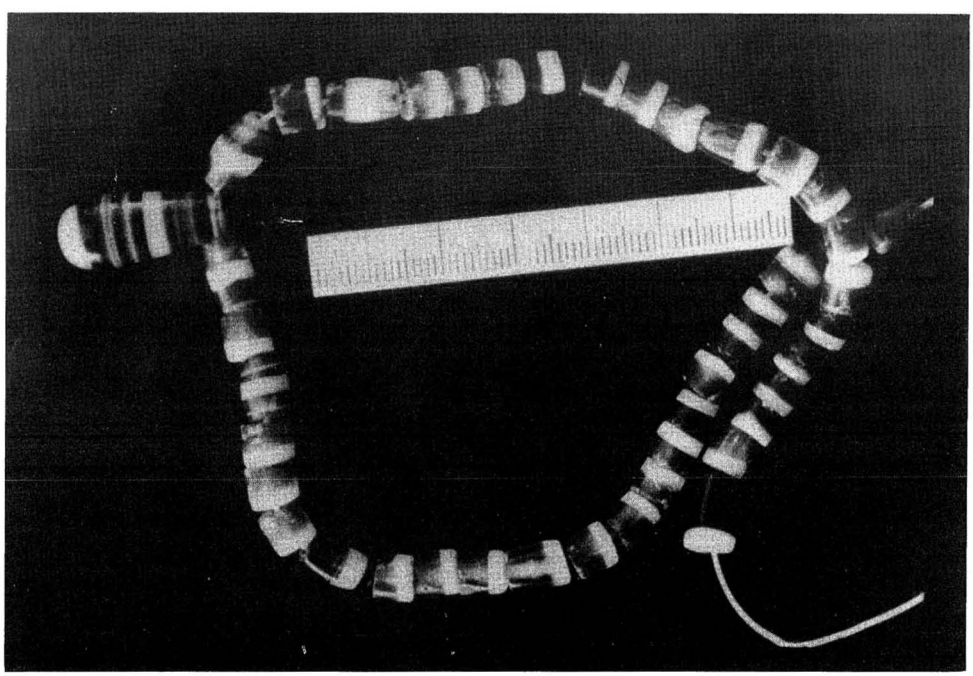


Pl. I. Some of the small disc shell beads from the well of Dhulikotta. Some are chipped. The great majority of them are within 0.22 mm of 0.5 cm in diameter, indicating that they were made by the heishi technique.



Pl. II. The necklace of agate beads treated to become onyx found at Kotalingala. The necklace is strung in the same order in which the beads were found.

The first task was to determine if a strand was involved. This could be demonstrated in the case of the shell beads.

A widely used technique to form disc beads from natural materials begins with a flat piece of material such as a bivalve shell. This is chipped into circlets, which are then perforated with a borer. After a number of rough circlets are produced they are strung on a stick or thick fiber, and the entire group is rubbed along a flat or grooved stone. This grinds the edges of all the circlets at one time. The finished product is a strand of smooth disc beads with diameters of very nearly the same size.

This manufacturing process is known as the *heishi technique*, after the Santo Domingo Pueblo Indian (New Mexico, U.S.A.) word for "shell bead." *Heishi* is sometimes erroneously applied to any disc bead. It should, however, be reserved either for this particular beadmaking technique or for shell disc beads actually made by the Santo Domingo Pueblo Indians.

The heishi technique is by no means restricted to one Arizona tribe. It is actually widespread, both geographically and chronologically. It was used to make ostrich eggshell beads during the Upper Palaeolithic in India (Francis 1982*a*) and employed in Precolumbian America (Jernigan 1978:202–205). It is currently used to make the shell "money" of Oceania (Woodford 1908:81–83; Lewis 1929:13–14; Malinowski 1922:371–374), ostrich shell beads by the !Kung (San) of the Kalahari Desert (Forde 1963:31), and shell beads by the Atayal of Formosa (Chen 1968:213–215). These scattered examples indicate the wide distribution of the technique. When more attention is directed to bead studies we may well learn that it is virtually universal.

