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Cover: Seneca effigy ceramic smoking pipe from the Dann site, New York, with inlaid red glass beads for eyes (on loan to the Rochester Museum and Science Center, courtesy of the Rock Foundation) (see article p. 3).

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KARLIS KARKLINS, editor

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CERAMICS AND GLASS BEADS AS SYMBOLIC MIXED MEDIA IN COLONIAL NATIVE NORTH AMERICA

Gregory A. Waselkov, David W. Morgan, and Billie Coleman

During the 17th and 18th centuries, Native Americans rarely adorned ceramic objects with glass beads, despite the millions of beads introduced by Europeans through trade. Bead-decorated ceramics have been reported from only nine sites in North America, perhaps due to a tendency for archaeologists to overlook or misclassify bead-inlaid pottery. The 40 artifacts represent widely divergent ethnic groups separated from each other culturally, as well as by great distances in space and time. Yet they display a remarkable consistency in the pattern of bead arrangement and use of color. Colored glass beads stand in for human eyes in effigy smoking pipes and white beads encircle the mouths of pottery vessels. Rather than examples of idiosyncratic coincidence, crafters of these objects communicated broadly shared ideological metaphors. These rare artifacts speak to the interconnectedness of ancient Native Americans and to related worldviews developed over centuries of intercommunication involving mutually intelligible symbolic metaphors.

INTRODUCTION

Glass beads figured prominently in exchanges between colonizing Europeans and the Native peoples of North America for hundreds of years. Readers of this journal are well aware of the great diversity of forms, colors, and styles of manufacture that characterize the millions upon millions of drawn, wound, blown, and mold-pressed beads produced in glasshouses large and small across Europe and carried to North America from the late 15th to 21st centuries. Thanks to innovative scholarship by ethnohistorians and archaeologists, we now understand to some extent how Native American beliefs and preferences shaped this trade (e.g., *see* Hamell 1983; Loren 2010:55-87; Miller and Hamell 1986; Turgeon 2004; Waselkov 1992:44). Early demands for metaphorical counterparts of rare sacred materials like marine shell and natural crystals transformed with time to large-scale requests for beads of particular sizes, shapes, and colors for ornamentation of bodies and clothing. In all cases, American Indian worldviews determined selection, acquisition, and use of glass beads. While many beads were worn in long strands as necklaces, they also figured prominently in embroidery and clothing fringe, adorned bracelets, anklets, and headbands, dangled from noses and ears, and were interwoven with human and other types of hair. Occasionally glass beads were combined with other media, most commonly inlaid into wood, usually in patterns that conformed to traditional Native design motifs, at least at first (Bradley and Karklins 2012; Hamell 1998:280; for an exception, *see* Willoughby 1908:429).

In recent years, a bare handful of ceramic artifacts, no more than several dozen specimens, inlaid with glass beads have come to our attention from archaeological sites in North America. While the extreme rarity of this artifact class might argue for its historical and anthropological inconsequence, we have resisted the temptation to dismiss these odd items as idiosyncrasies, mere whimsies of bored potters, and now believe they carry important information about the people who made and used them. Indeed, the fact that the glass bead components of one object went unnoticed for close to a century as it lay in a prominent research collection and that the beads of others were initially misidentified as pearls leads us to wonder if more, perhaps many more, bead-inlaid ceramics have been found but simply not yet recognized. Thus, this article has two modest goals: 1) to raise awareness of the potential for historic ceramics with glass bead inlays and thereby encourage others to reexamine curated collections for examples of the genre, and 2) to consider the meanings such artifacts held in their original historical and cultural contexts of manufacture and use.

HUMAN EFFIGY PIPES

Some three decades ago, George Hamell wrote about two remarkable smoking pipes from the Dann site (Monroe County, New York), generally thought to be the Seneca village of Gandachioragou, occupied ca. 1655-1675 (Grumet 1995:412; Hamell 1983:24, 27; Jones 2008:361-

364; Miller and Hamell 1986:319). Both pipe fragments are effigy forms with eyes represented by glass beads. One is a zoomorphic blue-eyed owl made of lead (Figure 1), perhaps made by Dutch craftsmen for trade to the Indians (Bradley 2006:170; Veit and Bello 2004:192). The other is an anthropomorphic red-eyed human head in ceramic, certainly Native-made (Figures 2-3). Hamell (1983) interpreted these striking combinations of Native and European motifs and materials as evidence for the ready incorporation of novelty into traditional Native categories of the sacred – glass and lead considered as newfound symbolic counterparts of the translucent quartz crystals and mica, reflective copper, and lustrous white marine shell traditionally considered sacred across Native North America. Far from replacing traditional sacra, these newly adopted sacred media were creatively deployed in a fluorescence of original forms that metaphorically evoked long-held beliefs in otherworldly powers. "[I]n the initial phases of intercultural trade relations, the Indians of the Woodland region were trading in metaphors and... the value of trade goods was predominantly ceremonial and ideological" (Miller and Hamell 1986:326).

Figure 1. An owl-effigy smoking pipe made of lead or pewter inlaid with blue glass beads for eyes (RF 21078) from the Seneca Dann site in western New York; 5.4 cm high (on loan to the Rochester Museum and Science Center, courtesy of the Rock Foundation).

Since publication, Hamell's argument has generally been considered persuasive and the two Seneca pipe effigies with glass bead eyes have been mentioned or illustrated many times as examples of symbolic transference (Bradley 2006:172-173; Engelbrecht 2005:53; Karklins 1992:68-69; Trubowitz 2004:149; Turgeon 2004:36; Veit and Bello 2004:191-198), a common process noted elsewhere (Panich 2014). Without necessarily comprehending every symbolic nuance underlying late-17th-century Seneca representations of eyes by glass beads, we can all grasp, at least at a superficial level, how contemporaneous Huron Iroquoian people could expand the meaning of their word for eye (*acoinna*) to French-traded glass beads (Sagard 1632:91; Thwaites 1896-1901, 17:170; Tooker 1964:112-113). Indeed, Hamell thought this conceptual link "far more extensive, across both time and space" and pointed to pre-Columbian examples, such as the famous Hopewell zoomorphic pipes, "in which beads of various materials have been used as eye-inlays" (Hamell 1983:12). Laurier Turgeon (2004:36-37) suggests the Iroquoian metaphor extends beyond the light-reflecting and translucent properties shared by eyes and glass to their physical resemblance, with the colored bead representing an iris and the bead's hole a pupil. In fact, so reasonable has this pairing of eye to glass bead seemed to modern archaeologists that some have apparently assumed many effigy pipes were so decorated (Trubowitz 2004:149). Yet the two Seneca examples from the Dann site stand alone among thousands of zoomorphic and anthropomorphic pipes attributed to Iroquoians from the 16th through 18th centuries (Chapdelaine 1992; Kearsley 1996; Mathews 1980; Sempowski 2004).

Therefore, the discovery in 2012 of another human effigy smoking pipe, native-made in ceramic, with inset glass beads for eyes from a colonial-era site in eastern North America was quite unexpected. One of us (B. Coleman) came across this pipe while cataloging artifacts excavated in 1935 at Ocmulgee National Monument in central Georgia. Ocmulgee is primarily known as a major Mississippian mound center dating circa A.D. 1000-1150, but one or more Lower Creek Indian towns reoccupied the abandoned mound center from 1690 to 1716. Between December 1933 and March 1941, the U.S. National Park Service (NPS) oversaw extensive excavations at Ocmulgee, routinely employing hundreds of laborers paid by a variety of federal relief programs during the Great Depression (Hally 1994:1). Most of the enormous artifact collection generated all those years ago remains unstudied and unreported, but the current staff of the NPS Southeast Archeological Center in Tallahassee,

Figure 2. A Seneca effigy ceramic smoking pipe from the Dann site, New York, with inlaid red glass beads for eyes (RF 900-28); 21.5 cm long (on loan to the Rochester Museum and Science Center, courtesy of the Rock Foundation).

Figure 3. Detail of the face of the effigy smoking pipe from the Dann site (on loan to the Rochester Museum and Science Center, courtesy of the Rock Foundation).

Florida, is actively cataloging the Ocmulgee backlog. In the course of that retrospective processing, Coleman noticed the presence of glass beads pressed into the eye sockets of a crudely modeled human-face pipe (Figures 4-5). Unlike the Seneca examples, this Creek pipe bowl fragment has two glass seed beads in each eye recess, attributes evidently overlooked or unrecorded at the time of excavation. The artifact's original catalog card describes object "39-7751/1B1 3" simply as an "Effigy of Human Face, Painted Red" from Mound D. Archived field and laboratory notes do not yield any more specific provenience for the find.

Mound D at Ocmulgee is famous in the history of southeastern North American archaeology for the discovery of a prehistoric cornfield. Archaeologists revealed agricultural ridges and furrows carefully and intentionally preserved by burial beneath initial mound deposits (Kelly 1938; Riley 1994). The beaded effigy pipe was found somewhere in the vicinity of Mound D early in the Ocmulgee excavations, when the prehistoric Mississippian occupation dominated fieldwork goals. Only in 1939-1940 did attention shift to the historic Creek occupation, when Charles Fairbanks directed the excavation of a palisaded English trading house and associated Native houses and burials (Kelly 1939; Waselkov 1994). That fieldwork, and subsequent dissertation research by Carol Mason (2005), defined the extent of the historic Creek occupation at Ocmulgee between Mound C to the west and the trading house to the east. Recent remote sensing has expanded those limits considerably to the north,

Figure 4. The human-effigy pipe from Ocmulgee, Georgia, with inlaid glass bead eyes (courtesy of the National Park Service, Southeast Archaeology Center, Tallahassee).

reaching to the area of Mound D (Bigman 2010; Bigman and Cornelison 2013).

With no further information available on this pipe's context of discovery, we must rely entirely on analysis of its shape and composition for further interpretation. In fact, if not for the presence of the inlaid glass beads, this effigy pipe surely would be considered Mississippian, based on its find near Mound D at Ocmulgee. But the integral presence of those distinctive, European-made trade items dates the pipe securely to the early colonial-era Creek Indian occupation of 1690-1716. The shape of the human face on the Ocmulgee specimen, and its presence on the bowl of a smoking pipe, is not entirely dissimilar to the Seneca pipe from the Dann site. Two prominent shared characteristics – eyes represented by glass beads and the unusual upturned "smiling" mouths – distinguish them from all other human effigy faces on contemporary pipes in the Northeast and the Southeast. That fact alone suggests some shared symbolic value. Yet there are also many differences between the two pipes.

The Ocmulgee Creek pipe appears to combine northern bead-eye and smiling-mouth motifs with design elements seen on effigy-head pots dating into the 17th century from the central Mississippi valley (found most often in southeastern Missouri and northeastern Arkansas). These ceramic effigy-head vessels are partially or completely painted with a red clay slip, the lips are often incised to represent teeth, and some are incised from lip to chin, possibly to represent decoration by paint or tattoo, all features also seen on the Ocmulgee effigy pipe. On many of the sculpted effigy pots, the lips are pulled back in a "death grin," and other design elements contribute to the appearance of lifeless heads (Cherry 2009; Walker 2004:223-228). Perhaps that rictus pose is the intent conveyed, as well, by "smiles" on the two pipes. While the symbolism of head pots remains ambiguous, the weight of evidence points to their interpretation as representations of ancestors or, more likely, mythical figures (Cherry 2009:173; Walker 2004:225).

One difference between the Seneca and Creek pipes concerns their use of glass beads, with one bead per eye on the Dann specimen and two per eye on the pipe from Ocmulgee. The beads inlaid in the Creek pipe are badly deteriorated, presumably due to damage from firing the ceramic pipe. The exposed surfaces of three of the four glass beads have cracked and fallen away to reveal blocky remnants embedded in the pipe's clay matrix. The pattern of longitudinal fractures suggests these are drawn beads (Kidd and Kidd 1970: Type IIa). All four appear to be a blue-green

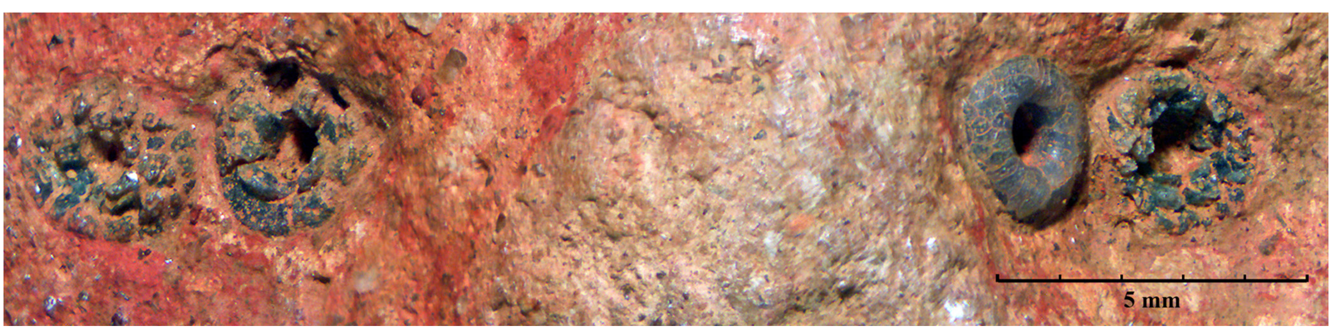


Figure 5. Close-up of glass seed beads inlaid in the Ocmulgee pipe (courtesy of the National Park Service, Southeast Archaeology Center, Tallahassee).

color, although the opacity of the intact specimen makes identification tentative. Regardless of the precise color of the Creek pipe's bead eyes, a color other than white was selected – a significant attribute to which we return later. On the Ocmulgee specimen, despite their broken and heat-altered condition, there are definitely two beads per eye, set side-by-side and on slightly different planes, with the angles of the innermost beads corresponding to the rising slopes of the nose (now largely missing). We suspect these multiple eyes and their different orientations, as well as perhaps their color, signify supernatural vision not shared by normal humans.

The presence of both bead-eye effigies on smoking pipes certainly implies they functioned within the common Native American tradition of conveying respect and supplication to Above World spirits, whether ancestral or otherwise, in the smoke emanating from pipe bowls (Rafferty and Mann 2004). While we do not understand all of the symbolism and beliefs that contributed to the creation of these human-head effigies, we recognize the use of red pigment as a sacred color (Hamell 1992; Hudson 1976:120-132; Lankford 2008:73-97). The blood-red stone of calumet pipes famously played an essential role in the creation of fictive kin relations between potential enemies in the midcontinent during the late 17th and early 18th centuries. The red glass eyes of the Seneca pipe and the red face of the Creek pipe move these artifacts out of the world of the mundane and into the sacred realm, reinforcing the message conveyed by their use of light-reflecting glass in a novel way.

POTTERY INLAID WITH GLASS BEADS

In contrast to the extreme rarity of Native-made, colonial-era, ceramic smoking pipes inlaid with glass beads, potsherds with inlaid glass beads seem positively commonplace, although in terms of actual numbers, they, too, are quite scarce. The largest assemblage, totaling fewer than a dozen sherds, was excavated in the 1930s at the Biesterfeldt site, a late-18th-century village in eastern North Dakota possibly affiliated with the Cheyenne (Wood 1971:47-49). Wood analyzed the collection years later and his published report documents 23 vessels decorated with glass-bead impressions, as well as seven sherds with glass-bead inlay. He thought the bead impressions were produced by pressing a strand of glass beads into moist clay, much as the Biesterfeldt potters made fiber-cord impressions (Wood 1971:27, 29-30, Plates 8b-c, 10d-e).

Wood described the bead-inlaid specimens thusly: "Seven sherds have inset glass trade beads, or retain their impressions. The beads, pressed individually into the moist paste, were partly fused when the vessels were fired. They are 4 mm in diameter; the few beads remaining (many have fallen out) are of an opaque, white, glassy substance" (Wood 1971:27). Five vessels have beads inset in the lip or shoulder, one of them with two beads near a lug or handle (Wood 1971:30-31). A single blue glass seed bead was recovered among other European trade goods, although lack of screening during the 1938 excavation at Biesterfeldt undoubtedly accounts for minimal bead recovery.

William Green and colleagues recently reexamined the Biesterfeldt collection studied by Wood and located other examples of pottery inlaid with glass beads in curated collections from that site and two others further west: the Cheyenne River site in central South Dakota and Fort Clark Historic Site in central North Dakota, both apparently associated with Arikara (Sáhniš) villages dating to the mid-18th and early 19th centuries, respectively (Green et al. 2015). Excavations at the Cheyenne River site in 1931 recovered one cord-impressed rim with a strap handle in which two tubular, drawn, white glass beads (Kidd and Kidd type IIIa7), both heat crazed from vessel firing, were inlaid perpendicular to the rim (Green et al. 2015). A lone simple-stamped sherd found recently on the surface of the Arikara site at Fort Clark has white glass seed beads (Kidd and Kidd type IIa13) impressed along the top of the flat rim lip. Green and colleagues point out that this sherd closely resembles a rim impressed with a cord-wrapped rod from Biesterfeldt with the same sort of seed beads inlaid in the lip (Green et al. 2015; Wood 1971: Plate 7b). They also note additional bead-impressed and bead-inlaid sherds from recent excavations at Biesterfeldt, as well as a sherd thought to have come from that site with multiple parallel-line incising and inlaid white glass seed beads (again Kidd and Kidd type IIa13) (Green et al. 2015).

Among several conclusions developed by Green and his colleagues, perhaps most important is their recognition that Native peoples of the northern Great Plains were innovating with a new material, but they incorporated it into traditional vessel forms and decorative motifs, further reinforcing Hamell's (1983) thesis about trading in metaphors. They also point out that the Arikaras (and other groups) famously experimented by the late 17th century with a far more radical reworking of European glass involving the heating and fusing of ground glass beads into pendants (Green et al. 2015; Howard 1972). By the time they began incorporating glass beads into pottery rim designs, they were very familiar with the physical properties of bead glass.

In that light, it is interesting to note that the same sorts of damage evident on the glass beads in the Ocmulgee effigy pipe are described by Green and colleagues (2015) on many of the northern Great Plains specimens – surface crazing, cracking, partial melting and distortion, closing or partial closing of the bead holes – effects we all attribute to the heat of firing a ceramic artifact. Perhaps even the dislodgment of inlaid beads, some of which are missing from nearly every specimen, may be partially attributable to heat stress. Damage to and loss of inlaid glass beads during ceramic firing is a likely (and probably the principal) reason why so few ceramics anywhere were ever produced with that mode of decoration. We wonder, though, if this survey of Native American ceramics inlaid with glass beads is not, in fact, revealing the story of a failed technological innovation, but is instead showing us the traces of a motif elaboration with a fairly narrow goal, to express a particular symbolic meaning. To explore that idea, we need to introduce our remaining examples.

During the course of analyzing a large artifact assemblage excavated in 2010 from the ethnic French La Pointe-Krebs plantation site in Pascagoula on Mississippi's Gulf coast, staff at the University of South Alabama's Center for Archaeological Studies found two small native-made pottery vessel fragments that had been inlaid with glass beads, apparently the first such specimens to be reported from the Southeast (Figure 6) (Gums and Waselkov 2015:60-61, 154). Neither one was correctly identified at first. Initially, the bowl rim sherd with beads still in place was thought to have small pearls embedded in the pottery surface. Examination with a binocular microscope quickly revealed the "pearls" to be white glass seed beads, Kidd and Kidd type IVa13. The sherd also has two and a half impressions left by glass beads that have fallen out. The little depressions or molds exhibit telltale central spires of clay that once filled the bead holes. A search of fine-screened material from that artifact's excavation context turned up a partially melted white glass seed bead that evidently became dislodged from the sherd during deposition.

Once the bead impressions were recognized as signatures of missing inlaid glass beads, the ceramic assemblage from the La Pointe-Krebs plantation was reexamined and a second sherd was found in a curated collection from excavations in 1995. Also from a mid-18th-century context, it has four bead impressions in a line on the rim below the bowl lip, but the glass beads are no longer present. Both sherds are tempered with finely crushed shell and are – apart from the bead inlays – typical of bowl rims in the site's early to mid-18th-century Native American pottery assemblage. These pots are thought to have been produced by the local Pascagoula Indians (by then coalesced with Capinans and Biloxis), who occupied villages a few miles north of the La Pointe-Krebs plantation between its establishment in 1717 until the Pascagoulas' withdrawal from the region in 1763 (Brain et al. 2004:593; Goddard et al. 2004:185; Waselkov and Gums 2000:25-26).

Both vessels have glass beads placed in a circumferential line just below the rim. The bowl sherd with beads still in place also has four beads arranged in a diamond pattern below the line. That combination of design elements (diamonds below a circumferential line near the rim) is similar, though not identical, to the pattern of in-filled triangles suspended from a circumferential line seen on Doctor Lake Incised pottery, the predominant type made by the Pascagoulas in the early 18th century (Gums and Waselkov 2015:59-64). Our interpretation of this motif delineated in glass beads on one small ceramic fragment was strengthened by the discovery of a description and sketch of an almost identical potsherd found in 1931 at the Martin's Bluff site, one of the Pascagoula village sites north of the La Pointe-Krebs plantation (Figure 7). According to handwritten notes jotted down a few years after the find by Schuyler Poitevent, Sr., a prolific avocational archaeologist:

> "It was here on this second trip [to Martin's Bluff on the Pascagoula River], August 25, 1931, that Junior found in the mud at the water's edge the pearl-studded piece of pottery no. 3145.... Piece of pottery studded around the rim with five white pearls, and with three more in the form of a diamond, the top or fourth pearl having fallen out.... I am going to use it for the title of my book 'Pearls in Pottery'" (Poitevent 1924-1940).

The elder Poitevent never published "Pearls in Pottery," nor evidently did he realize he had found a rare piece of Native American pottery studded with glass beads.

These independent discoveries of nearly identical potsherds inlaid with glass beads at the Martin's Bluff and La Pointe-Krebs plantation sites help us confirm the Native-made origin of the ceramics, something that was already strongly indicated by the sherds' other attributes (temper, vessel form, construction method, and decorative motif). We considered the possibility that these unusual pottery artifacts were made by enslaved Africans living on the plantation (Gums and Waselkov 2015:60-61, 154), but our literature review has failed to locate any references to pottery inlaid with glass beads made in colonial-era Africa, only bead-impressed examples (Pikirayi and Lindahl 2013:461-462). We, therefore, feel confident in identifying the potters as Pascagoula Indians, or one of the other Native peoples who had coalesced with the Pascagoulas by the early 18th century.

Yet another cluster of potsherds inlaid with glass beads has come to our attention. Excavations in 1993 by Louis Allaire (1994) at the Argyle site on the Caribbean island of St. Vincent in the southern Lesser Antilles uncovered "a unique Cayo potsherd with a series of glass beads inlaid

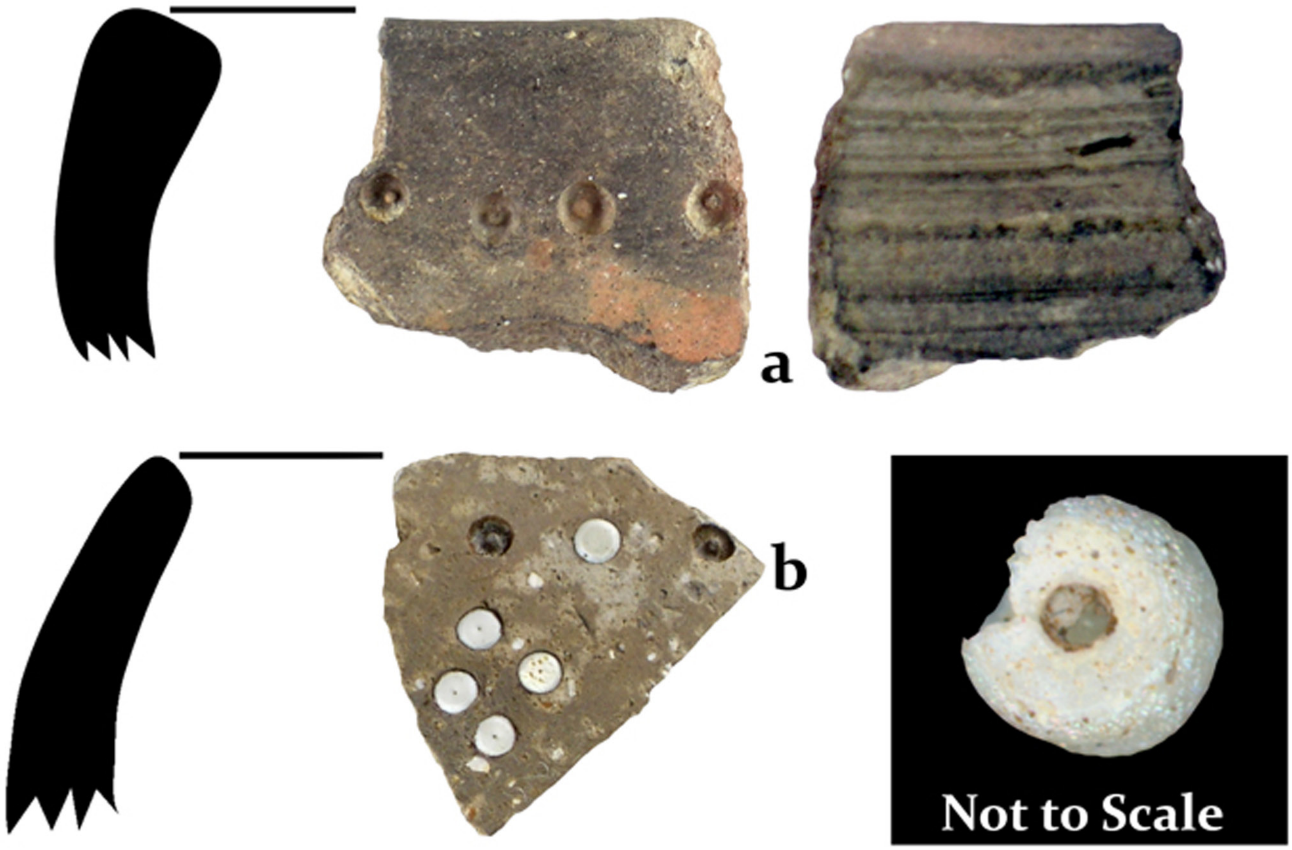
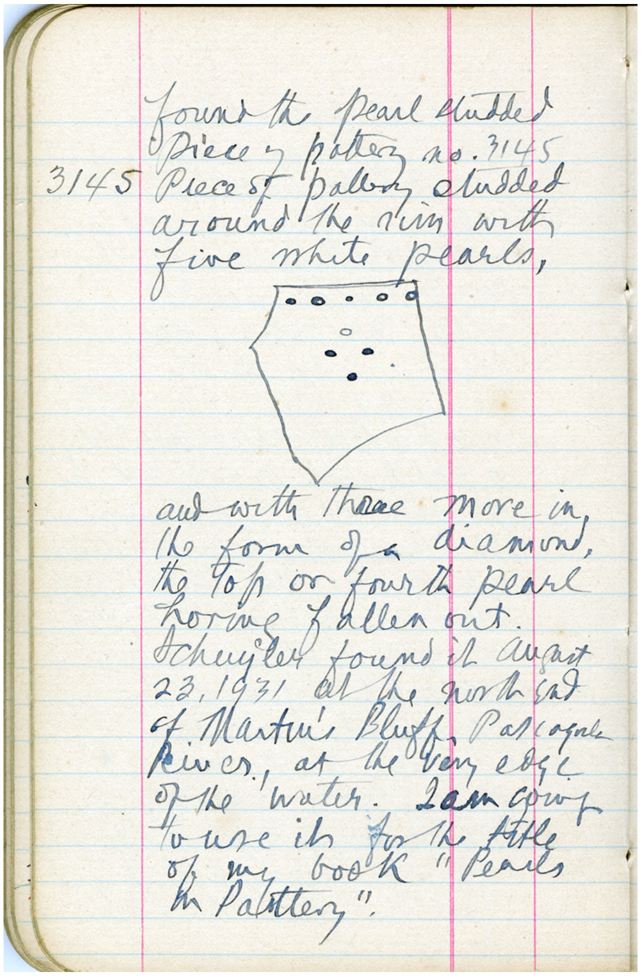


Figure 6. Two pottery bowl sherds from the LaPointe-Krebs plantation site in Pascagoula, Mississippi, inlaid with white glass seed beads: a) two images of exterior (left) and interior bowl rim sherd (2.3 cm wide) with impressions where inlaid beads have fallen out; b) sherd (2.0 cm wide) with some beads still in place on bowl exterior. The inset shows a seed bead that was inlaid in pottery but has since fallen out, showing the hole closed by heat, presumably during pottery firing (courtesy of the Historic Preservation Division, Mississippi Department of Archives and History, Jackson).

on the rim" (Boomert 2011:293). A second, very similar beveled rim of a Cayo "Form 2" open bowl with inlaid glass beads was recovered during further excavations at the Argyle site in 2010, although a report on that follow-up work has not yet been published (Boomert 2011:300). Both groups of excavators consider Cayo wares to be pottery made locally by the Island Carib inhabitants of St. Vincent during the 17th century.

One final ceramic artifact inlaid with glass beads deserves mention. Karlis Karklins (1992:69, 73) illustrates a vase-shaped ceramic smoking pipe from the Huntoon site in western New York state, a Seneca village occupied from 1710 to about 1745 (Figure 8). This pipe, like the pottery bowls described above, has a row of white glass seed beads imbedded in the upper rim. Considering the vase shape of the pipe bowl (a container homologous in some ways with a pottery vessel), we think it was treated symbolically as if it was a pot. Or, rather, its orifice was treated (literally or metaphorically) as the mouth of a pot.

This survey of colonial-era Native North American ceramic vessels inlaid with glass beads has revealed a handful of specimens from three sites in the northern Great Plains attributed to the Arikaras and Cheyenne, two sites near the Gulf coast in Mississippi with pottery attributed to the Pascagoulas (or associated groups), one site on the island of St. Vincent occupied by Island Caribs, and one Seneca site in western New York state, all datable to the 17th or 18th century. Given the huge geographical distances separating these four artifact clusters and their apparent lack of precise contemporaneity, we have no reason to suppose these artifacts belong to a single cultural tradition or style horizon. Yet there are a number of remarkable similarities between these ceramics inlaid with glass beads: 1) all of the beads consist of opaque white glass (Green et al. 2015); 2) all of the beads are of drawn manufacture and nearly all (except for two tubular beads on the handle from the Cheyenne River site) are small round forms, mostly falling in the "seed bead" size category; 3) nearly all of the beads (again except for the two tubular specimens) are inlaid flat,



found the pearl studded
piece of pottery no. 3145
3145 Piece of pottery studded
around the rim with
five white pearls,

and with three more in
the form of a diamond,
the top or fourth pearl
having fallen out.
Schuyler found it August
23, 1931 at the north end
of Martin's Bluff, Pascagoula
River, at the very edge
of the water. I am going
to use it for the title
of my book "Pearls
in Pottery".

Figure 7. Sketch of a "pearl studded piece of pottery" found in 1931 at the Martin's Bluff site near Pascagoula, Mississippi, by Schuyler Poitevent (1924-1940) (courtesy of the Mississippi Department of Archives and History, Jackson).

Figure 8. Vasiform ceramic smoking pipe of Seneca origin with inlaid glass beads from the Huntoon site (RF 6240/159) (on loan to the Rochester Museum & Science Center, courtesy of the Rock Foundation).

with holes revealed, with some space between beads, not aligned side-by-side; and 4) most of the specimens have their white seed beads arrayed in a single row running circumferentially around the vessel opening, either on the lip or on the upper rim, just below the lip (Table 1).

Granted the very small sample sizes we have at hand, these similarities across a huge geographical area are all the more remarkable. What could account for this near homogeneity in bead color, size selection, and placement on pots (and one pot-shaped smoking pipe) from a wide range of Native American contexts? We suspect several processes are at play. First of all, Schuyler Poitevent may not have been far off when he identified the heat-altered beads on his sherd from Martin's Bluff as pearls. The native predecessors to glass beads all over North America and the Caribbean were made from marine shell, which opaque white glass closely resembles. As discussed earlier in regard to glass used in effigy pipes to represent eyes, the introduction of a new material permitted creative new expressions of ancient symbolic values. Although the specific meanings expressed by the use of glass beads on ceramics certainly must have varied among the diverse ethnic groups represented in our sample, those meanings almost certainly derived from earlier meanings associated with shell beads.

Native North American folklore includes a myth that helps us understand how a fairly homogeneous category of shell artifacts came to share a similar social meaning across a diverse range of societies. The Bead Spitter myth, as detailed by John Swanton (1929:2-7) and George Lankford (2007a:107-113, 2011a:190-208), spanned most of North America, with versions known from more than two dozen different peoples during the 18th and 19th centuries. As the opening episode of many other more elaborate myths, it relates the story of a competition between two figures, one of whom had the ability to spit up supernaturally powerful shell beads. According to Lankford (2007a:110, 112), "while it seems a whimsical motif today, shell-spitting

Table 1. Archaeological Contexts of Ceramic Artifacts Inlaid with Glass Beads.

Site (Ethnic Attribution)	Date Range	Location
	Pottery Sherds	
Biesterfeldt (Cheyenne)	1720-1780	North Dakota
Fort Clark (Arikara/*Sáhniš*)	1837-1861	North Dakota
Cheyenne River (Arikara/*Sáhniš*)	1735-1775	South Dakota
La Pointe-Krebs (Pascagoula)	1717-1763	Mississippi
Martin's Bluff (Pascagoula)	1700-1763	Mississippi
Argyle (Island Carib)	1600s	St. Vincent and the Grenadines
	Smoking Pipes	
Huntoon (Seneca Iroquois)	1710-1745	New York
Ocmulgee (Creek)	1690-1716	Georgia
Dann (Seneca Iroquois)	ca. 1655-1675	New York

was a well-known ritual practice." Around A.D. 1300, Central Algonquin- and Siouan-speaking shamans in the upper Mississippi/Great Lakes area formed the Midewiwin medicine society which incorporated a lodge structure, medicine bags, shell beads that were ritually shot... and the tale of the Bead Spitter (Lankford 2016). Over time the medicine society, its material correlates, and the myth spread as far south as the Muskogean-speaking Mississippian peoples of modern-day Alabama and Georgia, all the while crossing major cultural, linguistic, and geographical boundaries. The appearance of a consistent symbolic grammar revealed to us by pottery vessels and smoking pipes inlaid with glass beads may have developed in a similar fashion across time, culture, and space.

Green et al. (2015) astutely note the resemblance of a row of white glass beads arrayed on the rim of a pot to the strands of beads – first shell, then glass – that adorned Native peoples of the Americas in the pre-contact and colonial eras. Pots and pot-shaped pipes may well have been personified and ornamented as persons should be, by their makers. Despite the proverbial warning, "pots are not people" (Kramer 1977), aimed at archaeologists who may be tempted to read ethnic identity from styles of pots, in this case they may well have been viewed as such!

There may be another reason why certain pots and smoking pipes were decorated with symbolic strands of glass beads. Recent research on the Mississippian iconography of eastern North America has revealed the tendency for pottery to be decorated with designs indicating the various realms of the cosmos. We now know that a great many pots made in the Mississippian Southeast carry symbols of the Above World, Middle World, and Beneath World (Lankford 2004, 2007b, 2011b; Pauketat and Emerson 1991). So widespread was this decorative tradition that one prominent iconologist, George Lankford, has concluded that most pottery functioned as microcosms, earthen representations of the worldview of the potters (Lankford 2004:209). The repetitive geometrical patterns found on pots made in northeastern North America, in the Great Plains, and in the eastern Caribbean very likely represent similar cosmological beliefs. Encircling a ceramic depiction of the Above World with a row of luminous white glass beads might have seemed perfectly appropriate from that cultural perspective.

CONCLUSIONS

Our intentions with this article were to 1) raise awareness of the potential for historic native-made ceramics with glass bead inlays, and thereby encourage others to reexamine curated collections for examples of the genre, and 2) consider the meanings such artifacts held in their original historical and cultural contexts of manufacture and use. In terms of our first objective, we believe it is entirely possible that bead-decorated pottery has been overlooked in many artifact collections. It would be easy to do so because of the rarity of this class of material culture and lab personnel's consequent unfamiliarity in identifying it. In the cases outlined here, on three different occasions ceramics inlaid with glass beads were initially misidentified while processing potsherds from the La Pointe-Krebs site; when an avocational archaeologist mistook glass beads for pearls; and when glass beads inlaid in a pipe were either overlooked or unremarked upon when processing artifacts from Ocmulgee. The possibility is exponentially higher for overlooking or misidentifying pottery where only bead impressions remain, and not the beads themselves. We suspect that beads impressed end-on into the clay, with the hole showing, may be especially underrepresented as their impressions resemble punctations made using cane, bone, or other hollow materials with the same cross-section shape. Only the discovery of sherds still bearing glass bead inlay in a collection will likely spark recognition by the average archaeologist of empty impressions once occupied by beads.

It is worth our effort to remain watchful for these relatively rare specimens, for they bear much information and are not simply rare because they reflect a potter's whimsy. The consistent pattern of inlaid bead arrangement and color in ceramic media, particularly vessels and pipe bowls, suggests that their rarity is at least partly a reflection of the restrictions of the "grammar" in which symbols were used to communicate a particular ideological metaphor. We recognize significance in material patterns that may help us more fully comprehend the metaphor they represent; e.g., that white beads like those described above were appropriate for encircling, perhaps personifying, the openings of vessels. The singular pipe from the Huntoon Seneca site may be the exception that proves the rule, for while it is not a pot, it appears to follow the rules of the symbolic grammar in the resemblance of the pipe bowl form to that of a pottery vessel. To the people who made and used the pipe, this visual "pun" may have made it suitable for adornment by inlaying white beads around its circumference. The other pipes from Dann and Ocmulgee, by contrast, have beads inlaid only as eyes. While the colors of these beads vary, none are white, and thus may represent another rule of the symbolic grammar, one perhaps connoting supernatural sight whose realm of meaning is different from, or in opposition to, the meanings conveyed by the use of the color white.

So how is it that these two pipes, and the several bowls, came to share the same symbolic grammar, despite their use by individuals of different cultures, speaking different languages, and separated by great distance? We too often think of colonial America as a place where long-distance travel and communication were slow and difficult. Certainly the pace of life then was far slower than today, but that is hardly a fair comparison, considering how much technology has changed over the last three centuries. Given available modes of conveyance, whether on foot or horseback or by canoe or sailing ship, people and information could manage with time to traverse great distances. Historians, however, seem more willing to accept that notion when discussing European colonial travel and communication, for which there is written evidence in the form of letters, diaries, and newspaper accounts, than when considering the movement of American Indians across the landscape. In the absence of a colonial observer who happened to jot down mention of a visiting delegation of distant native peoples or record news credited to native sources, the tendency has always been to assume that such events were rare occurrences. While admittedly we still have much to learn about the interconnectedness of Native North America during the colonial period, artifacts like the ceramics inlaid with glass beads from the nine discussed sites help us see beyond the limited gaze of colonial writers.

Consider the smoking pipes with inlaid eyes, for example. We need not presume that a face-to-face meeting occurred between the smokers of these two pipes, from two societies widely separated geographically but roughly contemporary, to see that they nevertheless shared related worldviews developed over centuries of intercommunication involving mutually intelligible symbolic metaphors. The stylistic similarities of a Seneca pipe from the eastern Great Lakes, a Creek pipe from the Deep South, and head pots from the central Mississippi valley help us see a few of the links in a communications network that spanned the continent, with no perceptible assistance from literate colonists apart from providing supplies of glass beads. Because we know that smoking pipes, in particular, played key roles in ceremonies that encouraged dialog and negotiations between societies, they are particularly suited for revealing the interconnectedness of ancient Native Americans (Sempowski 2004; Wonderly 2005). Our two pipes with inlaid glass beads for eyes from far-flung parts of eastern North America stand as witnesses that American Indians of the colonial era spoke to each other and communicated routinely across great distances, a fact too often discounted as implausible. Their unusual symbolism further reminds us that the worldviews of colonists differed radically from those of Native Americans.

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A 17TH-CENTURY GLASS BEAD FACTORY AT HAMMERSMITH EMBANKMENT, LONDON, ENGLAND

Karlis Karklins, Laure Dussubieux, and Ron G.V. Hancock

Excavations in 2001 and 2005 at Hammersmith Embankment in West London uncovered the remains of two glass furnaces with associated wasters relating to the manufacture of drawn glass beads during the second quarter of the 17th century. The site is significant as it represents the first archaeological evidence for the production of glass beads in post-medieval England. A preliminary study of the recovered material reveals the presence of 43 different bead varieties, many with stripes and multiple layers. While a number have not yet been observed elsewhere, a few have correlatives at a contemporary bead production site in Amsterdam, as well as aboriginal sites in northeastern North America. Comparisons of the chemical compositions of the Hammersmith beads with those of beads from the Amsterdam factory and other loci reveal a number of similarities as well as differences indicating that it will be difficult to identify Hammersmith beads at other sites around the world.

INTRODUCTION

A number of European nations are known to have manufactured glass beads during the post-medieval period but until recently, England was not among them. This all changed when the Museum of London Archaeology (MOLA) conducted excavations at Hammersmith Embankment, a parcel of land on the east bank of the Thames in the Borough of Hammersmith and Fulham, West London, which was to be developed as an office complex. Conducted in 2001 and 2005, the archaeological investigations revealed the remains of two brick furnaces with glass-encrusted crucible fragments and a large quantity of beadmaking wasters in association. Historical documentation and the recovered artifacts reveal that a glassworks for the manufacture of drawn glass beads had stood here during the second quarter of the 17th century. This is a very significant find as it represents the first recorded evidence for the manufacture of glass beads in England during the post-medieval period (Jamieson 2007:7-8).

What is now known as Hammersmith Embankment was the former site of Brandenburgh House, the private estate of Sir Nicholas Crisp (1598-1666), a wealthy London merchant (Figure 1) who was deeply involved in the West African trade. His involvement with the Company of Adventurers of London, better known as The Guinea Company, began

Figure 1. Sir Nicholas Crisp (published in 1795 by Cadell and Davies, London).

in 1625; three years later Crisp owned a controlling interest in the company. In 1631, he and his partners were granted monopolies to conduct trade on the west coast of Africa from Cape Blanco (at the border between what is now Mauritania and Western Sahara) and the Cape of Good Hope. The company principally traded in ivory, hides, gold, redwood (for dyes), and slaves. Beads appear to have been an important commodity in this trade and around 1635, Crisp was granted a patent for "the making and vending of Glass beads and Beugles" (Jamieson 2007:8). Unfortunately, this endeavor was short lived as Parliament forced him to surrender these monopolies in 1640 (Jamieson 2006:11). Nonetheless, Crisp continued to be involved in the African trade for many years thereafter, but it is unknown if the production of beads at Hammersmith was ever revived.

THE HAMMERSMITH EMBANKMENT BEADS

While a full report on the archaeological findings at Hammersmith Embankment has not been published as yet, color images of some of the recovered beads and production tubes appeared in several short printed and Internet articles on the site (e.g., Jamieson 2007; Moss 2007). The beads (Figure 2) appeared to be very similar to specimens encountered in early-17th-century beadmaking wasters excavated in Amsterdam (Karklins 1985) and at several contemporary aboriginal sites in eastern North America. In hopes that an examination of the Hammersmith material might help differentiate beads produced in London from those manufactured in Holland and elsewhere, Karklins obtained permission to examine the collection over a two-day period in January of 2013 while in England to attend an archaeological conference. Although it was possible to examine all the recovered bead-related material, time constraints did not permit a quantitative study of the collection. It was, however, possible to determine that there were at least 43 varieties of drawn glass beads in the collection (Figure 3). These are described using an expanded version (Karklins 2012) of the classification system developed by Kenneth and Martha Kidd (1970). Varieties not represented in the Kidd's system are designated by an asterisk (*) with a sequential letter for ease of reference. Dimensions are in millimeters. D = Diameter; L = Length.

Figure 2. An assortment of production tubes and rejected beads from the Hammersmith Embankment excavations (courtesy of Museum of London Archaeology).

Ia2. Tubular; op. black. D: 1.7-12.6; L: 22.8-82.0.

Ia3. Tubular; tsp. light gray (colorless). D: 3.2; L: 26.0.

Ia18/19. Tubular; tsp. ultramarine to bright navy. D: 2.9-13.3; L: 26.4-58.3.

Ia21. Tubular; tsp. rose wine. D: 1.8-4.8; L: 18.6-42.0.

Ib*(a). Tubular; op. barn red with 8 op. white stripes. D: 20.3; L: 62.0.

Ibb*(a). Tubular; op. redwood with 4 op. black-on-white stripes. D: 11.5-12.7; L: 14.4-20.0.

Ibb*(b). Tubular; op. redwood with 4 tsp. ultramarine-on-white stripes. D: 12.4; L: 11.6-19.7.

Ibb*(c). Tubular; op. barn red with 8 op. black-on-white stripes. D: 13.2; L: 19.0.

Ibb*(d). Tubular; tsl. bright navy with 6 or 8 (likely) op. barn red-on-white stripes. D: 19.0+; L: 25.0.

Ic*(a). Tubular (square cross-section); tsp./tsl. bright navy. D: 13.5-13.8; L: 72.8.

IIa2. Circular; op. barn red. D: 3.0; L: 2.0.

IIa7. Circular; op. black. Many specimens are fused together. D: 3.3-6.1; L: 2.9-4.3.

IIa12. Circular; tsl. oyster white; flashed in clear glass. D: 2.7-3.7; L: 1.7-2.7.

IIa*(a). Circular; tsp. mustard gold. D: 3.2-6.8; L: 1.6-3.5.

IIa55. Barrel shaped; tsp. bright navy. D: 2.9; L: 6.3.

IIa56. Circular; tsp. bright navy. Many specimens are fused together. D: 2.4-5.7; L: 1.3-7.0.

IIa59. Circular; tsp. rose wine. D: 3.4-5.1; L: 2.5-3.6.

IIb*(a). Circular/globular; tsp. light gray with 6 op. internal white stripes ("gooseberry"). D: 3.0-3.2; L: 2.5.

Figure 3. The Hammersmith Embankment bead varieties; Ibb*(d), IIa12, and IVb*(c) are not illustrated (photos: Karlis Karklins).

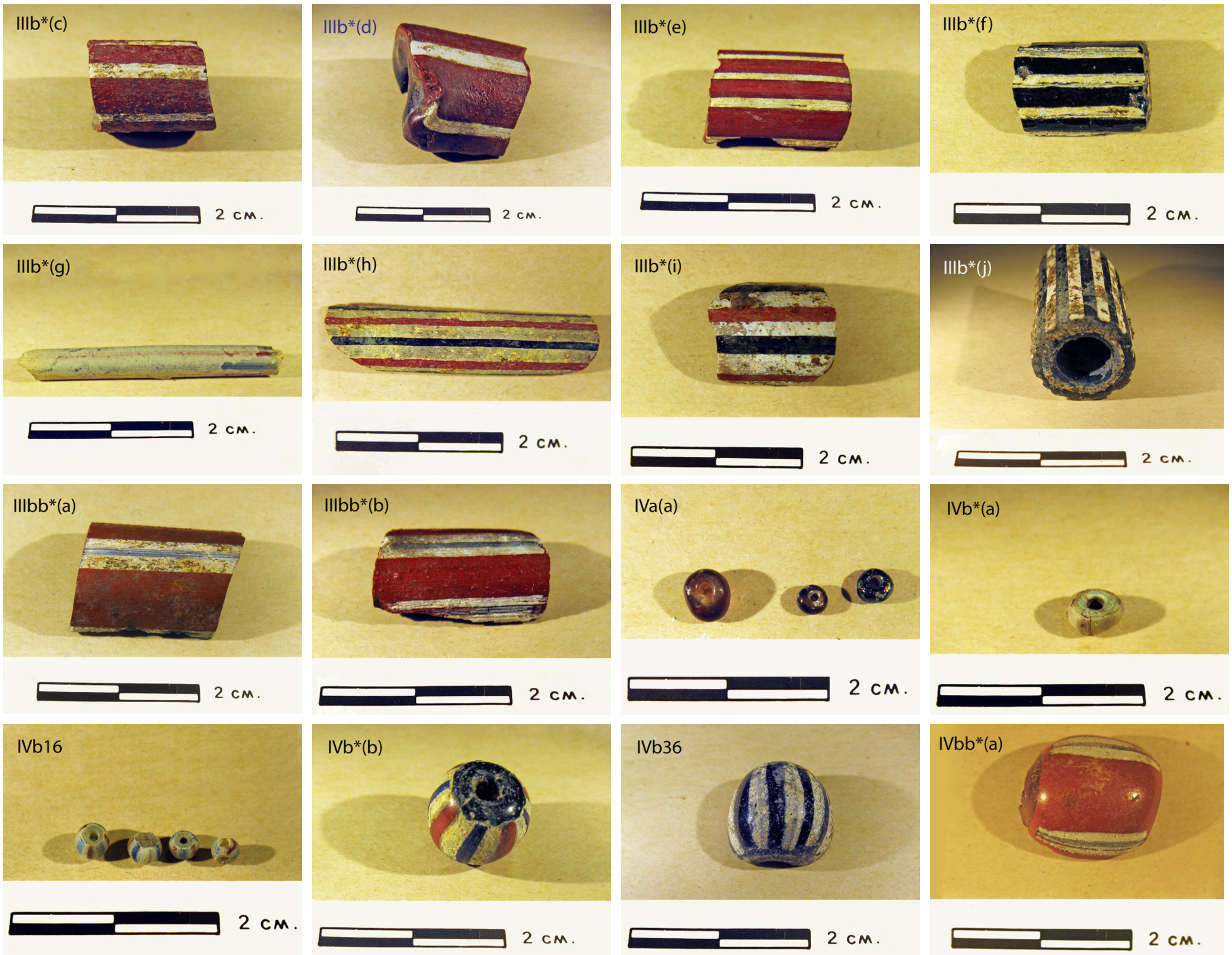

Figure 3, continued. The Hammersmith Embankment bead varieties.

IIbb3. Globular to barrel shaped; op. barn red with 4 tsp. ultramarine-on-white stripes. D: 14.8-19.5; L: 14.1-16.7.

IIbb'*(a). Globular; op. barn red with 4 tsp. ultramarine-on-white spiral stripes (the spiral nature may be due to deformation during the rounding process). D: 17.4; L: 16.3.

IIIa3. Tubular; op. barn red exterior/ tsp. green core. D: 2.1; L: 5.4.

IIIa7. Tubular; tsp. light gray exterior/ op. white middle layer/ tsp. light gray core. D: 5.9; L: 93.5.

IIIa*(a). Tubular; tsp. bright navy exterior/ op. white middle layer/ op. barn red core. D: 7.3; L: 81.5.

IIIa*(b). Tubular; tsp. rose wine exterior/ tsp. light gray core. D: 3.6-3.8; L: 34.1.

IIIb*(a). Tubular; op. barn red exterior with 8 op. white stripes/ op. taupe brown core. D: 10.4-15.0; L: 15.1-21.7.

IIIb*(b). Tubular; op. barn red exterior with 8(?) op. white stripes/ tsp. aqua blue core. D: 17.3; L: 42.5.

IIIb*(c). Tubular; op. barn red exterior with 7 op. white stripes/ op. white middle layer/ op. taupe brown core. The middle layer has a distinct bluish tint on one specimen. D: 11.6-12.9; L: 15.6-25.2.

IIIb*(d). Tubular; op. barn red exterior with 6 or 8 op. white stripes/ op. white middle layer/ op. barn red core. D: 22.0; L: 23.0.

IIIb*(e). Tubular; op. barn red exterior with 12 op. white stripes/ op. white middle layer/ op. barn red core. D: 10.6-11.4; L: 15.1-21.0.

IIIb*(f). Tubular; op. black exterior with 12 op. white stripes/ op. white middle layer/ op. barn red core. D: 11.1-19.5; L: 17.0-26.0.

IIIb*(g). Tubular; tsp. light gray exterior/ op. white middle layer with 3 op. barn red and 3 tsp. bright navy stripes/ tsl. pale blue core. D: 4.7; L: 33.6.

IIIb*(h). Tubular; op. white exterior with 6(?) op. redwood and 6(?) op. black stripes/ op. barn red core. D: 7.9; L: 31.3.

IIIb*(i). Tubular; op. white exterior with 4 op. redwood and 4 op. black stripes/ op. redwood layer/ op. white layer/ op. barn red core. D: 12.0; L: 13.5.

IIIb*(j). Tubular; tsp. bright navy exterior with 10-12 op. white stripes/ op. white middle layer/ tsp. bright navy to ultramarine core. D: 9.3-12.7; L: 8.0-32.7.

IIIbb*(a). Tubular; op. barn red exterior with 4 tsp. ultramarine-on-white stripes/ tsp. light gray core. D: 14.0; L: 22.2.

IIIbb*(b). Tubular; op. barn red exterior with 4 tsp. ultramarine-on-white stripes/ tsp. aqua blue core. D: 11.9-12.1; L: 18.6-19.5.

IVa*(a). Circular; tsp. rose wine exterior/ tsp. light gray core. D: 2.4-4.4; L: 2.4-3.5.

IVb*(a). Circular; tsp. light gray exterior/ op. white middle layer with 6 op. barn red stripes/ tsp. light gray (bluish tint) core. D: 4.9; L: 3.2.

IVb16. Circular; tsp. light gray exterior/ op. white middle layer with 3 op. barn red and 3 tsp. bright navy stripes/ tsl. pale blue core. D: 3.5; L: 2.0.

IVb*(b). Globular; op. white exterior with 5 op. barn red and 5 op. black stripes/ tsp. bright blue core. D: 11.7; L: 11.5.

IVb*(c). Globular; op. white exterior with 4 op. barn red and 4 tsp. navy blue stripes/ op. barn red layer/ op. white layer/ op. barn red core. D: 13.0+; L: 10.0+.

IVb36. Globular to barrel shaped; tsp. bright navy to dark navy exterior with 10-12 op. white stripes/ op. white middle layer/ tsp. bright navy to ultramarine core. D: 10.4-14.7; L: 8.0-15.0.

IVbb*(a). Globular to barrel shaped; op. barn red with 4 tsp. ultramarine-on-white stripes/ op. taupe brown core. D: 12.5-14.0; L: 14.0.

COMPARISONS

To determine if the Dutch were producing similar beads, the Hammersmith assemblage was compared to beadmaking wasters from site Asd-Kg10 in Amsterdam (Karklins 1984). Originally believed to have been deposited between 1590 and 1610 (Karklins 1985:37), the wasters have recently been attributed to the first Two Roses glasshouse which operated on the Keizersgracht from 1621 to 1657 (Hulst 2012; James Bradley 2015: pers. comm.). Of the 43 Hammersmith varieties, 20 had correlatives in the wasters, 13 among the undecorated beads and 7 among the striped varieties. An additional 5 varieties resembled Hammersmith beads but differed either in shape, the number of stripes, or core color.[1]

That roughly 50% of the Hammersmith varieties are represented in the Dutch wasters is not surprising as it is likely that the Hammersmith beadmaking concern was established with the help of an expatriate Venetian as was the case with the Dutch industry (Baart 1988). It may even have been someone from the Dutch beadmaking industry. In any case, the recipes, techniques, and styles would therefore be essentially the same for all three manufacturing centers. It does, however, appear that some experimentation went on at Hammersmith and some unique varieties were produced there.