In the case of the shell beads from Dhulikotta, we are simultaneously asking two complementary questions. If it can be determined that the beads were made by the heishi technique, this would also demonstrate that these particular beads were made together. Since they were found together, it would be evidence that they were distributed and worn together as a strand.

If these beads were made by the heishi technique their diameters would be very similar. I measured the 75 unbroken specimens (of 84); the results are recorded in Table 1.

Of the 75 beads measured, 64 (85.3 percent) had diameters within 0.2 mm of 0.50 cm. The 0.2 mm difference is too minute to be detected with the naked eye. Some

TABLE 1. DIAMETERS OF THE MEASURED SHELL BEADS RECOVERED IN THE DHULIKOTTA WELL

DIAMETERS IN CM	NUMBER OF BEADS
.55	1
.54	0
.53	0
.52	12
.51	14
.50	28
.49	4
.48	6
.47	6
.46	4

Note: Mean = .4990; median = .50; mode = .50; standard deviation = .0176; variance = .0309.

tapering is to be expected with the heishi technique, and minimal tapering is evident. As for the "gaps" in the size distribution (no beads with diameters of 0.53 or 0.54 cm), they might have been filled if I could have accurately measured the broken beads. Thus, the hypothesis that the beads were made by the heishi technique has been verified; no other known prehistoric beadmaking method could have produced such uniform results.

Establishing how these beads were manufactured indicates that they were made as a strand. Since they were made and disposed of together we can reasonably assume that they were distributed and worn together. Hence, several questions about these beads have been answered that could not have been determined by examining only a few of them.

The orange glass beads present a different problem. These beads were important in early historic India (Beck 1941:27; Francis 1982*b*:3), but it cannot be demonstrated if this group from Dhulikotta was once strung together, strung with the shell beads, or lost individually.

However, it is not unreasonable to believe that the orange glass beads were once strung with the shell beads. The two types of beads are much the same size. The glass beads are slightly tapered; the mean diameter of their larger side is 0.4588 mm, while that of the shell beads is 0.4990 mm.

The total length of the two groups also suggests that they were strung together. The 84 shell beads (averaging 0.23 cm in length) form a strand about 23.5 cm long. The 54 orange glass beads (average length 0.20 cm) total 10.8 cm in length. By themselves the shell beads are long enough for a bracelet or a child's necklace, while the orange beads could have been used alone only for a child's bracelet. (There are, of course, other ways in which beads may be worn, but bracelets and necklaces are the two most common.) Their total combined length of 34.3 cm is reasonable for a necklace for an adult or a child. Thus, it is quite possible, though unproven, that the orange glass beads were strung with the shell disc beads.

We cannot know the circumstances under which these beads got into the well. However, wells are excellent places to lose beads; a strand could easily break while its owner was drawing water, and it would be lost forever after it had fallen into the well.

In sum, the study of the shell beads as a group has answered how (but not where) they were made, the condition in which (but not how) they were distributed, and how they were used, and it suggests how they were deposed. The orange glass beads may have been on the same strand, but we cannot prove that.

THE STRAND FROM KOTALINGALA

Kotalingala, also in Karimnagar district, was a city, and much larger than Dhulikotta. It was bounded by a rectangular wall 1054 m by 333 m in extent with watchtowers at the four corners and jetties on the north side projecting into the Godavari River. The site, also excavated under V. V. Krishnasastry of the Department of Archaeology and Museums, is dated from the fifth to the first centuries B.C. and was excavated between 1980 and 1985.

The strand from Kotalingala was almost, but not quite, uncovered in situ. It lay at the edge of a trench (B_4, division 195, Section I, layer 3) filled with roof tiles and other building rubble, and had been cut through before the excavators realized what had happened. It was found only a few days before my visit; the clear impression of

a line of beads was still visible in the side of the trench upon my arrival. Hence, there is no doubt that these beads formed a strand.