The Hammersmith assemblage was then compared to beads excavated at several early to mid-17th-century aboriginal sites in eastern North America to see if there might be similar varieties there. A number of correlatives were found, especially in the former Iroquois territory of New York state, a region under Dutch control at that time. An examination of the bead inventories of several sites in the Mohawk region of east-central New York state that were occupied between 1615 and 1646 (Rumrill 1991) revealed 8 undecorated correlatives and 6 striped ones, with an additional 7 striped varieties being similar to Hammersmith varieties.[2] A similar number of correlatives were found further west in Seneca territory at the Dutch Hollow and Factory Hollow village sites which were inhabited from 1605 to 1625 (Sempowski and Saunders 2001). Here the count was 7 undecorated correlatives, 9 striped ones, and 3 similar varieties.[3] Aside from some undecorated seed bead varieties, few correlatives were encountered elsewhere, especially among the striped multi-layered specimens that distinguish the Hammersmith assemblage.[4]

Finding correlatives in 17th-century West African bead assemblages has so far been hampered by a lack of well-dated bead collections of that period, and generally poor descriptions of the beads, especially in early reports, that make comparative studies difficult. It is hoped that this article will result in researchers identifying possible correlatives in their African bead collections.

HAMMERSMITH BEAD CHEMISTRIES

In an attempt to differentiate the beads produced at Hammersmith Embankment from like beads found elsewhere in the world, 70 glass samples representing the more numerous bead varieties at the site were investigated by Ron Hancock of P. & R. Hancock Consulting Services Inc., Toronto, Ontario, using instrumental neutron activation analysis (INAA) at the McMaster Nuclear Reactor in Hamilton, Ontario (Hancock 2013). This revealed that the beads were all composed of soda-lime-silica glass with compositions generally compatible with glass beads found at sites in northeastern North American dating to before the end of the first half of the 17th century. Determination of the exact composition of the different colored glasses was, however, hampered by the multi-colored nature of many of the submitted samples since neutron activation analysis lumps the compositions of all the different glasses together.

To establish a better compositional description of the glasses, 37 of the samples, along with 20 specimens of bead wasters from site Kg10 in Amsterdam, were subsequently analyzed by Laure Dussubieux of the Elemental Analysis Facility, The Field Museum, Chicago, using laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) which can pinpoint specific glasses on multi-colored specimens. Her analysis confirmed that the specimens from London were all composed of soda-lime glass produced using halophytic (salt-tolerant) plant ash as a flux. Furthermore, four groups could be differentiated based on the concentrations of the constituents (Dussubieux and Karklins 2015).

Group 1 is the most populous and includes beads representing all recorded colors except purple. It has an average soda concentration of 13.6% and an average lime concentration of 11.1%. Group 2 is characterized by lower lime (7.8% average) and higher soda (15.6% average) concentrations. This group incorporates dark blue beads and one purple bead. Represented by five purple beads, Group 3 has the highest soda (18.5% average) concentrations but also the lowest lime (5.6% average) content. It also has the lowest manganese (1.9% average) and the highest potash (3.6% average) concentrations. Group 4 has low soda (9% average) concentrations but lime concentrations are fairly similar to those in Group 1. This group has the highest alumina (3.5% average) concentrations. It is represented by one dark blue and two white specimens.

Comparison of glass Groups 1, 2, and 3 reveals that the soda concentrations in these glasses are higher while the concentrations of lime and manganese are lower. This may be due to the use of different types of soda plant ash or the use of ash with different degrees of purity.

The variation of trace element concentrations for such elements as zirconium and niobium, two elements believed to be associated with the sand used to produce the glass, exhibits different trends with a correlation for Groups 4 and 1 distinct from that of Groups 2 and 3. This suggests the use of at least two types of sand containing different types of minerals. (For full details of the analysis, *see* Dussubieux and Karklins 2015.)

AMSTERDAM BEAD CHEMISTRIES

All but three of the beads from Kg10 in Amsterdam are composed of soda-lime glass. The exceptions are three opaque yellow beads. Two of these contain high concentrations of lead (72-73%), low levels of silica (23-24%), and significant concentrations of tin oxide (~2%). The third specimen has a very different composition with more silica, soda, lime, manganese, and alumina, but lower levels of lead.

The other beads seem to have soda and lime concentrations that vary in the same way as those of the London glass samples in Groups 1, 2, and 3. The identification of discrete groups is more difficult, however. There is no equivalent to London Group 4 in the Amsterdam sample.

Trace elements, especially zirconium and niobium, that were found useful in distinguishing different types of sand, correlate for most of the samples in a similar way as for London Group 1, but lower concentrations of both these elements suggest the use of a similar type of sand but from a different source.

The findings, combining major, minor, and trace elements, suggest that most of the Amsterdam glass samples were manufactured using very similar recipes compared to the glass used in London but the glasses found at the two sites were manufactured with different raw materials.

DISCUSSION

There is a certain intra-site heterogeneity in the compositions of the glass beads from both London and Amsterdam. This is apparent in the very singular composition of the yellow glass from Amsterdam that contains high concentrations of lead. Other glass samples have similar compositions but different coloring recipes. The color of the opaque red tubes from Amsterdam was obtained by mixing very different ingredients. This would make it unlikely that the glass was produced on-site even if it cannot be excluded that these variations in the coloring recipes were due to experimentation, testing, or constant improvement of the recipes. It is possible, more especially for the Hammersmith Embankment site, that the different colored glasses were procured from different sources elsewhere in Europe in the form of ingots, possibly even Venice.

Then there is the overlap of compositions between the two sites. A Group 3 glass bead is present in the London assemblage as well as in that from Amsterdam. Group 1 glass from London has a composition that overlaps with most of the compositions identified in Amsterdam even if it seems that lower zirconium and niobium concentrations are associated more specifically with Amsterdam. The high-trace-element Group 1, and the Group 2 and 4 compositions appear unique to London but the analysis of additional samples may alter this perception.

Comparing the Hammersmith glass compositions to those of glass beads recovered from contemporary sites in northeastern North America reveals similarities as well as differences. Tin is present in the Hammersmith white glass samples in significant quantities (4.5-21.5%). This is compatible with glass beads found at sites in the Northeast that were occupied before the end of the first half of the 17th century (Hancock et al. 1997; Sempowski et al. 2000). The Group 2 dark blue beads from Hammersmith colored with cobalt are similar, but not identical, to cobalt-rich beads recovered from the Grimsby (ca. 1625-1639?) and Ossossane (ca. 1636?) sites in southern Ontario. There are also similarities with red beads from archaeological sites in Ontario and New York state but no exact matches (Sempowski et al. 2001). Turning to the purple (rose wine) beads, there are no similarities with North American specimens but this is based on only two samples so this is hardly conclusive (Hancock 2013).

The similarities and differences in the compositions of the glass beads from London, Amsterdam, and northeastern North America reveal that identifying beads produced in London in other parts of the world will be challenging but may be possible in some cases.

CONCLUSION

The glass bead business at Hammersmith Embankment was initiated by Sir Nicholas Crisp to supply these colorful baubles for the West African trade. If historical documents are correct, the factory only functioned for about five years, from 1635 to 1640. It is unknown how prolific the concern was but it produced at least 43 different varieties.

Based on the recovered material, the principal products were undecorated beads of various colors and sizes, and generally large to very large striped beads with one or more layers. Body colors included red, dark blue, white, gray (colorless), black, purple, and gold (deep yellow) with the first three being employed for the bulk of the varieties with gold being restricted to one variety. Stripe colors were limited to white, black, dark blue, and red. It still remains to be determined if the glass used to produce the beads was made on site or imported from elsewhere.

Varieties visually similar to the Hammersmith beads were noted at contemporary Iroquois sites in New York state. Do these similarities intimate that beads manufactured at Hammersmith Embankment reached a part of North America that was dominated by Dutch traders? This is highly improbable and the likelihood is that both Crisp and the Dutch (and likely the Venetians as well) were producing similar types of beads using similar recipes but ingredients from different sources. It is, however, possible that some Hammersmith beads made it to the southeastern United States or the Caribbean via African slaves or as surplus cargo unloaded on this side of the Atlantic. It will be interesting to see if any of the distinctive Hammersmith striped and multi-layered varieties are eventually found in either region. Chemical analysis may then be able to indicate which beadmaking center they originated from.

There is still very much to be learned about Crisp's bead business and its products. It is hoped that continued research will reveal more details, and that funding will soon be forthcoming so that the full archaeological report on this significant English beadmaking site may be published by MOLA and distributed.

ENDNOTES

1. The Amsterdam correlatives include undecorated varieties Ia2, Ia3, Ia18/19, Ia21, Ic*(a), IIa2, IIa7, IIa12, IIa55, IIa56, IIa59, IIIa3, and IIIa7; striped varieties Ib*(a), Ibb*(b), IIbb3, IIIb*(g), IIIb*(j), IVb*(a), and IVb16; and similar varieties IIa*(a), IIb*(a), IIbb'*(a), IIIb*(h), and IVb36. It should be mentioned that since Hammersmith Embankment is a bead production site, for comparative purposes, the tubular varieties were considered to be both beads and production tubes for heat-rounded beads. Consequently, heat-rounded Amsterdam varieties were considered as correlatives to their tubular counterparts in the Hammersmith assemblage.

2. The Mohawk site correlatives include undecorated varieties Ia2, Ia19, IIa2, IIa7, IIa55, IIa56, IIIa3, and IIIa7; striped varieties Ib*(a), Ibb*(b), IIbb3, IIIb*(g),

IVb16, and IVb36; and similar striped varieties IIb*(a), IIIb*(j), IIIbb*(a), IIIbb*(b), IVb*(a), IVb*(b), and Ivbb*(a).

3. The Seneca site correlatives include undecorated varieties Ia2, Ia19, IIa2, IIa7, IIa55, IIa56, and IIa59; striped varieties Ibb*(d), IIbb3, IIIb*(b), IIIb*(g), IIIb*(j), IVb*(a), IVb16, IVb*(b), and IVb36; and similar varieties IIb*(a), IIIa3, and IIIa7.

4. The sites or site groupings that were checked include Bead Period III sites in Ontario, ca. 1615-1609 (Kenyon and Kenyon 1983), Susquehannock sites in Pennsylvania, 1600-1645 (Kent 1984), St. Catherines Island, Georgia, late 16th and 17th centuries (Blair, Pendleton, and Francis 2009), and Indian sites under English influence in the Southeast, 1607-1783 (Marcoux 2012).

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PIPECLAY BEADS FROM NORTON ST PHILIP, ENGLAND

Marek Lewcun

In 17th-century England, the village of Norton St Philip was well known as a center for the manufacture of clay tobacco pipes. In recent years, however, discoveries have shown that pipes were not the only things they made, as among a variety of interesting objects are some quite remarkable beads.

INTRODUCTION

Norton St Philip is a medium-sized village on the eastern edge of the county of Somerset, southwest England, and lies 15 miles (24 km) southeast of the port city of Bristol and 7 miles (11 km) south of the Roman city of Bath. At the time of the Domesday survey, commissioned by William the Conqueror in the year 1086, it supported 20 people with three plows, a mill, and 20 acres of meadow. In 1255, it was granted the right to hold a cloth fair, which gave the settlement the status of a town, and throughout the medieval period it was one of the most important fairs in England which attracted trade from far and wide. The fair declined in later years, and Norton St Philip was gradually reduced back to village status (Brett 2002).

At the center of the village is the magnificent timber-framed George Inn, created as a hostelry in the 14th century by the monks of the nearby Carthusian monastery (Brett 2007). In 1397, it was granted the earliest licence in the whole of England to sell alcohol. In June 1685, the march of the Monmouth Rebellion arrived in the village, which hosted the penultimate battle on English soil when James Duke of Monmouth fought royal forces in a bloody confrontation. Today the village has a population of 858, and the principal trades are agriculture (mixed arable and dairy) and tourism to the George Inn, the Fleur-de-Lis public house opposite it, and the High Street with its historic houses.

PIPECLAY BEADS

Sometime during the period 1620-1630, the Hunt family began making clay tobacco pipes. The clay used is pale grey prior to firing to a white color and was obtained from pits dug in the parish of Chitterne, in the neighboring county of Wiltshire. By 1650, the production of pipes, some of which found their way to North America, became the next largest local employer after agriculture and cloth, with products bearing the makers' names being sold up to 50 miles (80 km) away (Lewcun 2005).

The Norton St Philip pipe makers occasionally made other items such as wig curlers, decorated gaming pieces, and marbles. They also produced beads. To date, six beads have been found among kiln debris which was tipped in local fields along with many thousands of pipes which were broken or misfired in the workshop. From the pipes associated with them, the beads can be accurately dated to the period 1670-1700, and some, at least, were made by Jeffry Hunt, who died in May 1690.

Of the six beads (Figure 1), five are decorated. Of these, four are spherical, the fifth is in the form of a truncated cone, while the sixth, undecorated, is oval. The decoration consists primarily of stars, wheels, crosses, compound indentations, and rouletted lines. The diameter of the spherical beads ranges from 17.5 mm to 19.1 mm. The holes of the beads generally range from 2.2 mm to 3.5 mm (6/64-9/64 in.), typical of the borehole in pipes of the late 17th century in Somerset.

Bead 1 (Figure 2), found in the southern part of the village, is spherical with a diameter of 18.2 mm and a hole that is 2.9 mm wide. The decoration consists of a number of rouletted short lines, between which are several impressed design elements composed of two small indentations connected by a shallow groove.

Found in the western part of the village, Bead 2 (Figure 3) is sub-spherical and 17.5-19.1 mm in diameter with a hole that is 2.2-2.4 mm wide. It exhibits the same decoration as Bead 1, but with the addition of crosses formed by four short indentations in each case.

Bead 3 (Figure 4), from the northern part of the village, is incomplete but would have had similar dimensions to Beads 1 and 2. The hole is 2.2 mm in diameter. The decoration is

Figure 1. The six 17th-century pipeclay beads found among kiln debris at Norton St Philip, England. The oval bead is 26.3mm long (all photos by author).

Figure 2. Spherical pipeclay bead (no. 1) decorated with rouletted lines and indented elements (diameter: 18.2 mm).

Figure 3. Sub-spherical bead (no. 2) decorated like no. 1 with the addition of cross-like elements (diameter: max. 19.1 mm).

Figure 4. Fragmentary spherical bead (no. 3) decorated with rouletted lines (diameter: ca. 19.0 mm).

plainer, consisting solely of rouletted lines, two stretching from hole to hole and a single one around the middle. Bead 4 (Figure 5) is also spherical and has a diameter of 17.5 mm and a hole 2.8 mm wide. The decoration differs from the first three beads, there being an absence of any rouletted lines. Instead, it is covered with crude stars or asterisks impressed in the soft clay using a piece of pipestem into which notches had been cut.

Figure 5. Spherical bead (no. 4) decorated with crude stars or asterisks (diameter: 17.5 mm).

Beads 5 and 6 are the only ones of their style found so far. Bead 5 (Figure 6), from the southern part of the village, is in the form of a truncated cone 13.5 mm in length. The diameter ranges from 12.2 mm at one end to 15.3 mm at

Figure 6. Truncated-cone bead (no. 5) adorned with spoked-wheel designs (max. diameter: 15.3 mm).

the other, while the hole is 3.0-3.5 mm in diameter. The decoration is similar to that on Bead 4 except that the notched pipestem has been pressed deeper into the clay giving the appearance of a spoked wheel.

Bead 6 (Figure 7), from the west side of the village, is undecorated and consists of an elongated oval 26.3 mm long and 14.4 mm in diameter, while the hole is 3.1 mm across.

Figure 7. Undecorated oval bead (no. 6) (diameter: 14.4 mm).

CONCLUSION

The author has been collecting clay tobacco pipes and researching their makers for 45 years and, as an archaeologist for over 30 years, has seen many excavated objects of various kinds, but the beads described here are among the most unique. They were all found during a 12-year program of scanning the soil of plowed fields surrounding Norton St Philip. Whether these beads were made just for the village market or for wider distribution is not clear, but none have been recorded anywhere else in either Somerset or any of the adjoining counties. Neither have the gaming pieces found in Norton St Philip, decorated with other elaborate motifs, been recorded beyond the parish boundary. This suggests that whereas general household items such as pipeclay wig curlers might have been made for distribution to nearby market towns, the gaming pieces and beads were made only for the people in the village, perhaps produced during quiet times in the workshop or when a worker had a short period of time to spare at the end of the day and a lump of clay which needed to be used up.

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BEADS AND PENDANTS FROM SEDEINGA, NUBIA

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Excavations conducted during the 2009-2014 seasons at the burial site of Sedeinga, Nubia, produced 3,400 beads and pendants of various materials which date to the Late Napatan and Meroitic periods, ca. 400 B.C.-A.D. 300. The chronological, geographical, and political situation of the site made the bead assemblage exceptionally rich in organic and inorganic materials as well as the technologies used to make the objects. During a period dominated by faience and glass in bead production, the use of organics and stones indicates strong links with the neighboring Nubian deserts, an overland connection with the Red Sea coast, and, surprisingly, an interest in the resources of the Nile River. A preliminary assessment of the beads provides more specific evidence to help date some of the Sedeinga tombs. Furthermore, due to known parallels, a few Sedeinga bead types can be associated with specific age groups.

INTRODUCTION

Sedeinga is located on the west bank of the Nile in Sudanese Nubia, between the Dal and Third cataracts (Figure 1). The site is marked by the ruins of an Egyptian temple dedicated to Queen Tiyi, Great Royal Wife of Amenhotep III, and a huge Napatan-Meroitic cemetery extending to the west of the temple. The necropolis is divided into three sectors (I, II, III), separated by two wadis (Rilly and Francigny 2013).

Excavations in Sector II of the cemetery between 2009 and 2014 uncovered 3,400 beads and pendants (Rilly and Francigny 2010, 2011, 2012, 2013). These were found in 31 tombs with multiple burials and in 13 surface collections. The tombs have been ascribed to the Late Napatan and Meroitic periods, ca. 400 B.C.-A.D. 300 (Rilly and Francigny 2013). Many beads were found in disturbed contexts in looted tombs, though some beads were still preserved in their original positions. These comprised necklaces (Figures 2; T192; 3; T262; 4; T293 c2) and a wristlet (Figure 4, T293 c1). Some of the finds have already been illustrated in excavation reports (Rilly and Francigny 2011: Plates 2-3, 2012: Plate 3, 2013: Plates 4-5).

While it is too early to provide a quantitative analysis of the Sedeinga material, a broader and more general perspective on Nubian beads has been presented elsewhere (Then-Obłuska 2014: Plate 3). Faience beads dominate bead assemblages in Napatan Nubia and constitute the second largest share just after glass during the Meroitic Period. Faience did not disappear from grave assemblages after this period and, unlike contemporary Egypt, it dominated post-Meroitic bead assemblages during the 4th-6th centuries A.D. Nevertheless, beads and pendant amulets would never again be found in as great a variety as during the Napatan and Meroitic periods. During the latter period (as can be observed to the north and south of the Fourth Cataract region) organic materials, including mollusk shells and ostrich eggshell, almost disappear from bead repertoires while there is an increased presence of stone objects.

In contrast to contemporary Roman Egypt, Nubian bead adornments were buried with children, males, and females alike. Furthermore, some beadwork and bead types can be associated with a specific age group (Then-Obłuska 2014). Although bead adornments were found in the disturbed context of multiple burials at Sedeinga, thanks to known parallels, some bead types can be associated with child burials. In the case of surface finds and tombs with no pottery, the bead finds allow more specific dating of the grave assemblages. In turn, the varied bead repertoire from Sedeinga allows us to introduce new types into the Meroitic bead typology.

THE SEDEINGA ORNAMENTS

The ornaments from Sedeinga are made from a variety of organic and inorganic materials. The former include mollusk shells from marine and freshwater environments, and ostrich eggshell. The inorganic category includes stone, kaolin, faience, glass, and metal.

Mollusk Shells

The mollusk shells used to produce ornaments encountered at Sedeinga came from the Nile River as well as the Red Sea. More than 2,200 **Nile mollusk shells**, in

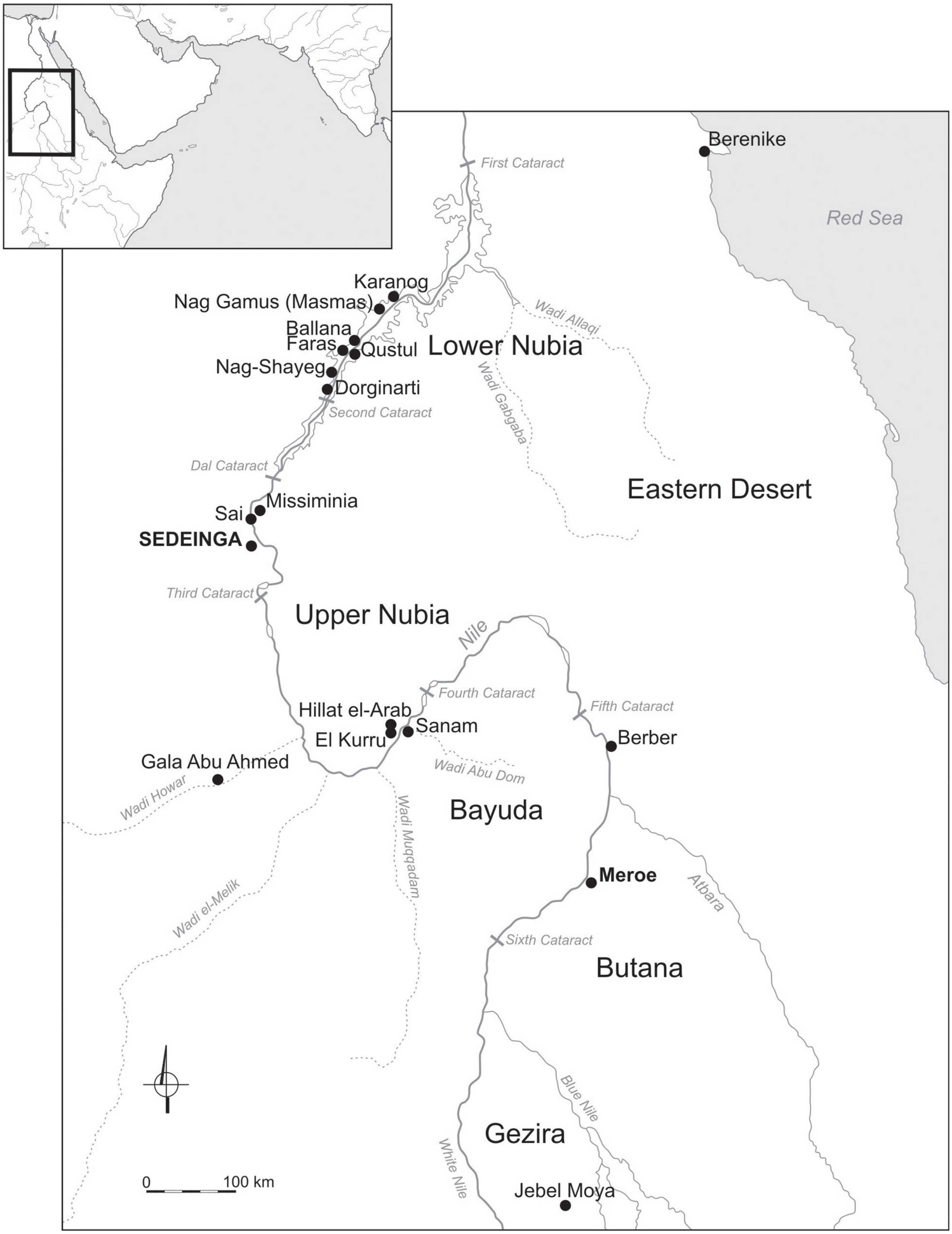

Figure 1. Map of Nubia showing the locations of the sites mentioned in the text (drawing: Szymon Maślak).

Figure 2. Beads and pendants from Tomb 192 (modern stringing) (all photos by author).

Figure 3. Beads and pendants from Tomb 262 (modern stringing).

addition to clay ones, comprise an extraordinary group in Tomb 191. It includes 2,177 shells of *Bellamya* sp. (Van Damme 1984: Figure 5) (Figure 5: T191 d1, d1/f, d1/i), 27 shells of *Melanoides tuberculata* (Van Damme 1984: Figure 24a, 25) (Figure 5: T191 d1, d1/h), and 13 shells of *Natica* sp. (Figure 5: T191 d1/g). While Red Sea shells are known from Napatan and Meroitic bead repertoires in the Nile Valley, the use of perforated Nile shells in Roman-dated beadwork is seldom mentioned in the literature. Two beads made of faience and drawn glass, respectively, from Tomb 191 date the context to the Meroitic Period.

While finds of perforated **Red Sea shells** at Roman ports on the Red Sea are not surprising, their presence in the Nile Valley indicates strong links with the coast. Five small shells of *Marginella* sp. have had their backs removed (Figure 2: T192 c4/b). *Marginella* sp. are present in broad beaded collars at Meroë, Nubia (Schäfer 1910:22, Abb. 142, Taf. 33, 34; Wildung 1996:324-325, nos. 365, 366). One of them was found in the Tomb of Queen Amanishakheto (Wildung 1996:325, no. 366) and belongs among the most splendid examples of the use of *Marginella* shells in Meroitic beadwork.

Oliva sp. with the apex removed (Figure 6: T238 c15) and *Cyprea annulus* with the back removed (Figure 7: T273 c1) are also found in Meroitic contexts at Qustul (Oriental Institute Museum, University of Chicago [OIC], E21513, E21752), Missiminia (Vila 1982:65-66, Figure 57), and Meroë (Dunham 1963:108, Figure 81, g; Museum of Fine Arts Boston [MFA] 23-1-52). Interestingly, *Cyprea* sp. is very common at coastal site Ed-Dur in Oman, with the main occupation during the 1st century A.D. (Haerinck 2001).

Oliva and *Cyprea* are also among the Red Sea shells found in Napatan tombs (Griffith 1923: Plate XXXVII; Vercoutter 1975: Figures 4, 8, 23; Vincentelli 2006: Plate IV, 4).

Ostrich Eggshell

Ostrich eggshell is an easily recognized bead material due to the pitted exterior surface and a thickness that does not exceed 2.3 mm (Figures 6: T238 d1/c; 8: T184 d1/a; 9: T186 c1/c; 10: T195/a). Although it is considered the most characteristic feature of ancient Nubian material culture since the Neolithic period (e.g., Then-Obłuska 2014), it is rarely found in the Lower Nubian region during the period under discussion. Still, ostrich-eggshell beads with a large diameter and a large perforation are known from Napatan assemblages (e.g., Dunham 1963: Beg. West 503, 23-M-710, and Beg. West 774, 23-3-568; Griffith 1923: Plate XXVIII, 74; Lahitte 2013: Abb. 12, Type 1; Lohwasser 2008: Abb. 47, ÄMP 2912; Then-Obłuska 2014: no. 127; Vila 1980: Figure 190, 66-70). In contrast, they are very rare in Meroitic Lower Nubia where they tend to be short cylinders (Then-Obłuska 2015a). Beside these two general types, many diverse forms appear in both periods and it is too early to determine the chronology of the few Sedeinga beads.

Stone

Deserts and river gravels were an excellent source of the stone used to manufacture beads in Egypt and Sudan (e.g., Aston, Harrell, and Shaw 2000:27; Harrell 2010:72-73; Whiteman 1971:258).

The perforations of **standard barrel/globular** beads composed of carnelian and agate are drilled from one end, resulting in a truncated conical shape. While one end of the hole is rounded, the other is truncated and slightly depressed, most probably to facilitate the drilling process. Both ends and sides are polished. The beads (Figure 3: T262 c4/a), ca. 9 mm in diameter, were found with serrated-lentoid faience examples dating to the Late Napatan Period.

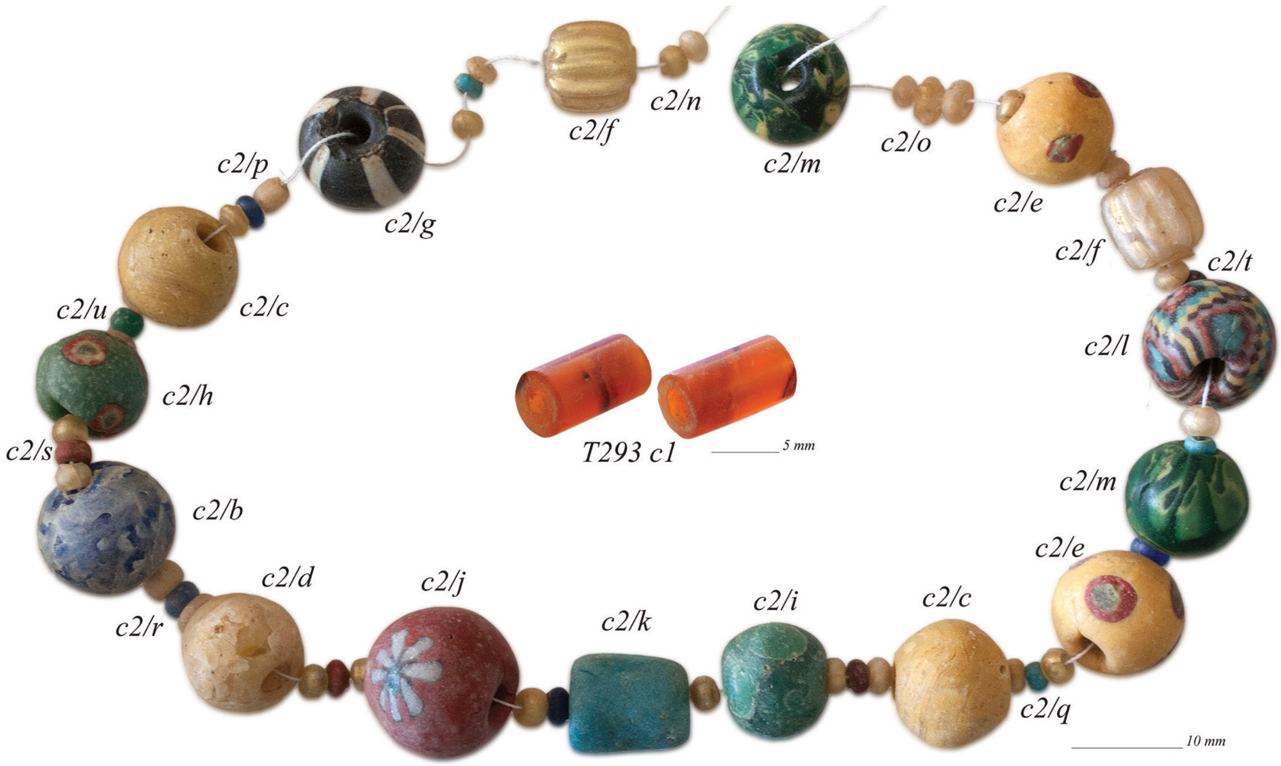

Figure 4. Beads from Tomb 293 (modern stringing).

A small carnelian **barrel bead** ca. 5 mm in diameter is one of the most common types in the Meroitic bead repertoire (Figure 10: T211 d3/b). It is roughly shaped with a highly polished surface. A saw mark that facilitated setting the drill in place is discernable adjacent to the larger end of the truncated-conical perforation.

The ends of a **long cylinder** fashioned from carnelian were simply cut off and left unpolished (Figure 4: T293 c1). Drilled from one end, the perforation has a truncated-conical shape. It was the only bead that formed the wristlet of a child burial in Tomb 293. Long cylinders have been found with other Meroitic child burials at Nubian sites at Dorginarti (OIM E24324) and Nag Gamus (Museo Arqueológico Nacional, Madrid 1980.98.59), as well as in one grave at Berber (T33/256; pers. obs.). They were also recorded at the Berenike port site on the Red Sea (BE00/33/019#21; pers. obs.).

Teardrop pendants are another characteristic feature of Meroitic assemblages, recognizable in necklaces that decorate some Nubian pottery (Then-Obłuska 2015a). Like other stone ornaments of that time, they exhibit traces of saw marks next to the larger end of the perforation. Two main pendant types are present at Sedeinga: globular and lenticular.

The pendants with **globular** bases (Figure 10: T196 d1) have been found at other Meroitic sites and constitute a crucial element of Meroitic necklaces. They are strung alternating with a few small carnelian, glass, gold-in-glass, and faience beads as preserved on strand fragments recovered at Sai (Then-Obłuska 2015a). Longer, flattened teardrop pendants have rounded and slightly **lenticular** bases. They are made of carnelian, black steatite, and white quartz (Figures 2: T192 c6/a-c; 10: T211 d3/a).

Ear studs or earplugs, small objects made from a variety of materials, have a narrow shaft connecting two heads, one smaller than the other. They were probably inserted in a hole in the earlobe or nose. Three kinds have been distinguished in the region based on the shape of the larger head (Williams 1991a:110-111, Table 23). At Sedeinga, the material of the two recovered studs is white stone. The larger circular head is carved to form an eight-petal rosette (Figures 9: T186 c2; 11: T187 d1). Each petal has a hole drilled through it near the tip. Alternating black and purple stone dowels are set into the holes and a black disc is set into the rosette's center. There are remnants of a black adhesive. A similar seven-petal ear stud was found at the neck of the individual in grave 956 at Faras (Griffith 1924: Plate LIX, 8, 1925:114). The Sedeinga examples are similar to a six-petal specimen found in Ballana tomb B 174-3 with infant II and

Figure 5. Beads and pendants from Tomb 191 (modern stringing).

Figure 6. Beads from Tombs 225, 229, 238, 239, 242, 248, 253, and 255.

adult female burials. It is ascribed to the IIIB type group (Williams 1991b: Plate 76c, OIC E22559) which dates to around the second half of the 2nd century A.D. (Williams 1991a:18-19).

Kaolin

Sun-dried kaolin beads and pendants were found together with Nile mollusk shells (Figure 5: T191). There are **teardrop pendants** with globular bases in three sizes (Figure 5: T191 d1/b-d). While the largest are elongated and finished with some burnishing tool, the others are not. Some pendants are coated with a red pigment (Figure 5: T191 d1/a).

Kaolin **beads** have long-bicone and irregular-globular shapes (Figure 5: T191 d2/a-b). Some may have been placed in hot ashes for a short time, resulting in a brown to grey color (Figure 5: T191 d1/e). While kaolin specimens have not yet been confirmed at Meroitic sites, hand-made beads of pink clay were found at the Meroitic Sai cemetery (Then-Obłuska 2015a), the Early Roman Elephantine (Rodziewicz 2005:35), and at Berenike (Then-Obłuska 2015b: Figure 3,12).

Faience

In contrast to glass, faience (glazed composition) objects were shaped in a cold state before being fired (Spaer 2001:308). Whereas disc and cylinder beads of varying lengths were formed from tube segments, some pottery and stone molds found at Meroë suggest they were probably used in the production of faience beads and amulets (Näser 2004: objects 245-246; Shinnie and Bradley 1980: Figure 80).

Disc and **short cylinder** beads in blue, white, yellow, and red are the most common types among faience beads at Sedeinga. While **rings** with a large perforation (Figure 3: T262 c2/b) are found with Napatan serrated beads, **short cylinders** match Early Roman/Meroitic bead types. They are blue, white, red, and black in color (e.g., Figures 2: T192 c5/a-d; 9: T186 c1/a-b; 11: T187 d2/a-b; 12: T188 c1/a-c; 13: S041/c-i). Some of the Meroitic short cylinders are characterized by a very thick glaze layer and a very fine core (Figure 7: T268 c1/a). They are also present at other Meroitic Lower Nubian and Early Roman Egyptian sites (Then-Obłuska 2015b). **Long cylinders** are found with beads dating to the Meroitic period (Figures 2: T192 c3/a; 6: T238 c17, T255 d1; 8: T184 d1/b; 10: T211 d1/a).

Figure 7. Faience and cowrie-shell beads from Tombs 268 and 273 (modern stringing).

Figure 8. Beads from Tombs 169, 176, 180, 183, and 184.

Among larger beads, the blue **globular** (Figure 13: S019/a, S041/b) and white **barrel** examples (Figure 13: S059) are surface finds, as is a blue long cylinder (Figure 13: S041/a). The latter is also present in a Meroitic necklace in Tomb 293 (Figure 4: c2/k).

The **fluted conical disc** (Figure 6: T239 d2) type is said to be from the 23rd Dynasty (Beck 1928: Figure 21, A.2.e). Indeed, fluted cone and bicone beads are known from Napatan contexts (e.g., Then-Obłuska 2014: Figure 1, nos. 95, 97). They are also found at Meroë and called rosette beads (Shinnie and Bradley 1980: Figure 66, Item 2138).

The **lotus** or **jasmine flower-bud** bead (Beck 1928: Figure 24, A.1.e) is a long truncated cone with one decorated end (Figure 11: T187 d4). Similarly shaped beads were used for horse (Dunham 1950:110; Reisner 1919:252; MFA 21.10569a, 21.10560, 21.10567) and child adornments during the Napatan Period (Vercoutter 1975: Figure 5.1). A flower bud with a base divided into quadrants is also present in the Meroitic bead repertoire; e.g., at Meroë (Dunham 1963: Plate S, XIIIc) and with a child burial at Missiminia (Vila 1982:77-78, Figure 73.3b).

Three **serrated-lentoid** beads are said to derive from the Eye of Horus (Figure 3: T262 c4/b-d). They have blue-glazed exteriors and whitish cores. These beads are known from burial and settlement sites in Nubia (Gerharz 1994:150-155; Lohwasser 2004: Taf. 1B, no. 14), and are usually associated with child burials dated to the Late Period in Egypt or the Napatan Period in Nubia (e.g., Brunton 1930, III: Plate XLIII, 2; Dunham 1963: Figure S, Types Xa, Xb, and Xc(?); Griffith 1923: Tombs 783, 1058, 1213, Plate LX, 11; Vercoutter 1975: Tombs 6, 8, 13, 17, 20, 22; Vila 1980: Tomb 416/2, Figures 39:5, 189:32). At Jebel Moya in the Southern Gezira Plain, where serrated beads have been considered to be imports (Addison 1949:110-115, Plates XXXIX: C, XLV; Gehartz 1994:148), they are found with adults.

A **square-plaque** bead exhibits decorative elements on both sides (Figure 2: T192 c4/c). A similar pattern, but only on one side, is present on objects from the Napatan cemetery at Sanam (Griffith 1923: Plate LIV, 3-4). Square faience beads, however, are also found at Meroitic sites (Edwards 1998:63, Figure 3.1, object 3903).

Small **teardrop pendants** with a rounded base and flattened on one side were found in a tomb ascribed to the Late Napatan Period (Figure 3: T262 c2/a).

Figure 9. Beads and stone ear stud from Tomb 186.

An **ankh-above-crescent pendant** is present in the Sedeinga adornment assemblage (Rilly and Francigny 2005: Plate XXIV) (Figure 13: S001). Such a pendant was also found at Sai (Then-Obłuska 2015a) and at Nag Shayeg (Pellicer Catalan 1963:96, Figure 23, Type 58). Similar pendants made of silver were found in the robbers' passage at Noubadian Ballana (Emery and Kirwan 1938, I:83, 216, 1938, II: Plate 48 D, B-4-27). The same motif was used on Meroitic pottery and the ankh-above-crescent was also noted as a stamped impression on clay seals on amphorae from Noubadian Qustul (Emery and Kirwan 1938, II: Plate 115-28).

An exceptionally large **Bes amulet** pendant is more than 4 cm high (Figure 14: T178 d1). It has a blue glazed body and applied green decoration. Although slightly different in style, the same technique is recorded for Bes from Quseir, 1st-3rd centuries A.D. (Meyer 1992: Plate 14, no. 366; Whitcomb and Johnson 1982: Plate 59g; OIM E45910). A similar decorative technique was used on an ear stud from Sedeinga (Figure 13: SO25).

A fragment of a faience amulet represents the Egyptian god of air, **Shu** (Figure 3: T262 c3). He is shown kneeling, with his arms raised to support the heavens and the solar disc above his head. During the Late Period, these amulets were often placed in the mummy wrappings on the torso of the deceased.

Another fragmentary amulet is in the form of **two men's heads back to back** (Figure 15: T216 c1). An amulet of two men squatting back to back, made of glazed steatite and 12 mm in height, is known from Meroë Tomb W 27 (Dunham 1963:106, 22-2-460j, Figure 79h). The faces and upraised hairstyle of the Sedeinga specimen may be found in images of Eastern Desert captive enemies usually presented in a squatting position in Nubian, including Meroitic, art (Baud 2014:777, Figure 8; Wildung 1996: nos. 274-275). A similar head, identified as that of a woman, is observable in the stamped impression on a pottery fragment from Meroë (Näser 2004:245, item 6182, Figure 111).

An **ear stud** in blue faience has a characteristic shape with conical heads (Figure 13: S025). The perimeter of the larger head is decorated with 15 green blobs and one at the apex. Objects of blue faience decorated with yellow or green elements are found among Early Roman ornaments. Similar conical specimens made of stone (Shinnie and Bradley 1980: Figure 85, 295, 1027) and of faience (Shinnie and Bradley 1980: Figure 73: 1840, 2070) were found at Meroë. Conical ear studs continued into the Post-Meroitic Period in Nubia (e.g., Säve-Söderbergh et al. 1981: Plate 103:2).

Glass

The glass beads may be assigned to four groups: drawn segmented, drawn unsegmented, mandrel wound, and mandrel formed.

Drawn Segmented Beads

Drawn glass tubes could be segmented in stone molds such as those found in Early Roman Alexandria (2nd-3rd centuries A.D.) (Kucharczyk 2011:63-64, Figure 8:1). The shape of the molds suggests the production of collared beads, the primary shape of some gold-in-glass beads of that period.

Simple, monochrome single- and multiple-segment beads are commonly found at Meroitic and post-Meroitic Nubian sites. They are translucent dark blue (Figure 10: T201 d1/a), translucent green (Figure 10: T201 d1/b, T211 d1/b), and opaque red (Figure 4: T293 c2/s). The yellow color of one drawn specimen may be due to patination (Figure 2: T192 c5/f). Some drawn beads are pear-shaped (Figure 8: T176 d1) while others are in the form of a square cylinder (Figure 2: T192 c3/b).

Figure 10. Beads and pendants from Tombs 195, 196, 201, 203, 207, 211, and 215.

A large globular black bead, most likely of drawn manufacture, exhibits six longitudinal white **stripes** (Figure 4: T293 c2/g). Although it has rough ends, traces of the segmented portion are preserved there.

Some drawn beads are of **compound** construction, being composed of two glass layers. One broken double-segment bead has a red exterior and a colorless core (Figure 13: S041/l). It is a common type in Meroitic bead assemblages (Then-Obłuska 2015a). Orange-on-red beads are also present (Figures 10: T215 d1/a; 13: S007). While opaque orange beads have been previously found at Sai (Then-Obłuska 2015a), the orange-on-red specimens are new to the Meroitic bead assemblage.

Although some doubts have been expressed (Arveiller-Dulong and Nenna 2011:175, note 28), **metal-in-glass** beads are said to have been produced at the Early Roman Elephantine (Rodziewicz 2005:34-35), as well as at Meroë (Markowitz 2012:198), although no details are offered. Sourcing gold-in-glass beads may be accomplished through chemical compositional analysis as in the case of glass from Bara in Pakistan (2nd century B.C.-2nd century A.D.) (Dussubieux and Gratuze 2003:318-319). Drawn gold-in-glass beads from Lower Nubian Meroitic sites appear to have been made using natron of Egyptian provenance or plant-ash soda glass of Central Asian origin (Then-Obłuska and Wagner 2015).

Gold-in-glass bead forms include large and small melon beads (Figure 4: T293 c2/f and c2/o, respectively), as well as single- and double-segment short to long barrels (Figures 4: T293 c2/n, c2/p; 6: T242 c1/b, T248 c1/a-b). Some specimens retain only the inner glass layer with traces of the metal foil (Figures 6: T192 c3/c; 12: T215 c1/d; 13: S041/k).

Drawn Unsegmented Beads

The beads in this category appear to have been pinched from unsegmented glass tubes. They include **simple** beads made of blue glass in both oblong (Figure 2: T192 c6/d) and globular (Figure 13: S031/a) forms.

Mandrel-Wound Beads

Monochrome beads produced by winding molten glass around a mandrel are scarce. They include an oblate specimen of translucent purple glass (Figure 13: S041/j), two globular of opaque light gold glass (Figure 4: T293 c2/c),

Figure 11. Beads and stone ear stud from Tomb 187.

and an oblong one of cobalt blue glass (Figure 13: S031/b). The surfaces of some beads are crackled and characterized by different glass hues. They are blue, yellow, and turquoise in color (Figure 4: T293 c2/b, d, i). Five globular beads of mustard-gold-colored glass (Figure 13: S019/d) found on the surface with other Meroitic beads may be of wound construction. A **polychrome** wound bead of opaque blue glass is trail-decorated with a translucent dark blue wavy band around the middle (Figure 8: T176 c2). It measures 9.7 mm in diameter.

While wound glass beads are characteristic of Napatan bead assemblages, they are generally less common in the Early Roman period which is dominated by drawn types.

Mandrel-Formed Beads

A barrel-shaped bead formed by the joining technique is composed of eight cane slices in a rolled-pad pattern of dark purple and yellow with the addition of a central blue band and white ends (Figure 2: T192 c2). Spaer (2001:42) illustrates a bead with multiple seams which she considers "rare." Similar dark purple and yellow cane sections set between white ends have been found in the Northern Black Sea region (Alekseeva 1982: Plate 48, 23).

Figure 12. Faience and metal-in-glass beads from Tomb 188.

Beads composed of three rolled-pad pattern mosaic slices were found in a Meroitic tomb at Sai (Then-Obłuska 2015a), and a bead with a similar pattern was found at Gabati, but in a context dated to the 7th century A.D. (Edwards 1998:129, 234, Figure 11, no. 2716). Plaques and beads made using mosaic cane sections with a rolled-pad pattern are considered to be Egyptian products dating from the 1st century B.C. to the 1st century A.D. (Arveiller-Dulong and Nenna 2011:207, no. 284, 378, no. 612, 390, no. 643; Dubin 2009:369, Timeline no. 513; Spaer 2001:123, no. 203; Van Loon 2001:13.9c). The same Hellenistic motif, but in silver, may be observed on the two bronze foreheads of Dionysos found in the Tomb of Prince Araka(n)kharor (Baud 2010:203; MFA 24.957 and Sudan National Museum 1948).

Two globular beads are composed of mosaic cane segments with translucent green centers bordered by opaque yellow set in a green matrix (Figure 4: T293 c2/m). They are said to imitate **serpentine** (Nenna 2002). This glass is found

Figure 13. Surface-collected beads, pendants, and ear stud.

Figure 14. Faience and metal pendants from Tomb 178.

in Roman beads (Arveiller-Dulong and Nenna 2011:205, no. 277:4; Kucharczyk 2010:125), a pastille dated between the 1st and 4th centuries A.D., a plaque fragment of Egyptian or Italian production, fragments of a plate dated to the 4th century A.D. (Arveiller-Dulong and Nenna 2011:341, no. 559, 412, nos. 703-704, 416, Add. 1 and 3), and fragments found near Heïs on the north Somali coast (Stern 1991: Figure 6.1). A pendant of this glass from Coffin B in Tomb LXVI at al-Bagawat, Kharga Oasis, Egypt, is dated to the 4th-7th centuries A.D. (MET 31.8.5).

Possible gaming counters or wall decoration of serpentine mosaic glass were found in a house in Alexandria dated to the 2nd-3rd centuries A.D. (Kucharczyk 2010:67, Figure 7, 2, 2011: Figure 9, 3). Since many canes of serpentine mosaic glass have recently been uncovered in Alexandria (Kucharczyk 2010:125), they were most probably fashioned into final products there.

A globular **checkerboard** mosaic bead is composed of three mosaic cane sections fused together on a mandrel (Figure 4: T293 C2/l). The checkerboard type is dated to the Early Roman period and said to come from Egypt and/or Persia (Spaer 2001: nos. 214-215). They were found in a glass bead workshop at Tibiscum in Romania which was in use during the 2nd to 4th centuries A.D. (Benea 1997: Abb. 12:2-3). Nevertheless, these beads have been encountered at many sites of the ancient world (e.g., Brunton 1930: Plate XLVI, 175; Griffith 1924: Plate LXII, 3; Silvano 2005:121, Color Plate 25; Spaer 2001:125, no. 215; Woolley and Randall-MacIver 1910:75, Plate 40, nos. 7811, 7913). Checkerboard glass, with diverse color patterns, is known from late antiquity (Lankton 2003: Figure 7.0, 596). Globular checkerboard beads have been found in Nubian royal tombs (Emery and Kirwan 1938: Plate 46D, no. 157) and post-Meroitic contexts at Serra (Williams 1993:230; OIM E19841). It is uncertain if these are reused Meroitic items. The production of checkerboard mosaic beads continued into the Medieval period (e.g., Siegmann 1997:138, Taf. 3, 4 – H11/A1).

Similar to the checkerboard bead, three mosaic cane sections were joined around a mandrel to form a globular **flower** bead (Figure 4: T293 c2/j). A string of deep blue spheroids with three "marguerites in white and yellow," a pattern that parallels the Sedeinga decoration, was found in Grave 331 at Karanog. It was worn by a child on the upper left arm (Woolley and Randall-MacIver 1910:75, 174-175, Plate 109, object 40099).

Some mandrel-formed globular beads of monochrome yellow (Figure 4: T293 c2/e) and green (Figure 4: T293 c2/h) glass were inlaid with **eyes** in red, yellow, and translucent green. Identical eye-cane sections were applied to blue glass beads forming the armlet of a child in Meroitic grave B 87 at Ballana (Williams 1991a:134, Figure 47g, 1991b:204; OIM E22731).

The checkerboard, flower, and eye bead types were found in Sedeinga tomb T293. They were also encountered at Ballana in Tomb 161 which contained an adult male(?) and a $6^{1}/_{2}$-year-old child. It is dated by location to Phase IIB-IIIA, ca. 50 B.C. to ca. A.D. 150 (Williams 1991a:137, 1991b:225, Plate 80a; OIM E22679).

Metal

A metal pendant consists of a rectangular plaque with a suspension loop at the top (Figure 14: T178 d2). A similar plaque is known from a Meroitic grave at Ballana (OIM E22526). Petrie (1914:44, Plate XXXVII, 209e) illustrates metal plaque pendants among Egyptian amulets, including one of cast lead that depicts the Hathor cow.

Figure 15. Broken amulet in the form of two men's heads back to back from Tomb 216.

CONCLUSION

The Late Napatan/Meroitic artifact assemblage from Sedeinga contains beads and pendants made using a wide range of materials and techniques. Except for an extraordinary group of Nile mollusk shells, faience and glass beads and pendants dominate the ornament assemblage. The patterns of the mosaic glass beads and the forms of some of the metal-in-glass specimens are sophisticated and rare in their categories. All the adornments were apparently employed in the production of necklaces and wristlets.

While a variety of the Red Sea mollusk shells and ostrich eggshell from the Nubian deserts have a long history in Nubian beadwork, the use of mollusk shells from the Nile has not previously been noted. The Nile shells were found together with beads and pendants made of kaolin, a material that was rarely used to manufacture ornaments during the Late Napatan/Meroitic Period. Some kaolin teardrop pendants appear to be made in imitation of their stone counterparts. Pendants of carnelian, quartz, and steatite, as well as small globular and long cylinder beads of carnelian, are diagnostic types for Meroitic Nubia. The long cylinders are usually found threaded as children's wristlets.

The teardrop pendants, the flower design on the stone ear studs, the ankh-above-crescent motif, and the features of the Eastern Desert enemy are easily recognized elements in Meroitic art. Furthermore, the pattern of larger glass beads or stone pendants alternating on a strand with a few smaller beads is also commonly repeated in necklaces displayed in Nubian art, especially as a painted decoration on pottery vessels.

The Sedeinga ornaments embody a society that followed Late Napatan/Meroitic fashion. While strongly attached to the local environment, it also had broad and far-reaching contacts with the Mediterranean world via the Nile and the Red Sea coast across the Eastern Desert. While links to India are suggested by some elements of Meroitic monumental art (e.g., the lion god Apedemak and elephant imagery; Haaland 2014), chemical compositional analysis of glass samples should help answer the question of overseas bead imports during a time of intensive maritime trade.

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ELITE DRESS AND REGIONAL IDENTITY: CHIMÚ-INKA PERFORATED ORNAMENTS FROM SAMANCO, NEPEÑA VALLEY, COASTAL PERU

Benjamin Carter and Matthew Helmer

This article addresses two central components of the study of perforated ornaments recovered from archaeological contexts: 1) the explication and analysis of the relationship between perforated ornaments and identity production, and 2) the collection of data specific to perforated ornaments. By comparing perforated ornaments from the Chimú-Inka period (ca. 1470-1532) elite tomb at Samanco, Peru, to those from other sites, patterns in the use of perforated ornaments in identity negotiation may be identified and assessed. We demonstrate that perforated ornaments were deployed to demonstrate local, regional, and imperial identities, though in an ambiguous way that could have been mis- or reinterpreted. Although a central component of the assessment of identity negotiation involves comparison with perforated ornaments from other sites, this study is limited because they are rarely described in detail. In an effort to remedy this situation, we provide detailed methods and results as baselines for future comparison.

INTRODUCTION

Perforated ornaments, including beads and pendants, were central to the creation of social identity in societies throughout the world in the past and into the present (e.g., Sciama and Eicher 1998). The use of ornaments to adorn and characterize the self are arguably central to what it means to be human and their initial appearance may coincide with the development of the modern mind (e.g., White 1993; Zilhão 2007). As with all clothing and ornamentation, they are employed to modify the human body, establishing and negotiating identities that unify or distinguish through the creation of communities. These can be geographic; people within a certain area – whether a village, city, valley, or region – share similar ornament repertoires, allowing one to immediately recognize another as belonging. Or they can be gendered; certain materials and types of ornaments, or how they are situated, engender the body (e.g., Gassón 2000; Malinowski 1922; Meisch 1998; Sciama and Eicher 1998). In hierarchical societies, some forms of ornamentation, in kind, degree, or quantity, may be worn only by those in power and others may be restricted to those with little power. ThesFiguree communities intermingle in time and space. People across extensive regions may share the same set of materials, but deploy them uniquely to situate themselves within local communities, genders, and hierarchies. Those in power tend to use their increased access to resources to acquire more, larger, or more valuable ornaments.

Yet, perforated ornaments have infrequently been studied with identity production in mind and are rarely central components of archaeological analysis. Beads and pendants are often relegated to the "specials" categories and are seldom fully documented (*see*, however, Allen et al. 1997; Blick et al. 2010; Cabada 1989; Carter 2008; Masucci 1995; Moore and Vilchez 2015). While many report material and/or color in a general manner and may provide a minimal description of perforated ornaments, rarely are they more fully documented and analyzed. Currently the literature on perforated ornaments represents only a tiny fraction of the archaeological and ethnographic occurrence of these objects. The perforated ornaments recovered from an elite Chimú-Inka tomb at Samanco, Peru, present an ideal opportunity to demonstrate the value of in-depth quantitative and qualitative analysis of perforated ornaments with the goal of establishing how these objects were employed in the negotiation of identity.

The tomb at Samanco in the Nepeña Valley contained over 3,000 perforated ornaments along with the remains of four individuals from the Chimú-Inka period. In A.D. 1470, the highland Inka conquered the Chimú, an empire that was only a century old. The elites within this tomb operated within the Inka Empire, but their ancestors had worked within the Chimú Empire. An increasing body of literature demonstrates that local leaders, even though archaeologists have labeled them the Chimú-Inka, both participated in and actively resisted the hegemony of the Inka Empire (López-Hurtado and Nesbitt 2010; Mackey 2011). Mackey (2011) argues that, in the Jequetepeque Valley to the north of Chan

Chan, the Inka actively engaged local lords, cutting the Chimú lords, who had ruled the valley for more than 100 years, out of administration. Similar arrangements appear to have been established to the south among the Chincha as well (Nigra et al. 2014; Rostworowski de Díez Canseco 1970). Local lords appear to have utilized imperial material goods such as the aryballo, a specifically Inka form of ceramic, but in a hybrid variety that physically connected local concepts of ceramics with those of the empire (Costin 2015; Hayashida and Guzmán 2015; Mackey 2011). These people, who likely were neither Inka nor Chimú, have been labeled the Chimú-Inka, largely based on similarities to ceramics from the Inka and Chimú heartlands.