The 44 beads were made of banded agate lightly caramelized to form white and brown onyx. There are 36 short cylinders (0.50 to 0.59 cm long; average diameter 0.60 cm), 7 slightly longer and wider barrel-shaped beads, and a single drop pendant 2.43 cm long. Together they form a symmetrical necklace (one of the barrel beads seems to be missing) with a central pendant. A few other finished beads were found near the necklace at the same level in the trench. These included two small oblate amethyst beads (0.55 and 0.40 cm diameters).

Kotalingala supported a semiprecious stone bead industry. A surface survey I conducted identified three beadmaking loci, two of agate/onyx and one of amethyst. A study of the bead waste material from these loci indicated that the beads made at Kotalingala were produced by manufacturing techniques that parallel those known for semiprecious stone beads elsewhere in India (Francis 1982*c*:3–7, 34–37). Several beadmaking tools, including a percussion point, a grinding stone, and two polishing stones were also uncovered during the survey (Francis 1986). There is no doubt that the necklace was a local product.

The method and place of manufacture were demonstrable without the finding of a strand. The configuration of the strand did demonstrate how the beads were worn. However, one intriguing question remains: how was the necklace lost? For the necklace does appear to have been lost; there was no indication of a burial, offering, or hoard where it was discovered. But people do not usually lose entire necklaces of semiprecious stones. There were no traces of traps, such as wells or latrines. All we know is that an onyx necklace was found near the administrative center of the city in conjunction with some other finished beads that were not part of the necklace itself.

I suggested to the excavators that the necklace may mark the remains of a commercial establishment that dealt at least in part with beads. A very high loss rate for beads is found wherever they are made or sold (Francis n.d.). A visit to any past or present beadmaking establishment will confirm this. The presence of the amethyst and jasper beads bolsters the supposition that the onyx necklace was in a bead storage area.

A whole necklace can be lost in a shop much more easily than in a private home. We can imagine a dialogue such as this taking place in a shop: "Hey, I thought we had ten of those onyx necklaces!" "Did we? Maybe my wife sold one when I was out yesterday; I'll have to ask her." In a home, someone would more likely wonder, "Now, where *is* my [one and only] onyx necklace?"

The discovery of a necklace at Kotalingala has clearly demonstrated at least one way in which the beads made at the site were configured for use. It has also raised the possibility that the findspot is at the location of a bead distribution point (such as a shop).

CONCLUSIONS AND IMPLICATIONS

Two bead strands excavated in Andhra Pradesh, India, were examined to furnish evidence about their manufacturing, distribution, use, and loss. I have been especially concerned with evidence not obtainable by studying individual beads alone. In both cases, examining full strands of beads yielded evidence that could not have been uncovered by studying individual beads alone.

The assemblage of shell beads from the Dhulikotta well allowed me to identify

the manufacturing process used to make them and confirmed that they were made by the heishi technique as a strand. In turn, this finding indicated that they had been worn, distributed, and lost as a strand. It also suggested that the activity around the well may have been responsible for the loss of the beads. The orange glass beads may well have been strung with the shell beads, but this remains unproven.

In the case of the Kotalingala necklace, the manufacturing process was understood, and it was known that the beads had been made locally. The discovery of the entire necklace furnished information on the symmetrical arrangement of finished necklaces. The finding of an entire strand of relatively valuable beads calls for an explanation. I have proposed that the beads were found on what may have been the site of a bead depository, such as a store, a suggestion made more likely by the discovery of other valuable and unbroken beads nearby. If this suggestion is correct, evidence of the distribution of beads and the point at which they were made into finished necklaces have been uncovered.

Examining these two strands has revealed information about the most personal of nonutilitarian artifacts, human adornment. Much of what was learned would not have been readily apparent, if at all, by studying individual beads in isolation. Considering these beads as strands widened our understanding of the human activities connected with them. The possibilities of learning more about the origin, distribution, use, and disposal of beads have by no means been exhausted here. It is hoped that this paper will serve to suggest how other studies may be carried out in the future.

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