The elite burials at Samanco suggest a similar hybridity. Perforated ornaments reflect materials and types of ornaments with deep histories on the coast, but are also ambiguous enough so as to allow the wearer to visually claim connection to the imperial Inka. This article demonstrates the value of archaeologically recovered personal ornamentation in addressing questions of ethnic identity. It is, however, limited by comparative material from other sites as relatively few perforated ornaments have been published in any detail. Therefore, this article also presents data that can be used in future studies of perforated ornaments in South America and elsewhere. Similarly, because relatively few studies have explicated their methods, we describe and discuss how and why data were collected.

ANDEAN MARITIME SOCIETY AT SAMANCO

The arid coastal Andes have facilitated complex societies for over 5,000 years, fueled by a rich sea biomass and an array of cultigens. Bead use for adornment has been documented at least as far back as 2500 B.C. (Shady Solís 2006:58; *see also* Aldenderfer et al. 2008), a testament to the prominence of beads in Andean society. As Gassón (2000:583) notes, beads are particularly salient through their economic value and labor cost, and are therefore important indicators of socio-political processes. In the coastal Andes, beads and other adornments were a part of long-distance exchange systems that formed the basis of prestige economies (e.g., Burger 2008; Burger et al. 2002; Goldstein 2000; Marcos 1977; Paulsen 1974). Beadmaking and use eventually evolved into highly industrialized commodities aimed at the high-ranking members of society who are the focus of this article.

Early Andean societies focused corporate efforts on ceremonial temples until the 1st millennium B.C., or Early Horizon, when urbanization began to spread. Samanco, located in the small river valley of Nepeña on the north-central coast of Peru (Figure 1), developed as an important maritime trading town at this time. In 2012 and 2013, Matthew Helmer and Jeisen Navarro Vega directed 16 weeks of excavations at Samanco to analyze urban transformations associated with maritime lifeways (Helmer 2015; Helmer and Chicoine 2015; Navarro and Helmer 2013, 2014). This article addresses the beads recovered from an intrusive tomb associated with a re-occupation of the site some 1,500 years after its abandonment. The objects date to the Provincial Inka era of coastal imperial conquest during the 14th and 15th centuries.

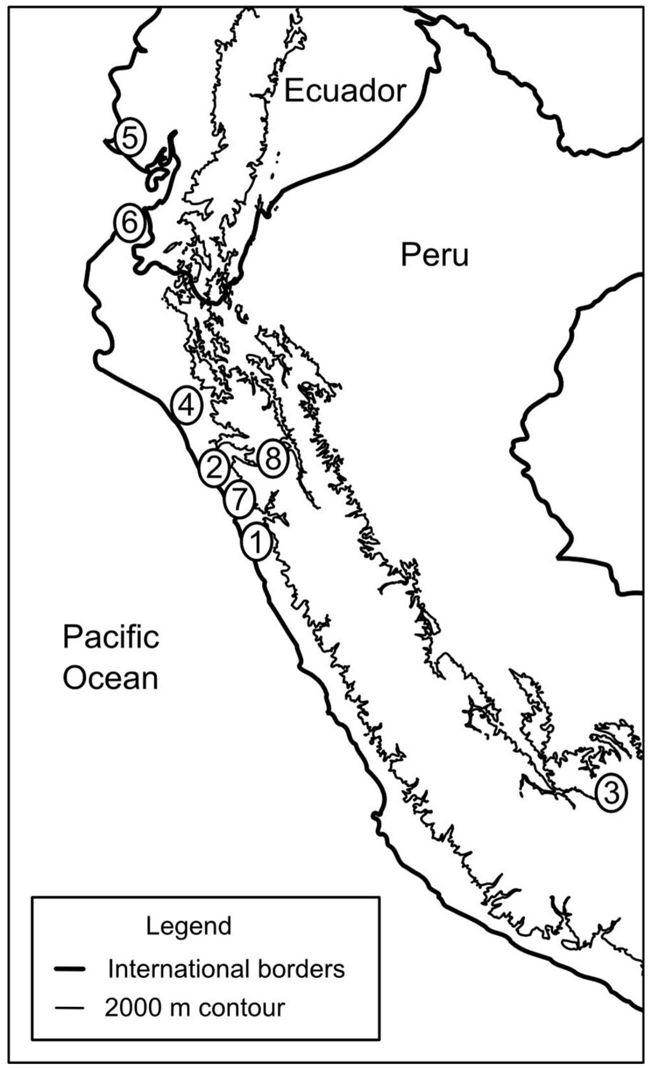

Figure 1. Map showing the location of sites mentioned in text: 1) Samanco, Nepeña Valley, Casma Valley, Huacatambo, and Manchan; 2) Chan Chan and Huacas de Moche; 3) Cuzco; 4) Huaca Loro, Pampa Grande, La Viña, and Sipán; 5) Loma de los Cangrejitos and López Viejo; 6) Cabeza de Vaca; 7) Jequetepeque Valley; and 8) Marcahuamachuco (base map from Wikipedia, shared under Creative Commons CC0 license, modified by Benjamin Carter).

The Samanco site is spread over some 40 hectares along the northern margins of the Nepeña Valley. The site was documented by early surveys (Daggett 1984:218, 1987:74, 1999:3-4; Horkheimer 1965:29; Kosok 1965:209; Proulx 1968:46-50). Helmer's project was the first to systematically map and excavate the site (Figure 2). Samanco is organized into stone-walled residential compounds dated to the 1st millennium B.C. (Helmer and Chicoine 2015). Samanco's ruins saw a rich pattern of mortuary reuse that constitutes the basis of this study.

Over the course of fieldwork, a number of mud-brick structures were documented that did not fit Samanco's typical pattern of stone-walled compounds associated with domestic refuse. At least four massive craters, some over 10 m across, were recorded with mud bricks (adobes) not associated with the early occupation. It became evident that the craters were probably intrusive structures from a post-abandonment occupation. Elsewhere at Samanco, the team knew of commoner burials of the later Casma Culture (A.D. 1000-1400) placed within the ruins of earlier architecture. They hypothesized possible looted funerary structures associated with the craters and completely excavated the largest crater located in the northern extent of the site. This crater corresponded with a rich subterranean multi-structure tomb (Figure 3) which yielded the beads discussed herein.

Tomb recovery involved the initial clearing of post-abandonment sand and debris to reveal associated architecture followed by systematic excavation. Initial cleaning revealed a 6x4-m platform structure at the north end that probably served as the tomb's entrance. Nearly 5 m of sand and rubble lay atop the subterranean tomb structures. Three interior chambers were discovered that measured approximately 2x4 m each and were 1.7 m deep. They had white painted adobe walls and were filled with grave goods. The central chamber had been looted and appears to have held the principal occupants. This chamber was characterized by a megalith placed in the center, either as a table to hold offerings or as a pedestal on which to place the bodies. Each side chamber was undisturbed and held a cache of offerings, as well as sacrificed human and animal attendants placed to accompany the central chamber occupants. At least four individuals were located in the central chamber. Helmer (2015) believes they were elite musicians and weavers, suggested by the wealth of musical and weaving goods found in the central chamber. Based on these items, Carol Mackey (2015: pers. comm.) suggests that the deceased may have been women. Preliminary skeletal analysis indicates that multiple individuals were female, but further study is needed. Analysis of the diverse tomb contents is ongoing.

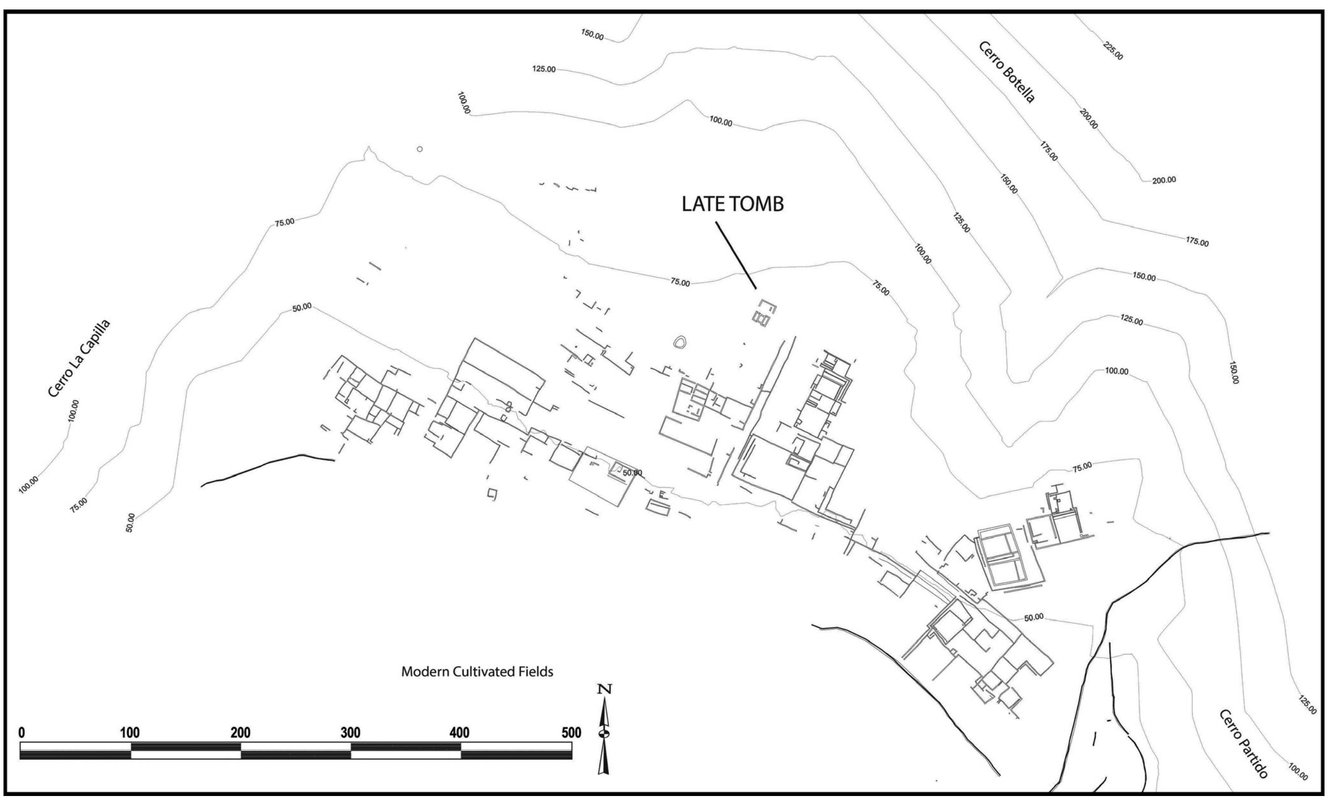

Figure 2. The location of the Chimú-Inka tomb at Samanco (drawing by Matthew Helmer).

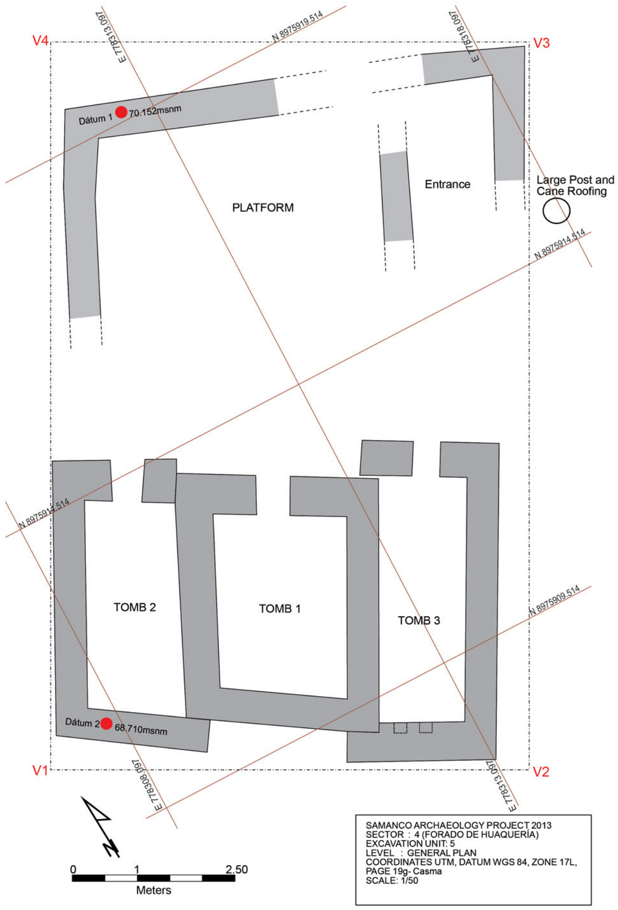

Figure 3. The placement of the tombs (drawing by Matthew Helmer).

All the perforated ornaments were recovered from the central chamber, signifying their close association with the principal elite occupants. The ornaments were meticulously recovered through 1-mm-mesh sieving. They were mixed in the disturbed sub-soil with other grave goods and did not occur in distinct features. They were all disassociated from their original arrangements, but were more heavily concentrated toward the base of the tomb and spread across the floor, suggesting little disturbance from their original contexts. Beads and pendants were most heavily concentrated around human bones and textile fragments, confirming their use as personal adornment for the deceased.

The grave goods indicate a cultural association with the Chimú-Inka era of coastal Andean society just prior to European contact. Examples include the emblematic Chimú blackware molded stirrup-spout bottles mixed with Inka style aryballo jars found in the tomb (Figure 4). From their growing adobe city of Chan Chan, the Chimú established themselves as one of the great empires of the Andes in the mid-14th century. The heart of Chan Chan, a city of approximately 20 sq. km, contained 10 royal compounds (Moore and Mackey 2008; Rowe 1948). These compounds, or *cuidadelas* (small cities), were sequentially occupied by a powerful ruler, his family, and associated nobles. Each cuidadela was ca. 6-20 hectares in size and contained hundreds of rooms in a formalized tripartite layout to which access was greatly restricted (Day 1982). From this city, the Chimú marched their armies north and south along the coast, conquering the people of coastal valleys and exerting significant influence from modern-day Tumbes to Lima, a distance of more than 1,000 km (Moore and Mackey 2008). They established administrative centers in nearby valleys that were used to extract goods and labor from the local population (Mackey 2011; Mackey and Klymyshyn 1990). Chan Chan developed into a metropolis of approximately 40,000 residents (Moore and Mackey 2008). The empire was short-lived, however. By 1470, the Chimú Empire had fallen to the highland Inka who proceeded to decapitate the coastal empire by razing and plundering Chan Chan and carrying leaders and their families off to their capital at Cuzco to be re-educated. Many lower-level local (i.e., non-Chimú) leaders were, however, allowed to retain their positions, now in the service of the Inka Empire, not the Chimú.

The area around Samanco was part of the southern sphere of the Chimú Empire, overseen by the provincial city of Manchan in the neighboring Casma Valley (Mackey 1987; Mackey and Klymyshyn 1990; Moore 1981; Moore and Mackey 2008) and the smaller Nepeña outpost of Huacatambo (Proulx 1968:125-126). By 1470, the Inka Empire had conquered the Chimú through much resistance, but appear to have kept local lords in power (Moore and Mackey 2008:801). The identity of these lords and the materials associated with them is still not well known.

ANALYZING LORDLY DRESS AT SAMANCO

The elite within the Samanco tomb were interred with a spectacular and diverse range of perforated ornaments. The richness of this tomb makes it ideal for study. Not only can the varieties and quantities of ornaments be analyzed, but the large sample size of many types of perforated artifacts means that measurements could be collected and descriptive statistics presented. Both quantitative and qualitative data reveal complex and negotiated identity of the local elite.

A total of 3,583 perforated ornaments are the subject of this study (Figure 5). The artifacts were individually cataloged with the exception of tiny shell beads which were subsampled and degraded plaques which were counted but not otherwise assessed. The objects were measured using a

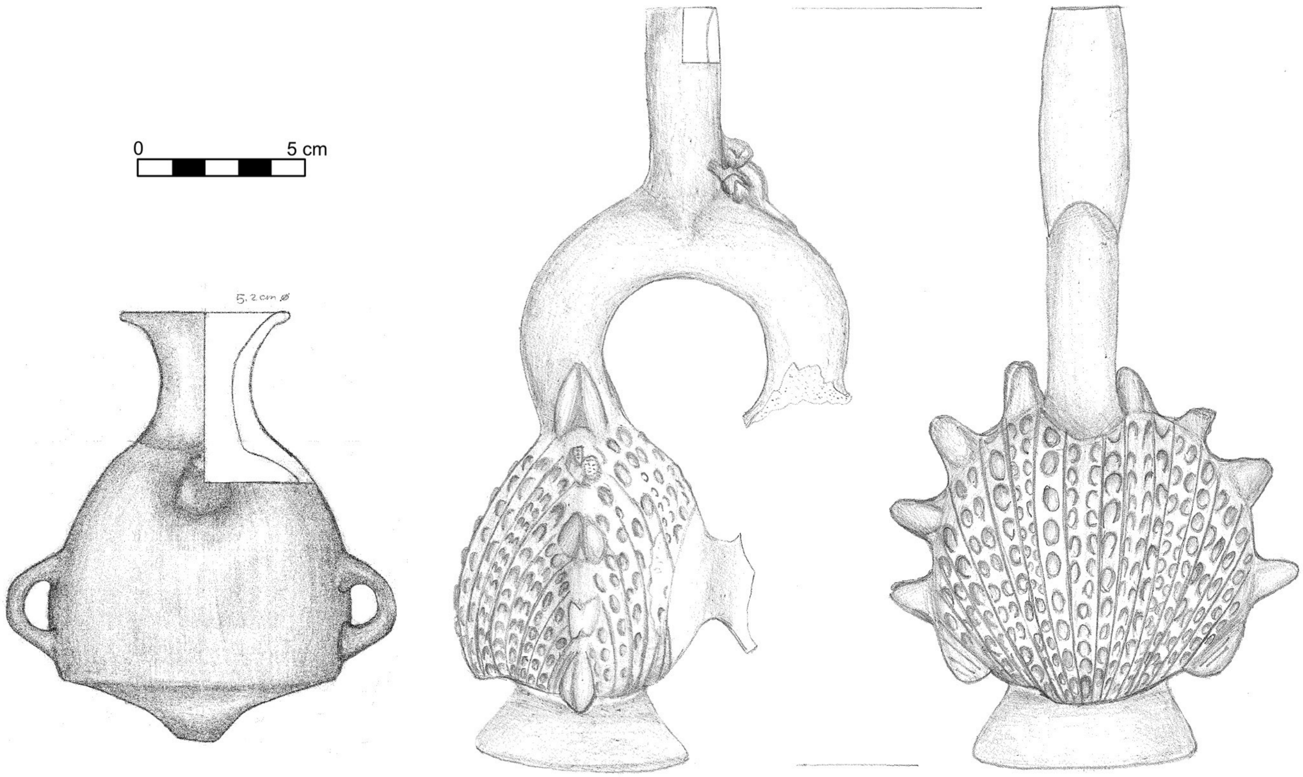

Figure 4. Chimú-Inka vessels from Samanco including an aryballo and a stirrup-spout bottle in the form of a Spondylus (drawing by Matthew Helmer).

Mitutoyo Digimatic six-inch digital caliper (Model CD-6"C) attached directly to a PC laptop using a Mitutoyo USB Input Tool (06ADV380C). These tools minimize error associated with the transcription of hand-written to digital data. Coloration, material, form, perforation form, production marks, and use wear were assessed using a handheld lens and a PC-connected DinoLite digital microscope (413T) with 20x-230x magnification via Dinocapture 2.0. Photographs were collected using a Canon SX 50-HS digital camera. All photographs included a scale and, therefore, when necessary (e.g., for strung beads) measurements could be taken from the photos calibrated using ImageJ, an open source program for digital calibration and measurement.

Beads

Beads were the most numerous artifact encountered with the burials, attesting to their cultural significance for the Chimú-Inka dead. As an artifact category, beads are centrally and/or longitudinally perforated artifacts used for decoration and, while they tend to be cylindrical or spherical, there are many possible forms (for greater detail, *see* Beck 1928; Dubin 2009:362-363). Beads were measured and categorized according to color, form, and form of the perforation (Figure 6). Evidence of production and use wear was also recorded (Allen et al. 1997; Carter 2008; Masucci 1995). A total of 3,357 beads were sampled, including 3,256 chaquiras (small beads), 83 large beads, 7 organic beads, 6 copper beads, 3 *torteros* (spindle whorls), 1 ceramic spacer bead, and 1 possible ceramic bead (Figure 7). Each type of bead required slightly different analytical protocols.

Because they are both numerous and relatively standardized, once separated by color and counted, unstrung chaquiras were subsampled. A representative sample of 20% of each color, rounded to the nearest ten, was selected. Any subsample that contained less than 40 beads was increased to 40 or, if n < 40, fully analyzed. A total of 706 chaquiras (21.9%) were fully analyzed (Table 1).

For all beads, at least three dimensions were measured: diameter; length (the distance between the two faces which, for cylindrical beads especially, may be called thickness; e.g., Carter 2008); and exterior perforation diameter (Figure 8); Tables 1-2). For chaquira, each bead was measured once. Measurements were doubled for the larger, more variable beads (Table 2; cf., Carter 2008:295-297). Strung chaquira could not be measured with calipers because they adhered to one another and the preserved organic fibers (Figure 9). Photographs and scaled photomicrographs were calibrated

Figure 5. All the perforated ornaments from the Chimú-Inka tomb at Samanco (photo by Matthew Helmer).

and measured with ImageJ. Chaquiras of stone and shell are very similar in size (Table 1); although not statistically significant, stone beads are a bit smaller than those of shell. Large beads are significantly bigger (Table 2).

Chimú-Inka elite employed diverse colors to ornament their bodies that provide grounds for classification and identification of the raw material. Chaquiras are the most diverse beads in terms of color with the following being recorded: black, translucent brown, dark opaque brown, green, reddish orange, white, red, pink, purple, and dark. Differentiating the first five colors is easy because these beads are made of different types of stone and, therefore, texture aids in classification. Texture is less useful for shell beads which are categorized according to color only. This necessitates additional explication. "White" beads range from brilliant white to light gray to light tan; all other colors are absent. "Red" beads include bright red, reddish orange, or reddish purple, but frequently contain some, and often much, white as well. "Pink" beads are white with muted pink streaks. Though not initially employed, "purple" was added for one bead that lacked any red. Beads categorized as "dark" are a muted gray to grayish brown, likely due to deterioration. They tend to be chalky and more fragile than the other shell beads.

Due to differences in material, large beads were separated using slightly different color categories. While a wide variety of colors were recorded initially, because certain colors are clearly from the same material and are difficult to separate analytically, they have been aggregated. These color categories include blue (including deep blue, gray blue, and dark gray blue), brown (translucent brown and dark opaque brown), turquoise (mottled turquoise, mottled bright green, and dark gray green) and translucent (includes pale translucent purple and pale translucent tan).

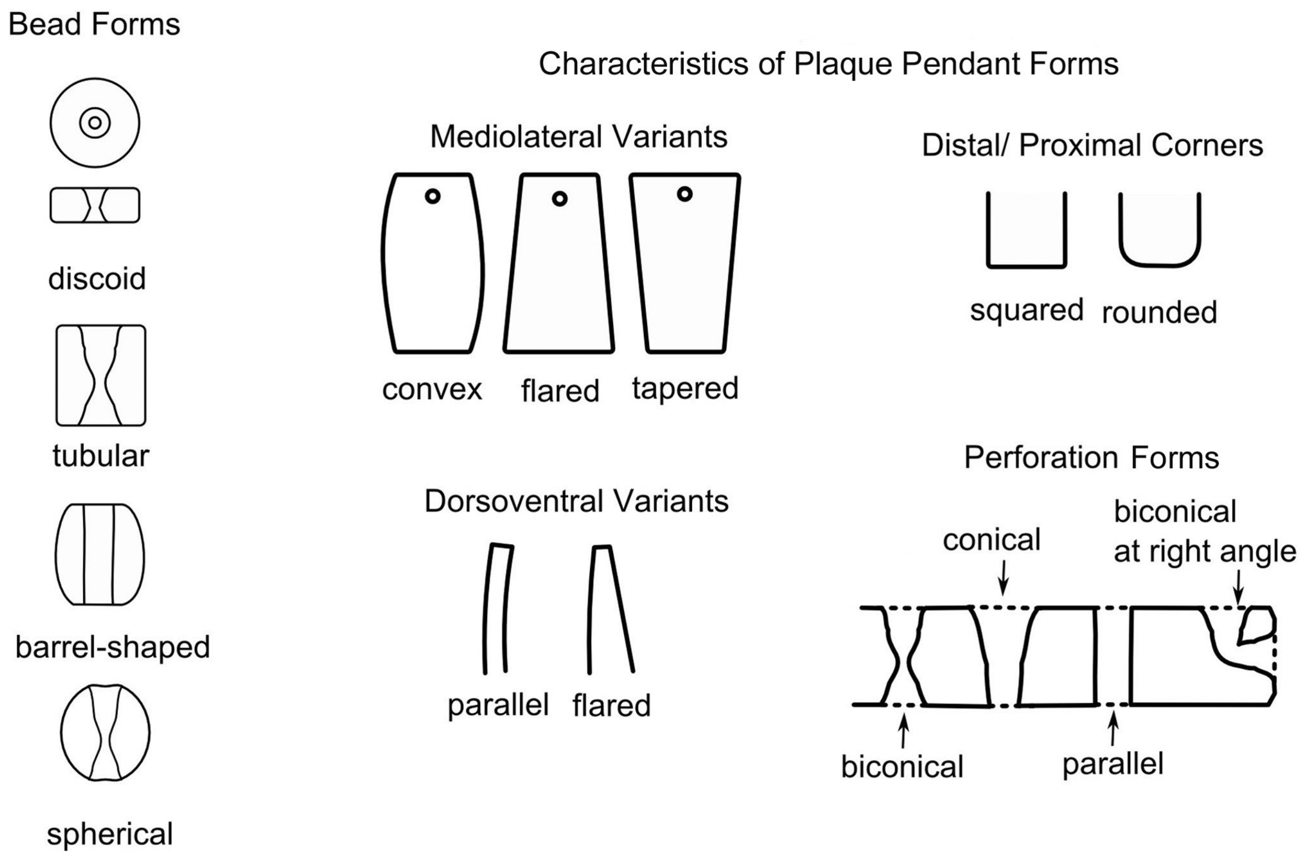

Figure 6. Bead forms and plaque pendant characteristics (drawing by Benjamin Carter).

Figure 7. Barrel-shaped shell beads (top row), ishpingo seed beads (middle row), ceramic spacer bead (middle row at right), possible stone *torteros* (three at lower left), and possible large ceramic bead (lower right) (photo by Benjamin Carter).

Table 1. Summary of Counts and Measurements for Chaquira by Color.

	Total	Measured	Diameter				Length				Perforation Diameter			
			m	std	min	max	m	std	min	max	m	std	min	max
Shell														
Dark	116	40	3.34	0.82	2.20	6.00	1.56	0.45	0.74	2.67	1.44	0.28	0.76	2.03
Pink	775	160	3.46	0.86	2.17	5.79	1.47	0.48	0.59	2.87	1.32	0.36	0.58	2.27
Purple	1	1	2.60	-	-	-	1.75	-	-	-	0.75	-	-	-
Red	867	179	2.97	0.57	1.81	5.92	1.32	0.34	0.66	2.55	1.10	0.28	0.56	2.01
White	639	161	2.88	0.62	1.62	5.56	1.47	0.42	0.73	2.92	1.22	0.30	0.50	2.00
Strung white	31	31	3.03	0.51	2.10	4.40	1.35	0.34	0.90	2.10	-	-	-	-
Stone														
Black	751	180	2.70	0.32	1.69	3.60	1.44	0.31	0.60	2.73	0.83	0.14	0.52	1.42
Strung black	30	30	2.60	0.44	1.90	3.60	1.45	0.31	0.60	2.00	-	-	-	-
Brown	37	37	3.06	0.36	2.50	3.72	1.71	0.38	0.95	2.60	0.90	0.16	0.39	1.23
Green	4	4	2.20	0.14	1.99	2.32	1.33	0.23	1.09	1.61	0.77	0.13	0.63	0.88
Red orange	5	5	3.27	0.50	3.00	4.16	1.45	0.63	0.76	2.27	0.78	0.19	0.54	1.03
All Colors	3256	767	3.01	0.67	1.62	6.00	1.44	0.40	0.59	2.92	1.12	0.34	0.39	2.27

Measurements are in millimeters; m = mean, std = standard deviation, min = minimum, max = maximum.

Table 2. Summary of Counts and Measurements for Larger Beads by Color.

	Total	Diameter					Length					Perforation Diameter				
		m	std	min	max	diff	m	std	min	max	diff	m	std	min	max	diff
Shell																
Purple	2	9.30	0.10	9.23	9.37	-	10.76	0.09	10.69	10.82	-	2.80	0.30	2.58	3.01	-
White	6	7.66	1.44	5.51	9.22	-	9.48	0.98	8.27	10.65	-	3.22	0.58	2.43	3.73	-
Stone																
Blue	53	7.22	1.63	2.88	11.89	0.27	3.60	2.38	1.72	14.03	0.39	2.25	0.43	1.55	3.42	0.43
Olive green	2	6.36	0.37	6.10	6.63	-	4.22	3.55	1.71	6.74	-	2.12	0.11	2.04	2.19	-
Translucent	15	11.08	4.35	6.23	21.70	1.34	8.52	3.89	3.77	15.56	0.61	3.83	1.95	2.09	9.57	1.94
Turquoise	5	7.28	0.78	6.12	8.07	-	2.36	0.68	1.52	3.05	-	1.74	0.52	1.27	2.64	-
All Colors	83	7.98	2.71	2.88	21.70		5.03	3.56	1.52	15.56		2.59	1.11	1.27	9.57	

Measurements are in millimeters; m = mean, std = standard deviation, min = minimum, max = maximum, diff = the difference between two measurements of the same dimension.

Beads come in a wide variety of forms, including discoid, tubular, barrel-shaped, spherical, and other (Figure 6). These terms are generally consistent with those used in Beck's (1928) classic, "Classification and Nomenclature of

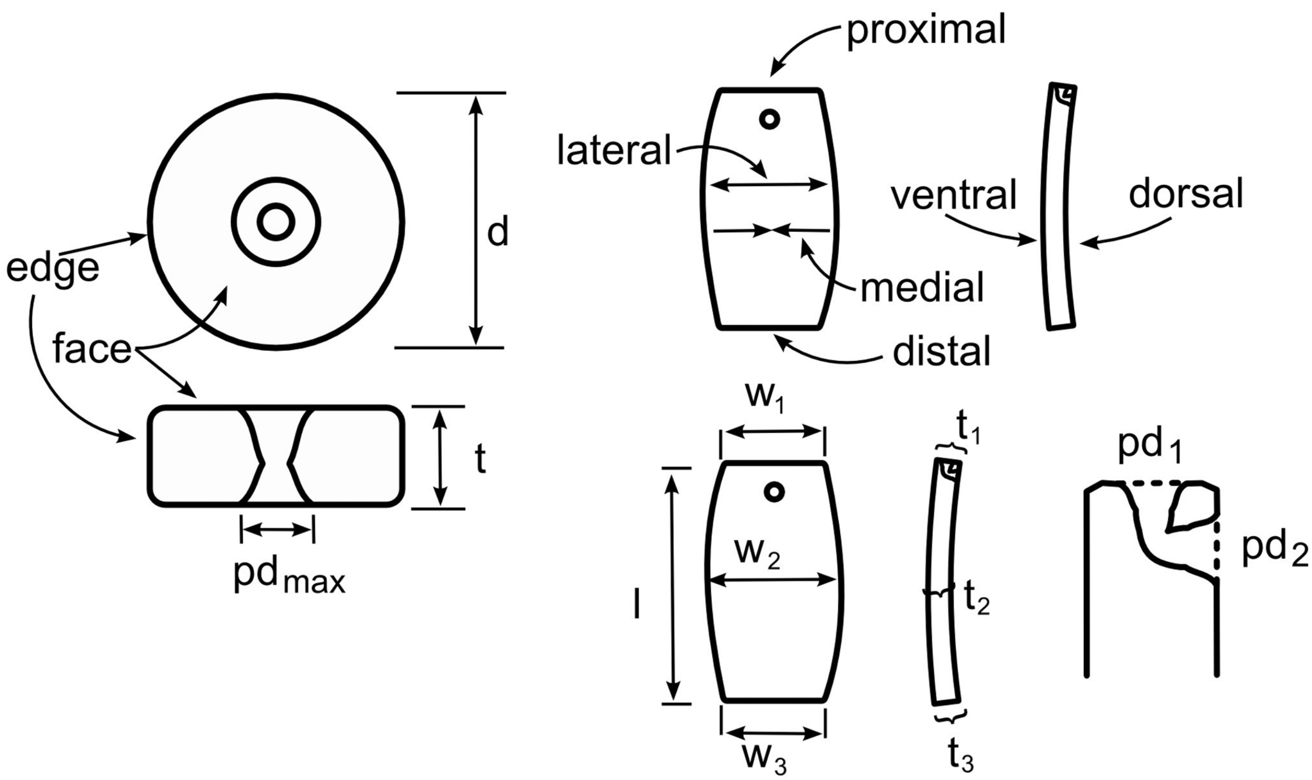

Figure 8. Bead and plaque pendant attributes (drawing by Benjamin Carter).

Beads and Pendants." Note that the term cylinder is used as a broad category for all beads that are circular with flat faces and parallel edges, including discoid and tubular beads.

Discoid beads (Beck's cylinder disk or annular) are round with two flat, parallel, and perforated faces. The sides are perpendicular to the face and parallel to each other. There is a slightly rounded right angle where the side meets the face. Discoid beads have a diameter greater than their length. All chaquira are discoid. Discoid beads form the majority of all artifacts (n = 3,293 or 91.9% of the assemblage).

Figure 9. Chaquira on cordage from Samanco (photo by Benjamin Carter).

Tubular (Beck's cylinder or tube) beads are the same as discoid beads except that their length (or thickness) is greater than their diameter. Only seven tubular beads are present in the collection: one of shell and six of stone.

Barrel-shaped (Beck's barrel) (Figure 7) beads are similar to tubular beads in that they tend to be long and have two flat faces, but have convex instead of parallel sides. Bernier (2010a:94-95) calls these "elliptical." They tend to be larger than discoid or tubular beads. Most barrel-shaped beads, whether stone or shell, are purple, white, or clear.

Spherical beads (Beck's circular or ellipsoid) are similar to barrel-shaped beads but without faces. They tend to be elongated along the axis of the perforation; i.e., slightly ovoid or ellipsoid instead of truly spherical. All spherical beads are translucent and made from quartz/amethyst.

Degree of completeness is recorded using three categories: 100% complete, between 100% and 50% complete, and less than 50% complete (Carter 2008). Unlike at production sites where a large portion of beads are fragmented (Carter 2008; Currie 1995), only 13 beads were less than 100% complete at Samanco, suggesting excellent preservation and minimal effect on the chaquira collection by looters. Therefore, it can be established that these beads are far removed from their production context and consistent with worn adornment.

Shell Beads

Since Spondylus is one of the most discussed mollusks in Andean prehistory (e.g., Carter 2011; Cordy-Collins 1990; Marcos 1977; Masucci 1995; Paulsen 1974; Pillsbury 1996), accurate identification is particularly important. Two characteristics may be used to distinguish Spondylus from other shell: color and texture. A third variable, size, limits the usefulness of the first two. Shell artifacts exhibiting the colors red, orange, and purple[1] are likely made from Spondylus, but some other taxa, such as *Chama* sp. (e.g., Masucci 1995), can also be these colors. The texture of Spondylus is distinctive, however; the exterior layer of shell is a dense foliated calcite colored red, orange, and purple (Figure 10) while the interior layer is a white crossed-lamellar and/or prismatic aragonite (Carter 1990:388-389; Logan 1974:571-572; Waller and Yochelson 1978:354). On the exterior, red, orange, purple, and white radial lines are frequently found extending from the umbo. Therefore, colored Spondylus artifacts tend to have variable streaks of color that follow the foliated calcite.

Even when one takes into consideration color and texture, positive identification is limited by the size of the artifact or shell fragment. Because Spondylus develops thicker shell than most other mollusks, it is very unlikely that the larger colored plaques derived from any other mollusk. Conversely, the size of the tiniest beads means that one can be less definitive about their taxonomic origins. Still, considering that whole and partial shells of Spondylus have been recovered from shell artifact workshops in Latin America and elsewhere (e.g., Allan 1989; Allen et al. 1997; Carter 2008, 2011; Feinman and Nicholas 1993; Mayo and Cooke 2005; Moholy-Nagy 1989), there is relatively little doubt that many of the tiny chaquiras came from this shellfish. The red-orange stone beads, though easily distinguished from shell beads, provide a note of caution: not all that is red is Spondylus (for further precautions about the identification of Spondylus, *see* Blower 1995, 2000). We conclude that while the larger artifacts with red, orange, or purple are clearly Spondylus, for the smaller artifacts, especially the chaquiras, it is difficult to be definitive even though we consider it highly likely that chaquira with these colors are Spondylus because many appear to have a foliated texture. Pink chaquiras could be from a number of different species, including Spondylus. The white may be from the aragonite layers of Spondylus, but since it is very common in other shellfish, white beads could be from nearly any mollusk. Moore and Vilchez (2015) identify the raw material of white beads with a chalky surface as *Anadara* sp. but, in the Samanco assemblage, this chalky surface is present on larger artifacts, such as the degraded plaques that are clearly Spondylus. Therefore, we consider it likely that

Figure 10. Close-up of Spondylus chaquira showing foliated structure (photo by Benjamin Carter).

even the white beads were made from Spondylus, but cannot rule out *Anadara* sp. or other white-shelled mollusks.

Shell beads were made using the heishi technique which has been documented throughout the world (Allen et al. 1997; Blick et al. 2010; Carter 2008; Foreman 1978; Francis 1982, 1989; Holley 1995; Kenoyer 1984; Malinowski 1922; Masucci 1995; Mester 1990; Moholy-Nagy 1989; Yerkes 1983). Generally, this process includes four stages. First, the shell is broken into fragments slightly larger than the intended bead. Normally, this is done through direct percussion, but some blanks may have been cut from the shell. Second, the bead is ground on an abrasive surface (e.g., sandstone) to better approximate the size and shape of the intended bead. The result is normally a faceted disk. The bead is then perforated using a drill with a bit that is frequently made from chert or another fine-grained durable stone but can also be made from durable organic materials (e.g., cactus spines) or copper. In order to perforate shell with organic or copper drills, abrasive powders and/or weak organic acids (e.g., lime juice or urine) may be used to aid in the drilling process (Miller 1996). Once perforated, the beads are strung together and rubbed across an abrasive surface. To do this, the strung beads are held tightly together so that they form a long, irregular cylinder that is rolled across the surface while also being pulled perpendicular to the string. This rounds the edges of the beads leaving them similarly sized.

Direct evidence of production is limited in the chaquiras from Samanco. Striations from grinding the face edges are absent on most beads, but this may be due to use. Regular or frequent wearing of the beads would result in polished faces from rubbing against neighboring beads and polished edges from rubbing against clothing, skin, or other ornaments. The identification of the production technique therefore comes largely from the similarity of the Samanco beads to those from production locales (e.g., Carter 2008). The perforations of some beads are biconical, indicating they were drilled from both faces. Perforations with parallel sides may indicate a different perforation method or wear from the abrasive fibers upon which they were strung. The larger barrel-shaped beads have some facets on their faces suggesting that they were individually abraded by hand to achieve the barrel shape, not using the rotary method discussed above. Based on an extensive review of the literature, Carter (2011) suggests that chaquira production is limited to extreme northwestern Peru (*see also* Moore and Vilchez 2015), the coast of Ecuador, and a few small areas farther north. This is also the southern limit of the natural range of Spondylus, the shell from which so many chaquiras were produced. Chaquiras, therefore, were most likely produced on the Ecuadorian and extreme northern Peruvian coasts and exchanged southward, eventually to be used by the Samanco Chimú-Inka.

Stone Beads

While a variety of stone material was used for perforated ornaments, chaquiras and larger beads were made from different stone. Stone chaquiras were fashioned from turquoise, as well as green, red/orange, and black stone. Larger beads were made from turquoise, sodalite, and quartz/amethyst. It must be noted, however, that the identification of the parent material of these artifacts based upon color and texture is not ideal. For example, many of the minerals that Petersen (2010: Chapter 1) describes have overlapping colors. He states, “samples identified in archaeological samples as turquoise, topaz, lapis lazuli, and rose quartz may actually be chrysocolla, jade, citrine, dumortierite, garnet, sodalite, fluorite, or other possibilities” (Petersen 2010:3; *see also* Shimada 2013). Physical, elemental, or mineralogical analysis could be used for a more precise identification. All identifications herein are based only upon visual (macro- and microscopic) characteristics and, therefore, should be considered preliminary.

Stone chaquiras are similar in size and shape to the shell chaquiras (Table 1). It is, therefore, quite likely that they were also produced using the heishi technique, but because few production marks are present, this is difficult to state definitively. Comprising 23.1% (751/3,256) of the chaquira assemblage, black stone is one of the most common materials used for these small beads (Table 1). The identification of this material is uncertain. It does not appear to be common at other archaeological sites, though Moore (2010:413) describes “one or more strands of very small beads made from an unidentified black stone” from a Chimú-Inka-period tomb at Santa Rosa on the far north coast of Peru, and Donnan and Stilton (2010:16) recovered three stone (slate?) beads. These may be the same material used to make stone beads at Moche that Hélène Bernier (1999:26, 2010b) describes as a soft (ca. 2.5 on the Mohs hardness scale), gray or beige, “steatite-like local stone” from the Moche period deposits at Huacas de Moche. Beads were likely produced within the household. Evidence of production includes “blanks, cutting debris, beads, and pendants broken in the process of manufacture, as well as finished adornments” along with tools, including “copper needles and awls, polishers, blades, and grinding stones” (Bernier 2010b:98; *see also* Bernier 1999). Evidence suggests that the Moche used a technique similar to the heishi technique, but it is unclear how Moche beads were drilled since no lithic microdrills have been recovered. The edges of the perforations in some of the long (ca. 1 cm) broken beads (Bernier 2010b: Figure 5; *see also* Bernier 2010a: Figure 6) are incredibly parallel, a characteristic difficult to achieve with lithic drills, but easier with metallic drills (e.g., Kenoyer 2003).

The black stone from Samanco is unusual. The interior, as seen in broken beads, contains large crystals, but the exterior is a smooth glossy black without visible crystals (Figure 11). On the faces of a few beads, the exterior appears to be a distinct layer that looks much like glaze on ceramic. Glazes, however, were not used in Andean South America. Furthermore, known ceramic chaquiras, common on the Ecuadorian coast (e.g., Cabada 1989; Carter 2008), are manufactured in a distinct manner and do not look like the Samanco beads. The beads, therefore, are likely stone, but with a hardened exterior. What process – natural or anthropogenic – could have produced this is unclear, but heating is a possibility.

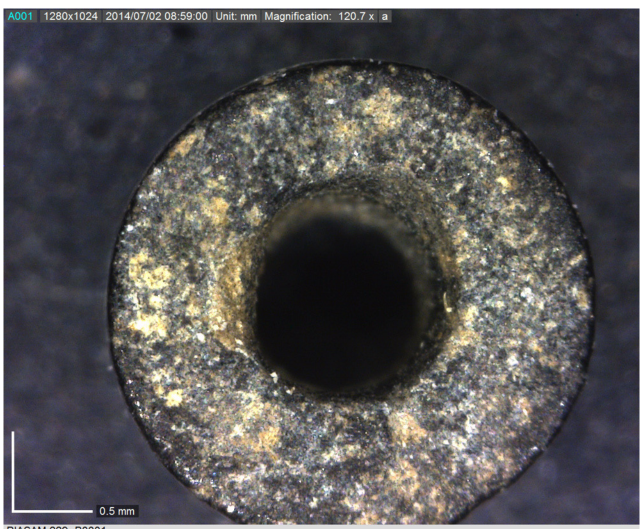

Figure 11. Close-up of black chaquira (photo by Benjamin Carter).

The rest of the stone chaquiras comprise a minor proportion of the assemblage (46/3257 or 1.4%) (Table 1). The material used for the brown stone beads is also difficult to identify; it may not even be stone. It is heavier than shell and a distinct shiny medium brown. It is possible that these beads are made from brown/tan shell where the muscle attaches in bivalves; the “aragonitic prismatic adductor myostracal layer” (Logan 1974:572). This portion of the shell is harder and denser than much of the rest and is frequently a darker tan or brown, especially in Spondylus (Skoglund and Mulliner 1996). Some of the brown beads also have dark irregular streaks that are unlike streaks in Spondylus shell, possibly suggesting a terrestrial origin. Green stone beads, which are likely a variant of turquoise, also comprise a minor component. If it is turquoise, it was likely drilled with lithic microdrills. Otherwise, there are only minor production marks remaining that suggest a process similar to the heishi technique.

Red stone beads may be important because their coloration is similar to Spondylus (*see* Chapdelaine et al. 2004:75). Upon close inspection, these “red” beads are a darker and richer red mottled with dark brown or black patches and, therefore, unlike the red of Spondylus. This suggests that the color of the bead may have been more important than the parent material. Are these beads imitation Spondylus chaquiras? Were they easier to manufacture and obtain? It is possible that local stone (red stone may be found at numerous locations along the hills that border the Nepeña Valley) was used as a replacement for Spondylus that came from a much greater distance. The material may also be a type of steatite (Bernier 2010b). Of course, the limited number of these beads (n = 4) suggests that, if they are imitation Spondylus, they did not contribute greatly to elite dress. An important question is whether or not red stone beads were employed by those lower in the local hierarchy.

Nearly all the large beads (75/83 or 90%) are made of stone and the majority of these are sodalite (53/75 or 71%) (Figure 12). Sodalite beads are more variable than the chaquiras and include different forms, production processes, and sizes. Three are cylindrical, while the others are discoid. Many of the corners (i.e., the interface between the face and the edge) of the larger beads are irregularly faceted and rounded. This clearly indicates that the larger beads were made individually, not en-masse as in the final stage of production of chaquiras by the heishi technique. The dimensions of sodalite bead are, therefore, quite variable. Discoid bead diameters range from 2.9 to 11.8 mm with a length of 1.5-5.1 mm, while cylindrical beads are much thicker/longer (11.2-14.0 mm). Two measurements were recorded on sodalite and quartz/amethyst beads for diameter, perforation diameter, and length. On average, beads from these two materials are highly variable. For example, the average difference between the two diameter measurements for sodalite (0.27 mm) and quartz/amethyst (1.34 mm) is much greater (0.15 mm; N = 2968) than for the finished chaquiras studied by Carter (2008: Table 8-4).

Sodalite beads represent a significant investment of time largely because the material is more difficult to work (Mohs hardness of 5.5-6; shell is 3-4). The sources of sodalite are difficult to pinpoint, but it was widely used in prehistory and, like turquoise and chrysocolla, likely originated from cupriferous deposits in Peru, Chile, or Bolivia (e.g., Gijseghem et al. 2013). Although Chile and Peru are currently the top producers of copper in the world

Figure 12. Sodalite beads from Samanco (photo by Benjamin Carter).

(Bebbington and Bury 2009) and deposits are widespread, sources of semi-precious gemstones, such as sodalite, would have been highly localized. Knowledge of these localized deposits is limited.

Quartz and amethyst beads comprise 15% (14/83) of the large-bead assemblage and are unusually irregular (Figure 13). Nearly all are spherical or roughly spherical (12/15 or 80%), a form not used for other materials. Of the three non-spherical beads, only one is of a form (barrel) used for other materials and the other two are curious variations on common forms: rectangular barrel and irregular cylinder. Four of the largest translucent beads are perforated in a distinct manner (for a Chavín example, *see* Dubin 2009:253). Instead of bearing the concentric rings left by a spinning drill, perforations are wider at the opening, rough, and pitted (e.g., the upper left bead in Figure 13). They appear to have been pecked, a rare but not unknown method of perforation (e.g., Kenoyer 2003:16). The beads are also faceted, but no striations remain from grinding and the intersections of facets are highly rounded.

The irregularity of the bead forms, the need for pecked perforations, and the rounded facets all suggest that artisans took advantage of natural shapes and used any technique available to them (pecking in this case) to craft the beads. They did not necessarily aim for a particular form as a finished product, but appear to have focused on rounding, color, and transparency. This is not surprising since quartz is the hardest material (Mohs 7) used for beads in the assemblage and it would have been very difficult to achieve a particular shape. Each quartz bead is a unique product of the combined elements of raw material shape, color, and artisan skill. Quartz is a local material commonly found as

Figure 13. Quartz and amethyst beads (photo by Benjamin Carter).

unworked chunks in refuse pits around Samanco. One of the main sources of quartz crystals is Mina Adán (Petersen 2010:3, 11), approximately 40 km south of Samanco. Quartz crystals from this mine are exceptional; they commonly measure 45 cm in length and 20 cm in diameter, with a weight of 15 kg (Tumialán de la Cruz 2003:361). Access to this source of highly variable and difficult-to-work material at a nearby locale would not have been lost on local elites.

The last group of larger stone beads is olive green (n = 2) and blue-green (n = 5) in color. The blue-green specimens are clearly turquoise which is a bright, semitransparent aquamarine to bluish green with veins of dark black or reddish brown. The raw material of the olive-green beads remains uncertain. They are dark, opaque, and consistent throughout. These beads are similar in size to those crafted from turquoise. Gorelick and Gwinnett (1994) studied turquoise beads from the famous Moche tombs of Sipán. Comparing the archaeological specimens to those drilled with lithic microdrills and those drilled with copper drills and an abrasive slurry, they found that production marks from lithic microdrills best matched the beads from the tombs. This suggests that lithic drills were used to perforate turquoise as well as shell. Yet, as Gorelick and Gwinnett (1994:179) state, "flint or chert drills have not been excavated, as yet, in Sipan." Nor have they been recovered at other Moche sites (Carter 2011). Although it is still not clear where the turquoise originated (e.g., Valdez 2008:885), sources exist in northern Chile (González and Westfall 2008; Salazar et al. 2013) and may exist in both southern and northern Peru (Ruppert 1983; Stöllner 2009:400; Stöllner et al. 2013). It is, therefore, unclear over what distance the turquoise may have been traded, but it was likely not a local material.

Copper Beads

The Samanco bead assemblage also contains seven copper specimens. These are of three different forms, including a four-pointed star (n = 5), bivalve (n = 1), and coiled wire (n = 1). The stars are rectangular sheets of copper ca. 20 mm across and < 1mm thick whose edges have been pinched inward to create a four-pointed form (Figure 14). By doing this, the center of one face was made convex and the opposite concave. The center exhibits two holes that were made by a cylindrical object such as a punch from the concave side. Evidence of twine is present on the concave face around both holes suggesting that the objects were strung.

The second type looks like a bivalve shell in that it is made from a bilobular sheet of copper, each half of which was shaped into a concave hemisphere. The sheet was then folded so the two halves face each other (Figure 14, upper center). The bead is approximately 10 mm wide, 8 mm long, and 7 mm thick. The sheet is < 1 mm thick and the perforation is ca. 1.5 mm in diameter.

The final copper bead consists of a wire tightly wound into a spiral form with a central passage for stringing (Figure 14, right). The reason this artifact is considered a bead is because a single chaquira is clearly encased in it. Presumably, the wire was wrapped around one or more of the chaquiras to form a compound bead. In addition to the perforated copper ornaments are three segments of wire, eleven globules, and one fragment of sheet copper.

Copper ornaments have a long history on the coast of Peru (e.g., Shimada et al. 2000) and there is little doubt that they were made in a coastal workshop.

Organic Beads

There are seven organic beads (Figure 7), all of which appear to be *ishpingo/espingo*, a category that includes a variety of beads (Eeckhout 2006). One of the most important is *Nectandra* sp. (Montoya Vera 1996, 1998, 1999) which appears to be derived from the Bolivian Amazon and, therefore, its presence on the coast is a result of long-distance trade. Montoya Vera (1999) argues that the alkaloids in *Nectandra* sp. may have been used as a narcotic during rituals, possibly contributing to a painless death during human sacrifice. *Nectandra* sp. beads tend to be associated with the Chimú (Cutright 2013; Eeckhout 2006; Montoya Vera 1996, 1998; *see also* Klaus et al. 2010) and with women in particular (Carol Mackey 2015: pers. comm.). Eeckhout (2006) argues that ishpingo are part of a ceremonial complex not exclusively associated with burials. He adds that ishpingo and Spondylus are not found together. This is clearly not true at Samanco, nor in some Sicán/Lambeyeque (Klaus et al. 2010) and Chimú burials (Cutright 2013; Montoya Vera 1998). Eeckhout (2006) clearly articulates that although *Nectandra* sp. is used largely during the Late Intermediate period, it was used by different peoples in very different ways.

Ceramic Beads

Ceramic beads (Figure 7) are represented by a three-hole spacer and possibly a large roughly disk-shaped form. The latter is unlike most other ceramic beads (e.g., Cabada 1989) and it is unclear if this is a bead. It is included to ensure full documentation.

Torteros

Although their primary use may have been in textile production, three possible *torteros* (spindle whorls) made of

Figure 14. The copper beads and other copper artifacts from Samanco (photo by Benjamin Carter).

stone (Figure 7, bottom row) are included here because they were found with the beads and could also have been strung and worn like them. They are made from a shiny black stone (1) and a speckled gray one (2). Many burials have documented *torteros* as part of weaving kits, however. The forms vary, but they differ from beads in that the perforation is much larger than those of other beads, averaging slightly less than 5 mm.

Pendants

Pendants are elongated artifacts perforated at one end or edge allowing them to be strung, and each one contains a greater amount of raw material than a chaquira. All the Samanco pendants are made of shell and fall into two major categories: those made from portions of shells and those made from whole shells.

Plaque Pendants

Pendants made from shell segments are roughly rectangular or trapezoidal, a form frequently termed "plaque" (Figure 15). Only a representative sample of well-preserved plaques was fully analyzed. Originally, plaque pendants were separated by the excavators into two groups: large (N = 246) and small (N = 68). Many of the larger plaques were so deteriorated that any color assessment or measurement would have provided an inaccurate representation of the original artifact (e.g., Figure 15a, plaque at the right). Nevertheless, because the deteriorated plaques appear very similar in shape and size to the larger Spondylus pendants discussed below, the measured plaques likely represent the deteriorated ones as well. Ninety-nine deteriorated large plaques were not measured, while 147 large plaques and all 68 small plaques were fully analyzed (Tables 3-4).

Plaques are described using directional terms (Figures 6, 8). Proximal is defined as the perforated end and distal is the opposite end. Medial is toward the axis running down the center of the object from the proximal to the distal end while lateral is away from this axis. Ventral is towards the front of the object. This may be identified by three traits: the ventral side tends to be unperforated, has more coloration (especially red), and is convex. Dorsal is towards the back and is always perforated, frequently whiter, and may be concave. For a minority of plaques, ventral may be indistinguishable from dorsal because they are flat, perforated dorsoventrally, and have similar coloration on both sides.

Five characteristics are used to describe plaque pendants (Figure 6): 1) the shape of the lateral margins, 2) dorsoventral thickness, 3) finishing of the distal corners, 4) finishing of the proximal corners, and 5) the arrangement of the perforations. Lateral margins (Figure 8) may be convex (wider at the midpoint than at the proximal or distal ends: $w_1 < w_2 > w_3$), flared (wider distally: $w_1 < w_2 < w_3$), or tapered (wider proximally: $w_1 > w_2 > w_3$). Dorsoventral

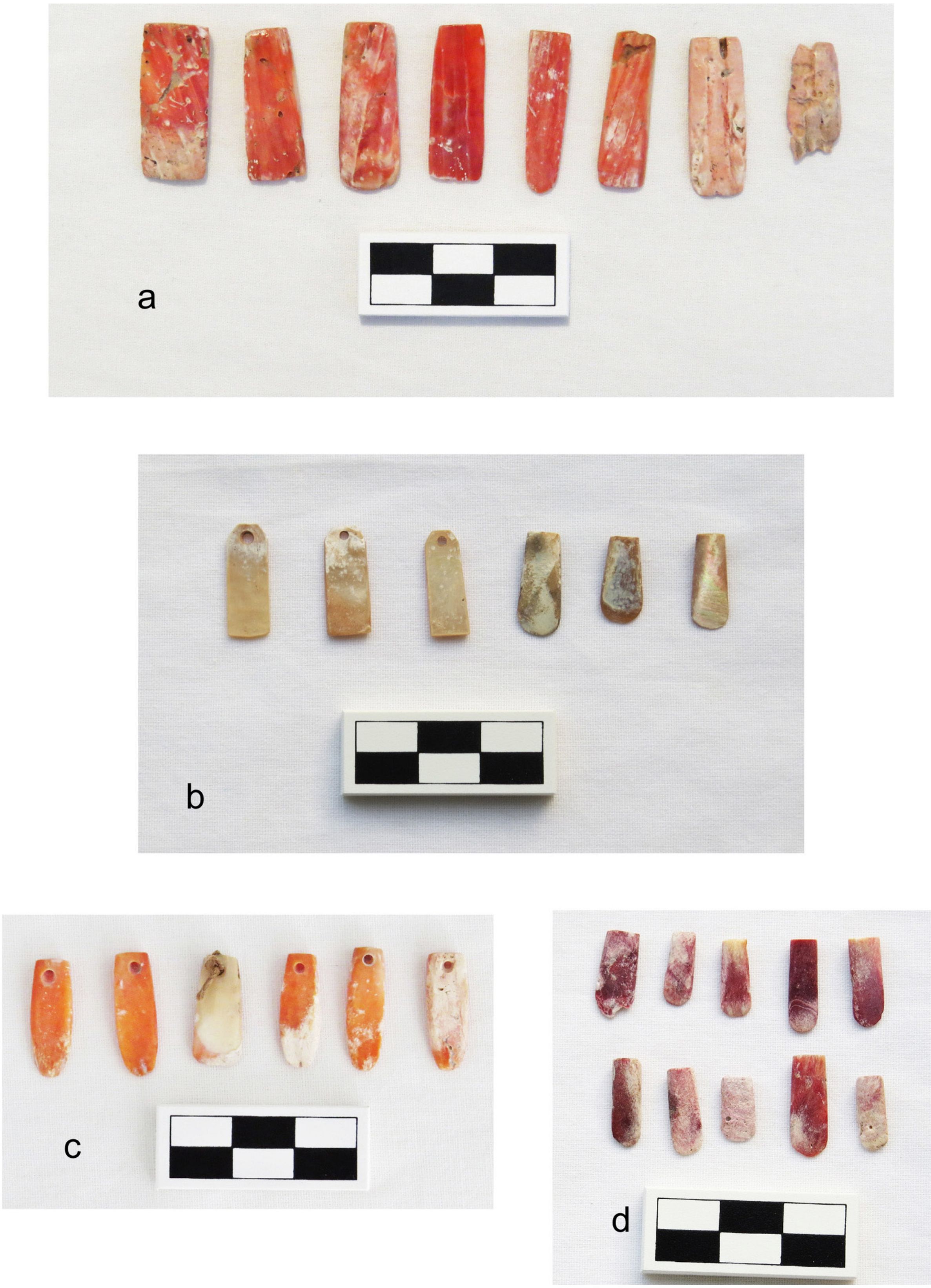

Figure 15. Plaque pendants from Samanco: a) red, b) iridescent, c) orange, and d) purple (photo by Benjamin Carter).

Table 3. Plaque Pendant Forms by Color.

Form				Color								Total
Distal Corner	**Prox. Corner**	**Dorso-ventral**	**Med./ Lateral**	**Irides-cent**	**Orange**	**Purple**	**Pink**	**Red**	**Red/Orange/ White**	**Red/Purple/ White**	**Red/ White**	
Rounded	Squared	Equal	Convex		1							1
Rounded	Squared	Tapered	Convex	4	5	2	9	1	63	4	10	98
Rounded	Squared	Tapered	Flared	14	1	8	10		41	1	2	77
Rounded	Squared	Tapered	Pointed				1		3	1		5
Squared	Rounded	Equal	Convex	16								16
Squared	Rounded	Equal	Flared	15								15
Squared	Rounded	Equal	Pointed	3								3
Total				52	7	10	20	1	107	6	12	215

Table 4. Summary of Frequency and Measurements of Plaque Pendants by Color.

Color	N	Length				Width				Thickness			
		m	**std**	**min**	**max**	**m**	**std**	**min**	**max**	**m**	**std**	**min**	**max**
Iridescent	52	16.09	2.22	11.25	18.85	6.05	0.81	4.18	7.56	1.53	0.40	0.82	2.42
Orange	7	20.28	2.59	17.99	25.83	6.57	0.82	5.71	8.13	3.00	0.33	2.68	3.62
Purple	10	13.61	1.76	10.51	16.49	5.06	0.55	4.42	6.08	1.96	0.22	1.48	2.36
Pink	20	26.00	1.67	22.59	28.17	9.30	0.97	7.81	11.52	3.33	0.33	2.72	3.84
Red	1	25.67	-	25.67	25.67	8.53	-	8.53	8.53	2.59	-	2.59	2.59
Red/orange/white	107	25.31	1.96	19.16	28.52	8.60	0.95	6.21	10.92	3.25	0.38	2.27	4.26
Red/purple/white	6	26.30	1.78	24.15	28.31	9.41	0.89	8.35	10.75	2.88	0.27	2.67	3.37
Red/white	12	25.08	1.89	21.69	27.88	8.97	0.89	7.21	10.14	3.43	0.36	2.93	4.05
All Colors	215	22.54	4.83	10.51	28.52	7.86	1.62	4.18	11.52	2.77	0.84	0.82	4.26

Measurements are in millimeters; m = mean, std = standard deviation, min = minimum, max = maximum.

thickness may be equal throughout the artifact ($t_1 = t_2 = t_3$) or taper towards the distal end ($t_1 < t_2 < t_3$). Distal and proximal corners may be square or rounded (Table 3).

A perforation may consist of two conical holes perpendicular to one another; one in the proximal surface of the pendant and another in the dorsal, known as dorsal/proximal. Or they may be biconical and aligned ventral to dorsal. All the perforations of the first type are biconical, as are many of the second type. Because the pendants were strung (a few retain cordage), the absence of a biconical perforation suggests that the perforations have been worn through use and may have originally been perforated biconically. Based on the presence of twine in three of the perforations (e.g., Figure 15c), they were clearly strung and likely knotted on the dorsal side. Pendant forms show a distinct pattern (Table 3; cf. Figure 15b to 15a, d).

The color of the plaque pendants was recorded to include the greatest amount of information and, because plaques are much larger than chaquiras, in a manner different than for beads. Each artifact was coded with as many of the following codes as was appropriate: r (red), o (orange), p (purple), w (white), ir (iridescent), and pink (pink) (*see*

Carter 2008: Chapter 4 for a discussion of the use of this method for chaquiras as well). For example, a pendant containing red, purple, and white was coded as rpw. This is different from the technique used for chaquiras for which a "red" bead may also contain orange, purple, or white. As previously mentioned, artifacts containing red, orange, and purple are likely manufactured from Spondylus, while the iridescent artifacts are certainly mother-of-pearl (*Pinctada mazatlantica* or *Pteria sterna*).

For each analyzed plaque, nine measurements were recorded, including one length, three medial-lateral widths, three ventral-dorsal thicknesses, and two perforation diameters (Figure 8; Table 4). Width and thickness were recorded at the proximal end, the midpoint, and the distal end. Where the distal end was rounded, the measurement was recorded proximal to the curve. These dimensions were recorded to obtain a width measurement, as well as to demonstrate numerically the forms discussed above. The maximum diameter of both perforations, whether perpendicular or aligned, was measured.

Plaque pendants were fashioned from two materials: Spondylus and mother-of-pearl. The production sequence for plaque pendants, while long posited, has recently seen definitive evidence. Shimada and Samillán Torres (2008) present clear evidence of the production sequence of plaques (*see also* Shimada 1994). A shell artisan, unearthed at the Inka administrative center of La Viña in the Lambeyeque Valley, north coast of Peru, was interred with the tools, in-process artifacts, and finished objects that allow the detailed reconstruction of the production process of a wide variety of artifacts, including plaques. Spondylus shells were ground initially to remove spines from the exterior surface into which lines extending from the distal edge towards the umbo were carved using saws made of hard, dark grey, fine-grained sandstone and slate. The semi-triangular sections were incised to form trapezoidal or rectangular plaques which were then snapped apart. The plaques were carved into miniature figurines. Similar plaques were produced at Tumbes Viejo at about the same time (Moore and Vilchez 2015). Shimada recovered in-process Spondylus plaques from a workshop at the earlier site of Pampa Grande (Shimada 1994:213-216), suggesting that they had been made on the northern coast of Peru for many hundreds of years before the Inka invaded the coast. Similar plaques were also produced near the Chimú capital of Chan Chan (Iriarte 1978; Schaedel 1966). As Spondylus plaques were also fashioned on the Ecuadorian coast (Carter 2011), they appear to have been produced across a broad area that included much of coastal, and perhaps highland, South America. Unlike chaquiras, the production of which was limited to extreme northwestern Peru and coastal Ecuador, Spondylus plaque production was widespread. Mother-of-pearl plaques were produced on the Ecuadorian coast (Mester 1990; *see also* Bushnell 1951; Meggers 1966; Meggers and Evans 1965). Both Spondylus and mother-of-pearl plaques were frequently perforated and have been recovered from sites along the Andean coast and in the highlands in the form of large composite necklaces (Carter 2011).

Most pendants are rounded at the distal end, but squared at the proximal as well as tapered dorsoventrally and either convex or flared medially/laterally; 82% (176/215) of the analyzed pendants are included in this group (Table 3). The only major alternative form is distally squared, proximally rounded, dorsoventrally equal, and mediolaterally convex or flared. This includes 31 pendants (14% of analyzed pendants), all of which were iridescent and likely made from mother-of-pearl. Clearly this type of pendant could only be made from mother-of-pearl, although this material could be used for other types. Iridescent mother-of-pearl and orange and purple Spondylus pendants are also significantly smaller (< 7.5 mm in width and < 20 mm in length) than most other pendants (Table 4; Figure 16, cf. Figure 15a to 15 b-d). These patterns have not been recognized elsewhere, largely because bead and pendant metrics are rarely collected, much less reported.

Whole-Shell Pendants

As the largest and most modified artifacts, whole-shell pendants were the centerpieces of the Samanco jewelry assemblage. Six whole-shell pendants were recovered and analyzed. All were made of individual valves of *Spondylus princeps* (Figure 17). Length and width were recorded. Length was measured dorsally/ventrally from the umbo to the ventral edge of the shell along the axis of maximum growth. Width was measured anteriorly/posteriorly, approximately perpendicular to the length measurement. Spines, which frequently extend beyond the lip of the shell, were not included in the measurements. All six shells have two perforations near the umbo along a line perpendicular to the axis of maximum growth. They were likely used for stringing the shell on a necklace or as a pectoral. The maximum diameter of these perforations was measured. The exterior of the shells was heavily modified and striations created by grinding Nevertheless, five observations suggest were clear. In order to assess how these shells were modified, extensive notes and diagrams were recorded paying special attention to the location and direction of the striations.

The whole-shell Spondylus pendants have been worked extensively to make the shell smooth and shiny while retaining the essential essence of the shell – the spine. The

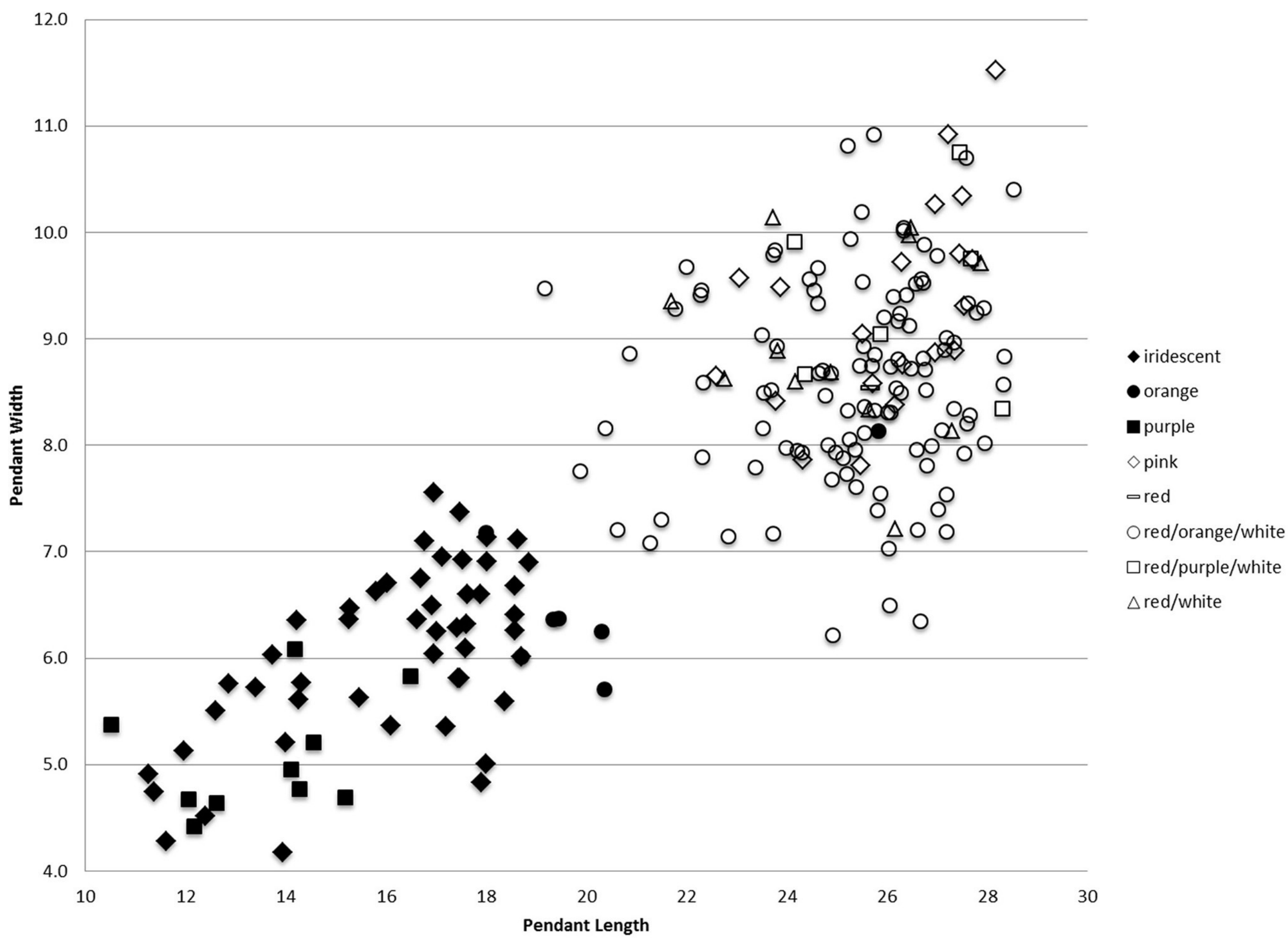

Figure 16. Plaque pendant length versus width by pendant color (graph by Benjamin Carter).

pendants appear to have been fashioned from *S. princeps*, rather than *S. leucacanthus* or *S. calcifer* (Coan et al. 2012; Skoglund and Mulliner 1996). Unlike *S. leucacanthus*, these shells are red to orange on the exterior, have wide color bands on the interior of the margins, and "spathate" spines instead of long and narrow ones (Coan et al. 2012; Skoglund and Mulliner 1996). *S. leucacanthus* would have been more difficult to harvest prehistorically because it lives at a depth of at least 18 m below the surface, while the other two are much more available (*S. princeps*: 3-28 m; *S. calcifer*: intertidal to 18 m) (Skoglund and Mulliner 1996: Table 2). It is more difficult to differentiate between *S. princeps* and *S. calcifer*. Although *S. princeps* has frequently been identified as red and *S. calcifer* as purple, taxonomists have described *S. princeps* as "dusty rose, purple with orange spines" (Skoglund and Mulliner 1996: Table 2) and "dusty rose with purple and orange spines" (Coan et al. 2012), while *S. calcifer* is "purple/orange, orange/yellow, all orange, all purple" (Skoglund and Mulliner 1996: Table 2) or "red-purple, yellow-orange, never white" (Coan et al. 2012). Therefore, color does not provide adequate analytical separation for definitive identification, but one could say that *S. princeps*, while including orange and purple, tends toward red and *S. calcifer*, while including red, tends towards the orange and purple. Nevertheless, five observations suggest that the whole-shell pendants are *S. princeps*. First, they are in the orange-red range of possible variation, more in line with *S. princeps*. Second, they are all approximately the size of *S. princeps* adults. Researchers indicate that the maximum size for *S. princeps* is between 130-143 mm, slightly more than half the size of *S. calcifer* adults which average 248 mm (Coan et al. 2012:311; Skoglund and Mulliner 1996:102). The average of the six specimens is 90 mm (range: 79-101 mm), significantly smaller than the maximum for the smaller *S. princeps*. Third, two right (lower) valves are present, but rarely does one see a right valve of *S. calcifer* because they are solidly attached to the rocky substrate and can be removed only with great difficulty and then in pieces. Right valves of *S. princeps*, which are not as tightly cemented to the substrate, are much more likely to have been collected.

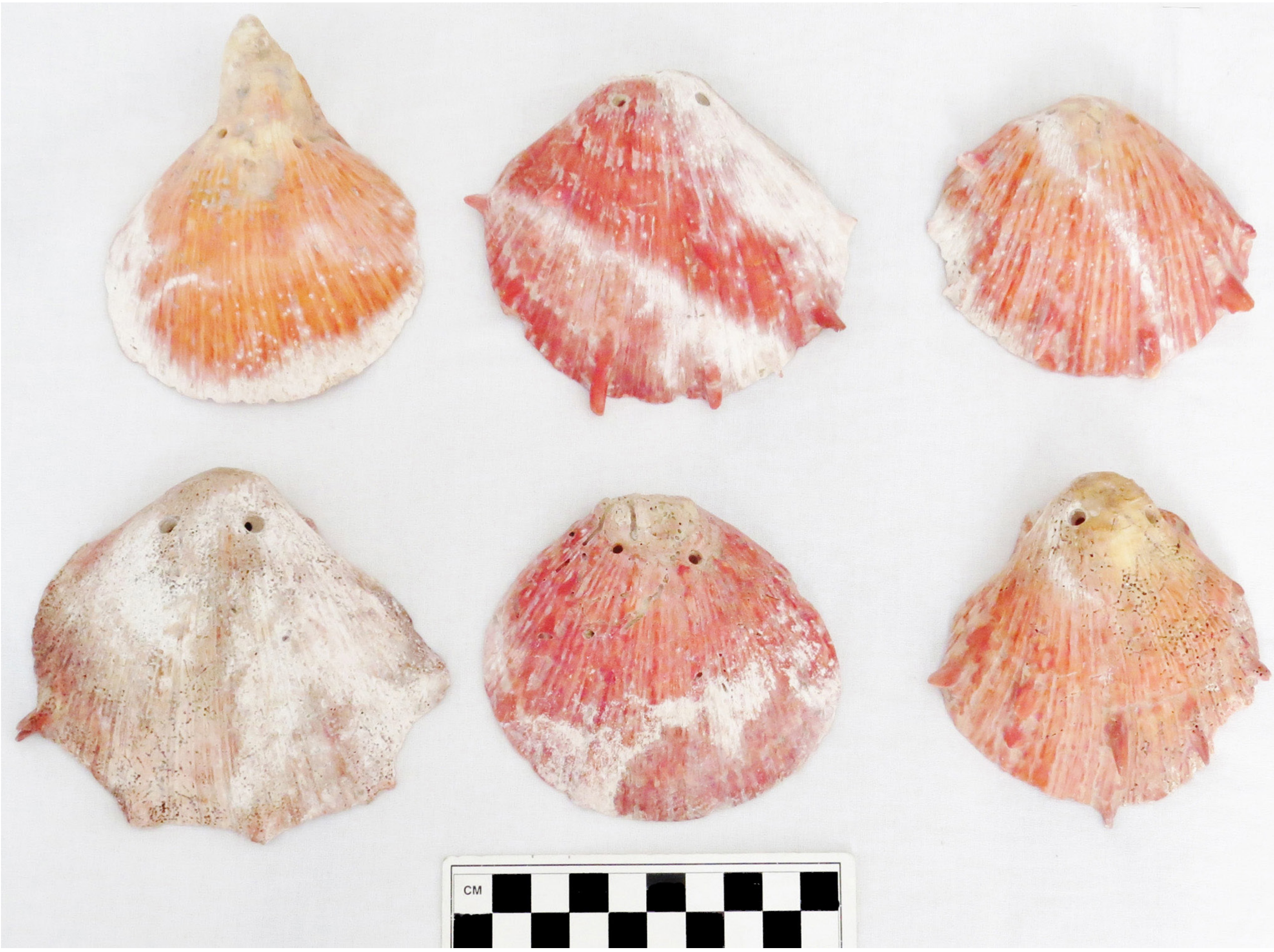

Figure 17. Whole-shell Spondylus pendants (photo by Benjamin Carter).

Fourth, the two right shells do not have apparent attachment areas. *S. princeps* tends to have small areas, but *S. calcifer* has large connection areas that tend to distort the right valve. Lastly, the spines that remain are long and pointed, like *S. princeps*; *S. calcifer* tends to have blunt and spatulate spines. The whole-shell pendants are, therefore, likely fashioned from *S. princeps*. Large adult valves may have been in high demand and large artifacts of entire worked Spondylus may have been highly valued.

The valves are perforated and ground. All six shells have two biconical holes on the dorsal portion of the valve near the umbo. The holes are an average of 20 mm apart and have an average exterior diameter of 4.64 mm (2.71-5.82 mm range). The more dramatic modification is the grinding of the exterior of the shell. On five of the shells, grinding can be recognized on nearly all exterior surfaces; only on the degraded SWS 4 (Figure 17, lower left) is grinding difficult to identify. Near the ventral margin, nearly all striations run perpendicular to the margin, largely because they appear to follow natural rows of spines that extend from the umbo to the margin. Artisans ground off the majority of the spines, but also ground out the grooves between the rows of spines leaving them deeper and smoother, accentuating the spines. On four shells, one or more spines remain, but the majority have been ground off. The spines that remain have been ground on nearly all sides and frequently, by grinding the dorsal portion of the spine, a groove was made at its base. The grooves between removed rows of spines and at the base of remaining spines make it clear that a thin (< 5 mm) abrasive (e.g., sandstone) saw was used. All of this abrasive work resulted in a shell that is smoother and shinier than the raw shell, magnifying luster and coloration. Some spines remain, however, retaining the quintessential and identifiable characteristics of the shellfish. Similar artifacts have been recovered at shell workshops and elsewhere (e.g., Cordy-Collins and Giannoni 1999:141; Shimada and Samillán Torres 2008; Topic 1989). The extensive modification of the shell to stress the few retained spines, the gloss, and the color of the shell suggest that these aspects were potent signifiers of identity.

HISTORICAL AND CULTURAL CONTEXTS

The Chimú-Inka elite of Samanco wore ornaments in death that layered and intermingled multiple signifiers producing a dynamic and potentially ambiguous identity. A number of conclusions may be tentatively drawn in this regard based on the collected data. We say "tentatively" for two reasons. First, the tomb was looted and it is likely that, although an array of artifacts made from a variety of materials was present, other objects, such as those of gold or silver, the object of the looting, were removed. We can never know what these may have been. Second, comparison with other samples is tentative because records of ornaments from other sites are rather minimal. Here, we address the possible composition of the compound artifacts based on use-wear as well as associated artifacts. We also demonstrate that the composition of these artifacts suggests clear continuity of long-term patterns of consumption largely restricted to the coast. Because the Inka had conquered the coast in the Late Horizon, this tomb clearly implies the imposition of limited control by the highland Inka and likely the deployment of perforated ornaments to stress both local and coastal identities, as well as attempts by these elite to signal Inka identity to those in power, even if it was done ambiguously.

Although disturbed, the distribution of the perforated ornaments suggests that they decorated the bodies of the four principal individuals. While many decorative options are possible, the most common along the coast is wearing the artifacts as bracelets, simple necklaces, and pectorals which are large complex necklaces composed of multiple strings of perforated artifacts that drape in concentric rows over the chest. Necklaces, pectorals, and bracelets were common among the Moche (e.g., Alva and Donnan 1993; Donnan and McClelland 1997; Ruiz 2008; *see also* Carter 2008), Sicán (Shimada 1995; Shimada et al. 2000, 2004), Chimú (Rowe 1984), and post-conquest coastal people (Donnan and Silton 2010). Based on the artifacts, we suggest that large compound necklaces were the central component of the dress of these elite. This includes a minimum of two separate necklaces, one necklace containing at least three strands, and one containing the six whole Spondylus shells. It is likely that the differently sized, shaped, and colored pendants formed separate necklaces as well. There were certainly more.

Spondylus chaquiras were the quintessential coastal perforated ornament. Frequently, especially among the Moche, chaquiras made up a sizable portion of pectorals that covered much of the chest in a single layer of beads. They were made from white, red, orange, and purple shell beads, many of which were derived from Spondylus. The red, pink, purple, white, and dark chaquiras from Samanco indicate that compound artifacts of Spondylus (and possibly other shellfish) remained important. Spondylus chaquiras were employed only to a limited degree by highland groups during late prehistory (Carter 2011). Major finds of Spondylus chaquiras in the highlands of Peru are limited to Marcahuamachuco (Topic 1989, 1991; Topic and Topic 2000) which produced ca. 3,000 chaquiras (but, for the highlands of Ecuador, *see* Doyon 1988, 2002). Among other highland groups, chaquiras were relatively uncommon and are almost completely absent in excavated and published Inka contexts (Carter 2011). Indeed, although societies on the coast of Ecuador were the primary producers of Spondylus chaquiras from ca. A.D. 200, around A.D. 1100-1200 production dwindled. After that, production persisted only at Cabeza de Vaca (Moore and Vilchez 2015) where a relatively small number of chaquiras (n = 152; compare this to the ca. 10,000 chaquiras from López Viejo; Currie 1995, 2001) were recovered among the 50 kg of Spondylus.

Although chaquira production continued, it appears to have been a minor component of the repertoire of shell artisans. Until further evidence for production is uncovered, we suggest that the chaquiras at Samanco are just as likely curated artifacts fashioned centuries before interment. This is supported by the difficulty in identifying production striations within the bead perforations as well as the frequency of parallel-sided perforations, both of which suggest extensive wear produced by abrasion against fibers such as cordage and clothing. The chaquiras may have been heirlooms passed down from the predecessors of the deceased or recovered from older tombs or graves by the Chimú-Inka of Samanco. The chaquiras, therefore, suggest not only a clear continuity in coastal ornamentation, but provide evidence for intentionally retaining (or recovering) and deploying heirloom artifacts that connect the local elite to a long line of local elites and distinguish them from the peoples of the highland and from the Inka imperium.

The prehistory of non-Spondylus chaquiras is less well known. The black stone examples appear at approximately the same time as Spondylus chaquiras, but have a more limited distribution. They are best represented in later Moche IV (5th-8th centuries) domestic contexts in the urban sector at Huacas de Moche (Bernier 1999, 2010a, 2010b). These non-elite contexts included numerous beads made from a local "steatite-like" stone which may be the black stone at Samanco. These beads were made at the site (Bernier 2010a) and may be the same material present in a Chimú-Inka burial at Santa Rosa, near Tumbes (Moore 2010:546), and in Late Horizon contexts at Chincha

(Kroeber and Strong 1965:51-52). With the exception of black beads in a pectoral purportedly recovered from the Chimú capital, Chan Chan (Rowe 1984:167), black stone beads appear to be associated with non-elite contexts. At a workshop at Huacas de Moche, extensive waste suggests to Bernier (2010a:27) that this material was local and "not of great material value." The black stone chaquiras appear to be rather rare and production was restricted to Moche IV at Huacas de Moche. Therefore, because there are nearly as many black as red beads, the 751 black stone specimens are an exciting, but difficult to interpret, find. Could they also have been curated or recovered from burials? If so, could the fact that they are heirlooms convert a relatively "cheap" material into one more valued?

Based on the average thickness of the chaquiras (1.44 mm) and the total number (3,256), these beads could have formed a single strand approximately 4.69 m long. Clearly, multiple strands were employed and would have formed necklaces and bracelets. Based on the small ceramic spacer with three perforations (Figure 7), one of the compound artifacts was composed of three strands. Evidence suggests that the beads were arranged by color and material. The few beads that remain strung together are all a single color, either black stone or white shell, suggesting that bead strands, or portions of them, were monochrome. Yet, a single white chaquira found within the spiral copper bead clearly indicates that at least some strands contained beads of a variety of materials. A number of blue sodalite beads were indented around the perforation, perhaps from being strung next to chaquiras that abraded the sodalite beads through small movements over a long period of time. It is, therefore, likely that the chaquiras comprised adornments that included beads of different materials similar to the compound ornaments recovered from Sicán (Lambeyeque) (Shimada 1995; Shimada et al. 2000) and Sipán (Alva and Donnan 1993) sites. We suggest that compound necklaces and bracelets would have been designed to create figures (as was done at Sipán). These artifacts should be seen, not as strands of beads, but as beadwork – as colors used to construct images much like textiles or tilework (e.g., Cordy-Collins and Giannoni 1999; Rowe 1984). On this note, it is interesting to ponder what iconography may have been deployed via the chaquiras pectorals. Were these imperial, local, or ambiguous images? Geometric? Iconographical?

Plaque pendants have a long history in coastal and highland Peru (e.g., Cordy-Collins and Giannoni 1999:135-137). These artifacts are present at many Moche sites, including a workshop for Spondylus plaques at Pampa Grande (ca. A.D. 550-650/700) (Haas 1985; Shimada 1994:213-216). The Chimú also fashioned them. Schaedel (1966) recorded evidence of large-scale production of these artifacts, along with inlay, from Spondylus at Huaca el Dragón in the Moche Valley. Plaques continued to be made after the Inka conquest. At the Late Horizon site of Cabeza de Vaca, plaques were the important product fashioned at the Taller Conchales (Moore and Vilchez 2015). Similarly, the shell artisan interred at Late Horizon La Viña (Shimada and Samillán Torres 2008) also made plaques. They appear in the highlands at Marcahuamachuco and at Huari and some Inka sites as well (e.g., Llullailaco; Reinhard and Ceruti 2010:83). Plaque pendants indicate that the Samanco interments are part of the contemporary cultural tradition of making Spondylus plaques that spanned social segments and geographical regions. If chaquiras demonstrate a deep connection with "antique" or "heritage" ornaments that are no longer produced and must be obtained from the ancestors, Spondylus plaques reveal a connection to active, but deep, traditions of production. The plaques from Samanco would have yielded a single strand approximately 2.4 m in length (7.859 mm average width x 314 pendants). Since there are clear size differences between smaller orange/purple/iridescent pendants and larger white pendants with traces of red/orange/purple, there were at least two different strands and likely more. Plaques may have been used in necklaces, but decoration for textiles is also an important possibility, the mother-of-pearl artifacts in particular (Mester 1989).

Whole Spondylus shells have been frequently noted, but relatively few have been described to the degree that they can be compared to the whole-shell pendants from Samanco. The few well-documented examples come from a wide variety of sites in the highlands and along the coast (Cordy-Collins and Giannoni 1999:141; Iriarte 1978; McEwan 2005:30-32, 47-48; Menzel 1977; Topic 1989). These types of artifacts are, however, present in many of the small museums along the Peruvian coast and, therefore, were likely more popular than a survey of the published literature suggests. It is quite likely, based upon available imagery (Cordy-Collins and Giannoni 1999:141), that whole-shell pendants formed a single necklace. The six whole-shell pendants from Samanco would have formed a large necklace that rested on the other necklaces and blocked their imagery. This should not necessarily be seen as negative since layers of necklaces would have been both impressive in their complexity and created a virtual palimpsest of identities upon the chests of the wearers.

Of the larger beads, those fashioned from sodalite and quartz/amethyst are particularly distinctive, but also poorly documented. Neither of these materials has been adequately studied (Burger 2013:331; Petersen 2010:11). Cylindrical sodalite beads are found in the highlands and along the coast. Indeed, the earliest worked gold is arranged into a necklace with cylindrical "possibly sodalite" beads (ca.

2000 B.C.) (Aldenderfer et al. 2008:5004). Sodalite, which may be a catch-all category for bright (or not so bright) blue stone that should more accurately be labeled chrysocolla, azurite, etc., is well represented through prehistory in the highlands (e.g., Bandy 2004; Cantarutti 2013) and along the coast. It is especially numerous in the Huaca Loro tombs of the Batán Grande area (Shimada 1995; Shimada et al. 2000). The Huaca Loro tombs also contain quartz beads, but this material, perhaps because it is so ubiquitous, has not been well studied and quartz beads appear to be relatively rare (Bernier 2010b:94). The proximity of an important source of quartz at Mina Adan (Petersen 2010:3, 11) and the difficulty in working this material, suggests that it was an important component of local identity.

The remaining beads of wide-ranging materials (copper, seeds, turquoise, etc.) also connect the wearer with local and imperial identities. Turquoise and copper were widely used on the coast and in the highlands, and it may be that particular types of beads are associated with certain identities. This requires further investigation. Ishpingo beads, however, are restricted to late prehistoric coastal identities; i.e., Chimú and Chimú-Inka (Eeckhout 2006; Montoya Vera 1996, 1998, 1999).

CONCLUSION

The Chimú-Inka tomb at Samanco highlights the nested, and potentially ambiguous, manner in which perforated ornaments were deployed in the dynamic crafting of identity in Andean South America. Nearly all of the materials and forms of perforated ornaments used by the principal individuals (or, perhaps, by the mourners) can be considered part of a coastal identity. Yet, numerous forms were also employed by highlands peoples. The deployment of coastal materials and artifacts (e.g., ishpingo seeds, black stone chaquiras, and Spondylus chaquiras) – and even some that were highly localized (e.g., quartz and amethyst) – would have vividly and clearly documented elite identity to those around them. These perforated ornaments would have screamed "We are like you!" to the people in local settlements, while at the same time the quantity and variety of artifacts demonstrated the privileges, rights, responsibilities, and power of the elite. To coastal elites beyond local settlements, these artifacts demonstrated their shared identity as the privileged few with collective rights to local power and intergroup competition and negotiation. More broadly employed artifact types (e.g., Spondylus plaques and possibly whole-shell pendants) allowed elites to demonstrate shared identity with both distant highland peoples and locals. The ambiguity of these artifacts permitted elites to speak with different visual "voices" to diverse audiences, creating connections to peoples with alternative world views and, therefore, conceptualizations of the same perforated ornaments. The wide range of materials allowed the wearer to literally layer his or her identity. Unfortunately, many aspects of bead use cannot be identified at this tomb. Which materials and forms were in the outermost, highly visible layer? Which messages or nested identities were stressed? Could these be rearranged based upon the audience?

There is little doubt that perforated ornaments were a highly significant component of identity production and projection on the late prehistoric coast of Peru. Unfortunately, this study is hampered by the relative lack of a comparative sample. Although general types can be productively compared, this study would have been greatly enhanced by more detailed documentation (e.g., measurements, color, and material) of perforated ornaments from regional sites. We, therefore, offer methodological details in order to advance the study of perforated ornaments, as well as identity production and negotiation in the Andes and beyond.

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ENDNOTE

1. It has been suggested that purple beads are made from *Spondylus calcifer* because this species tends to be purple more frequently than *S. princeps*. Nevertheless,

because *S. princeps* can contain purple, it is difficult to determine in a small sample, such as chaquira, from which species the bead originated.

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FROM THE PAST: INDIANS OF U.S. SPURN ALL BEADS EXCEPT ITALY'S

Unattributed newspaper article, probably New York City (a shorter version appeared in The Review*, Dayton, Ohio, Nov. 15, 1934). It presents both fact and some fiction, like the Czechs not being able to "horn in" and the Italian beads being made near Milan.*

New York – For generations Italy has been supplying the American Indian with all the beads employed in the decoration of his apparel and his horse gear, to the exclusion of the products of any other nation. The red folk will buy nothing that isn't up to their own standard of quality, and, thus far, no people save the Italians have been able to meet this demand.

Just how American manufacturers have managed to neglect this field of production is yet to be explained, but the fact remains that they don't count at all in the competition for the Indians' trade, and, in point of fact, Czechoslovakia is the only other country which has attempted, without success, however, to "horn in."

Right in New York is the center of this bead importation for the whole aboriginal population of America, and from the wholesale district here consignments of these tiny decorative globules are dispatched almost daily to trading posts all over the West and to a considerable extent to the remaining Amerind communities of the East, such as the New York State Indians, the Seminoles of Florida and the little groups in Maine.

According to tribal taste the size and colorations of the beads vary, but whether the eventual output of the Indians' industry is moccasins, war bonnets, war shirts, knife and tomahawk sheaths, belts, leggings, rifle slings or papoose carriers, the beads themselves are Italian, made for the most part in the neighborhood of Milan and shipped to New York via Venice.

Dan Frost, sole proprietor of S.A. Frost's Son, in Howard Street, explains that the buying of the Indians' supplies of beads requires a complete knowledge of the taste of the various tribes. "Alaskan Indians, for example," he said, "buy the smallest beads manufactured. Eastward from that territory slightly larger beads are preferred. None of them, however, are large, for the delicacy of the designs most generally requires the use of quite tiny beads. But every Indian tribe has some variation of taste, either as to size or color, in the beads they acquire for their industry. They are disposed to use the more delicate and exquisite for the things they make for themselves as compared with the things they make for sale, but they maintain a pretty even standard in the matter of demand at that."

Forty Shades Are Used – Difference in the size of the beads is not the only test of Indian taste, according to Mr. Frost. Some of the tribesmen want clear glass, whereas the larger demand is for those of the opaque type.

The color range is wide, about forty different shades of glass beads being sold here with all the rainbow colors and many variant tints based upon the seven shades of the spectrum. The largest demand for beads centers upon the opaque white variety,

"Of course," Mr. Frost resumed, "the latter-day Indian makes no beads of his own. He uses porcupine quills, dyed and sewn in intricate designs, for some of the decorations on his apparel, or other gear, and there are horn and bone and feather embellishments to his ceremonial dress. But it is a remarkable, and to me unexplained, fact that the Indian in distant centuries possessed beads and used them. Whence they came I do not know. There were bead designs on the costumes of the Peruvian Incas and the Aztecs. In the burial mounds beside the Mississippi they have dug up remains of buried heroes, laid to rest long before De Soto ever saw the river, that wore on their last journey garments embellished with beads similar to those sold today."

Foreign Imitations – "Lately there has been some foreign effort to imitate for the American market the products of Indian workmanship. The artful Chinese have tried their hand at the beadwork, and the imitations of the Navajo loom products, rugs and blankets, have been numerous. The Chinese imitations of the beadwork, like the Oriental efforts to duplicate cheaply the delicate French and Irish and Italian laces, have been crude and not durable. One doesn't have to be an expert to detect the counterfeit, but too few buyers really care. The imitations of the Navajo blankets are even worse. What the American Indian deserves from the central government is protection in his arts and his industries."

Mr. Frost was at some pains to explain that it was not tariff protection that the Indian needed, but protection equally against the American manufacturer who copies his designs, his colorations and his fabrics and foists it on the unsuspecting purchaser as genuine. He thinks a law could be honestly and fairly drafted to accomplish just this.

BOOK REVIEWS

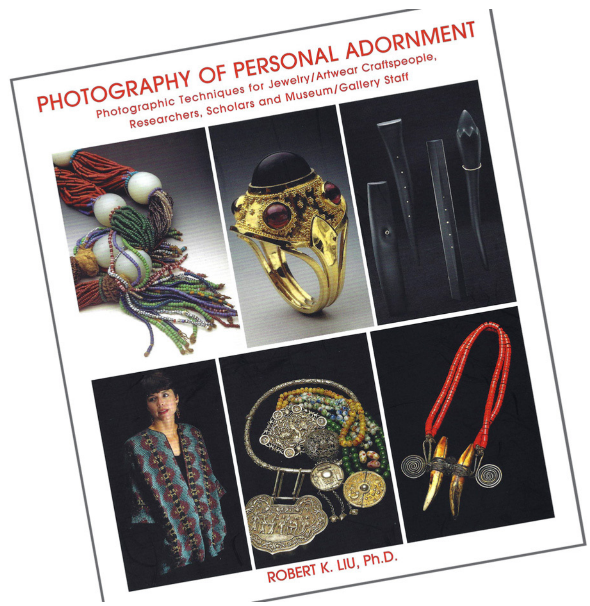
Photography of Personal Adornment.

Robert K. Liu. Ornament, P.O. Box 2349, San Marcos, CA 92079. 2014. 160 pp., 520 color and B&W figs., glossary, index. ISBN: 978-0-692-32387-8. $38.95 (paperback).

Just about everyone in the bead world is familiar with the luscious pages of *Ornament* magazine which are made so by the gorgeous photographs of sumptuous objects of bodily ornamentation. Created in a photographic style both highly recognizable and influential, *Ornament*'s pages are very desirable places for artists' work to appear, in large part due to that beautiful photography. Reading *Photography of Personal Adornment* is like spending an afternoon surrounded by a pile of *Ornament*s from the last twenty years, engendering a feeling like visiting with an old and much-loved friend, but also making it harder to see the images anew for their being so familiar.

As the originator of *Ornament*'s photographic style, Robert K. Liu, a self-taught photographer, brings to the magazine's pages a discerning and particular eye, one utterly devoted to showcasing beauty. In this book, Liu promises to show the reader how to compose works for photography, how to use particular lighting, backgrounds, and props, how to "see" what works and what doesn't, what to consider when shooting magazine and book covers and advertisements, and things to remember while shooting in non-studio settings.

Liu's Preface and Acknowledgements clarify his background and photographic education and set up the *Ornament* back story. The Introduction covers the general history of the use of first film, then digital cameras to document fine craft work, and discusses some shortcomings of the changes in how photographic images are captured, yet acknowledging the benefit of software to enhance what could only previously be done laboriously in the darkroom. A survey of photographic and studio equipment follows which, while thorough, is not meant to be an exhaustive study of what is needed or how it is used. Following the excellent base he establishes here, further reading into the use of digital cameras and the purchase, production, and use of studio equipment is advised. Liu's suggestions for narrowing the many choices faced by the novice photographer are especially helpful. He illustrates his many points with good, if small and sometimes cramped, photographs of picture setups and photo studios.



Of especial use are images of the same object(s) shown with different backgrounds or lighting, to illustrate the differences that occur when one varies shooting methods. It encourages the novice photographer to test a number of different backgrounds, systems of lighting, and camera angles to see what best shows off an individual piece. With the immediate feedback of digital photographic systems, this is now easy to do. Sometimes the differences are quite dramatic.

With many of the shots, Liu discusses in great detail how the shot was set up, and describes the use of handmade devices to hold objects at particular angles or "levitate" them in the air so that they float freely. He points out the use of any number of props and systems for grouping objects, and introduced me to the idea of using a bit of beeswax to "stick" an object where it is wanted, without harming either the object or the background.

Ornament's photographs are so dramatic in large part due to two particular elements: simple, clean backgrounds (light-absorbing black Tuf-Flock, soft white backlit translucent Plexiglas, and light-to-dark shaded Varitone sheets) and lighting (softboxes, backlighting, reflected light). Liu provides significant information about both. Moving on in the book, he discusses the process for determining the best layouts of the pieces being photographed, compares ways to vary the layout, discusses imitation materials, describes how to create photographs of craft processes and what it's like in photographic and artists' studios, explains how to work with models, how to shoot beads, beadwork (though far less of the latter), and clothing, and delineates the process of setting up shots for magazine covers and advertisements.

Moving out of the studio, Liu writes about dealing with museums and the special problems of shooting therein. *Photography of Personal Adornment* ends with the photographing of events, including fashion runways and exhibition openings, and a glossary of photographic terms, references/bibliography, and an index.

Liu says "If you are lucky enough to get great material to photograph, it is almost a crime not to be playful." I think this is an important consideration to remember and it is well illustrated throughout his book. He also emphasizes the importance of shooting details as well as full shots for the additional detail provided in a closeup (i.e., the Asyut dress, p. 146; Kathleen Dustin's *Village Women* beads, p. 45). Throughout the book, he discusses the various craft techniques used by the artists, thus giving any reader who loves crafts a greater understanding of just how many of the pieces pictured were made, and emphasizes the need to understand what you're shooting so that you can shoot it properly.

It was sadly sweet to see the photograph of Gabrielle Liese in her younger days, reminding us that *Ornament* has been recording the history of the bead movement as well as the modern art jewelry/clothing movements, showing in the pages of both *Photography of Personal Adornment* and *Ornament* the work of many artists, scholars, and gallerists, recording important museum exhibitions, and noting the existence of the bead museums and bead groups now passed into history. This is an extremely important legacy to leave behind.

There are a few things I find uncomfortable about the book. It is in a smaller format than needed, squeezing much text and many pictures into a page size that did none of them much good, with the text tightly kerned to maximize the amount of verbiage included. Some pictures were difficult to discern (i.e., some shots of studios) for having too much visual information crammed into them, and there were a surprising number of typos, a bane to someone like me whose eye cannot help but zero in on them. Sometimes the same term was rendered inconsistently (talhakimt vs. talhâkimt, for instance) or was used improperly (pre-columbian vs. pre-Columbian). Because the book draws exclusively from material shot for *Ornament*, the style is so strong and consistent that not only are many people already using it, thanks to the magazine's influence, but with the advent of *Photography of Personal Adornment*, many more will as well, thus potentially watering down the long-term impact of the style. It may have been beneficial to contrast the *Ornament* style with that of other photographers so as to offer further choices of how to approach the photography of such objects.

Overall, however, *Photography of Personal Adornment* succeeds because it takes a popular magazine recognized by most jewelry and clothing artisans, who likely have it on their shelves, and parses the process used in creating the photographs within, instantly giving the reader immediate tools for making their own wonderful photographs. Liu points out what succeeds with juries and customers, and gives people good and bad examples from which to learn. He discusses materials and processes that make good pictures much easier to take and answers the question many undoubtedly have had: "How did Robert take that picture?" He makes strong, beautiful photographs easily doable by anyone with a modicum of camera skills with a teaching skill that conveys important and complex information relatively clearly. I wished I'd had this book when I was shooting images for publications and postcards in the 1990s. Finally, unlike so many people who live "only in the now," Liu recognizes and points out that photographing all this material helps "preserve it for the future," even those photographs not intended for publication. This book is well worth adding to the library of anyone seeking to document their own and others' work.

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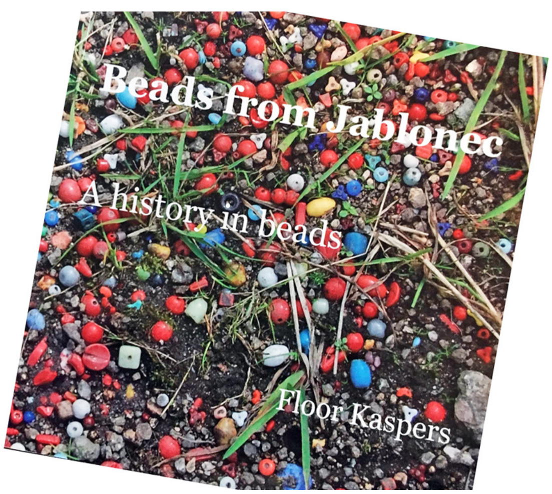
Beads from Jablonec: A History in Beads.

Floor Kaspers. Marblings Publishing, Amsterdam. 2014. 115 pp., 133 color figs. ISBN: 9789-49131-1024. $27.00 US (paper cover), $37.00 US (hard cover). Also available as a free PDF download.

Floor Kaspers has already produced two small books (17 cm square) on beads. One takes the reader on a visit to the famous annual bead show at Tucson, Arizona; the other on a visit to Briare in north-central France. On the bead trail, we now get a visit to Jablonec nad Nisou, the Czech beadmaking city formerly known by the German name Gablonz.

The first part of the book covers the early glassmaking period, 1550-1750. The next period of glassmaking (1750-1918) includes discussions of molded beads along with the equipment used, faceted beads including "Russian" beads, followed by an architectural digression on the town of Jablonec and the glassmakers, especially the Riedel family. Also discussed are special beads such as those of uranium glass, special shapes for overseas markets, "Hubbell beads," and Swarovski glass. During the 1918-1945 period , Jablonec craftspeople made a wide variety of beads and other jewelry, some of it influenced by Oriental and Egyptian styles.



The war years saw Jablonec under German occupation which involved Sudeten Germans taking over beadmaking from the pre-1938 Czech population. After the war, the Czech majority expelled most of the Germans in a reaction against the Nazi occupation. This meant that many beadmakers left the area and bead and bijouterie production diminished sharply. The post-war period is hard to disentangle, as accounts are colored by political bias. Five industries evolved into a new grouping under the name of Jablonec Bijoutery. This evolved into the state company Jablonex, later taken over by Preciosa. Beads and jewelry continued in production with cheap labor provided by prison inmates. After the Communists lost power in Czechoslovakia in 1989, production continued through private enterprise, but lost ground to India and China. Kaspers' historical narrative derives from a number of sources which are meticulously noted in the Notes and Bibliography at the end of the book.

Bead illustrations form a major part of the pictorial copy which range from sample cards though equipment for bead manufacture and work places, to examples of different sorts of beads, and even dumps where discarded beads lie in colorful spread. As with Kaspers' other books, there is a variety of local scenery as well as a goodly number of purely bead images, including a glassblower on page 12 and another on page 103, as well as numerous shots of factories and miscellaneous architectural features that provide a sense of visiting the town as a whole, rather than focusing solely on beads and bead production. The illustrations range from full-page to smaller ones at four to a page. Many have a caption or other ways of identifying the subject. When a caption is absent, it can be sorely missed.

The Contents page comprehensively lists the subjects covered under five subdivided headings, making it easy to find the way about. It would, however, have been an improvement if page numbers had been added to the subject headings. This lack may have arisen from the way the Blurb self-publishing platform seems to process the copy that it works from, which appears to be a direct printout, with no scope for editing the copy or the pagination. This means, for example, that on page 110, the entry for "Francis, Peter" has got the entry for "Hannich, Wilhelm" stuck on seamlessly, and the entry for "Kaspers, Floor" is split up, ending two pages later. There are several typos which might have been avoided if the production method had allowed for an extra proofreading. The four-page bibliography includes Waltraud Neuwirth's bilingual book on *Beads from Gablonz* (1994); it would have been useful to include the version published in *Beads* 23 (2011). The bibliography shows that there is already plenty of published material concerning Jablonec; this little book is a delightful addition to the whole.

The book is available in both a hard- and soft-cover version, as well as a free PDF download: https://beadmuseum.files.wordpress.com/2014/10/beadsfromjablonec.pdf.

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Heidi Munan and Anita MacGillivray (eds.). Crafthub, No. 96 Main Bazaar, First Floor, 93000 Kuching, Sarawak, Malaysia. 2015. i-vi + 238 pp., 23 color and B&W figures. $65.00 plus postage (paper cover). To order, contact crafthub@gmail.com.

This journal publishes the nine papers presented at the 4th Borneo International Beads Conference held in Kuching, Sarawak, Malaysia, 9-11 October 2015. The articles reflect the conference's theme of "Stringing the Past and Present." They range across continents and time periods, but the connection between the past and present is made.

"American Indian Beads and Beadwork," by Jamey D. Allen, discusses the beading traditions of the indigenous peoples of North and South America, but mainly focuses on those of the United States. It discusses these traditions according to whether they occurred before or after European contact, as well as the incorporation of introduced European beads into Native constructs. Allen indicates that beadwork was likely introduced by early European traders.

"The Archeological Beads of Palawan," by Jun G. Cayron, takes the reader on a journey to important archeological sites on Palawan Island, the Philippines: Ille Cave in Dewil Valley, El Nido in the Tabon Cave Complex, and the Pandanan shipwreck. These sites contained glass beads imported from Arikamedu in India, Chinese beads, jade from Taiwan, and gold beads. The trade routes that probably transported these beads are discussed. Shell beads were the most common and there are indications that they were manufactured on Palawan Island. The Pandanan shipwreck, which has been dated to the mid-15th century, contained various artifacts including Vietnamese earthenware ceramics and beads in Vietnamese stoneware jars.

"Immersion in Modern Medias – The Allure and Attraction of Polymer Clay," by Lara Le Reveur, discusses this medium and how she uses it. She also provides detailed information on the steps in using this versatile type of clay.

"The Art of Bead Stringing – Artist to Entrepreneur," by artist and entrepreneur Elaine Robnett Moore, provides practical and creative advice that includes the factors affecting the overall beauty and visual appeal of bead artwork along with practical ways of getting the pieces into the marketplace.

"Threading for Survival: An Insight into Contemporary Rungus Bead Culture in Kampung Tinangol, Kudat in Sabah," by Reita Rahim and Malina Soning, shows the evolving traditions of the Rungus people of Sabah, Malaysia. The writers, who are from Gerai OA, a non-profit group that works with indigenous women's groups to increase economic security, discuss the external influences, the economic necessity, and a famine that forced the community to enter into beading, as well as current issues that the artists face.

"Tamilakkam: A Multi-cultural Centre for Bead Trade," by Ashvin Rajagopalan and Darshini Sundar, outlines a study that aims to understand the bead trade in Tamil Nadu, India, from 400 BCE to the present day. The writers correlate the beads found in the region to the history of India, Roman influences, trade, and beadmaking techniques. They note that the beads produced at Arikamedu, mother of Indo-Pacific glass beads, are found in Europe and Southeast Asia. In fact, Cayron commented in his paper that beads produced here were found at the Palawan Island archeological sites.

"Turkish Tradition in Contemporary Malaysian Garments," by Dr. Khatijah Sanusi, begins with a description of the evolution of Turkish garments. She then shows the connection to contemporary Malaysian *Baju Kurung*, which is a long, knee-length caftan worn over a long pleated skirt. The Turkish people, who originated in eastern Central Asia and Russian Siberia and migrated towards Eastern Europe in many waves, wore loose-fitting clothing embellished with decorations that could include bead embroidery. Dr. Khatijah draws parallels to this style of clothing, and then discusses the work of two bead artists who also embellish traditional garments with beads. Wan Norzita Othman adorns the traditional *Baju Kurang* while Azmatul Hazrin creates striking beaded bib chokers.

"The Lukut Sekala Bead of Borneo," by Wendy Terang, focuses on a single valuable bead, the *Lukut Sekala*, which has cultural, ritual, and economic significance for the Kayan and Kenyah, two of the many indigenous groups of Sarawak, Malaysia.

"Unravelling the History of Glass Beads in Arnhem Land, Australia," by Daryl Wesley and Mirani Litster, charts the early history of the indigenous people of Arnhem Land in the Northern Territory, Australia, which includes interaction with fishermen from Makassar and Sulawesi, as well as Europeans and other foreigners. Archeological sites in the region that yielded beads date to 1668-1780 and 1810-1921. Possible ways that the people of the area obtained (earned, traded, or were given) beads is discussed.

The articles in the journal are diverse and sweeping in their scope. This variety of topics and interests is the publication's strength as it reaches out to multiple bead groups including artists, historians, archaeologists, and bead lovers in general.

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