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Cover Page Footnote

The author would like to thank Elizabeth Harris, Adam Jones, Karlis Karklins, David Killick and Merrick Posnansky for providing comments on different aspects of this research.

BEADS AS CHRONOLOGICAL INDICATORS IN WEST AFRICAN ARCHAEOLOGY: A REEXAMINATION

Christopher R. DeCorse

Drawing primarily on data obtained from recent excavations at Elmina, Ghana, this report examines the potential use of beads as temporal markers in West African archaeology. It is argued that although beads from West-African contexts are difficult to date, they provide more information than has previously been suggested. The Elmina beads are of particular interest as they can be closely dated by associated European trade materials. Preliminary results from the analysis of the 30,000 European and locally-made glass beads are discussed and findings from other West-African sites are evaluated.

INTRODUCTION

In 1972, Lamb and York wrote an article entitled "A Note on Trade-Beads as Type-Fossils in Ghanaian Archaeology." (Lamb and York used the term "type-fossil" to suggest the possible use of beads as temporal markers. In a strict palaeontological sense, "type fossil" refers to a taxonomic exemplar and connotes no chronological sensitivity.) Although the focus was on Ghanaian beads, their comments had implications for the entire West African region. The authors had a bleak opinion concluding that "the usefulness of glass beads as type-fossils in archaeological contexts is minimal" (Lamb and York 1972: 109). In light of almost two decades of research, a review of Lamb and York's conclusions is appropriate. While the dating of West African beads does pose special problems, research outside of Africa and recent excavations at Elmina, Ghana, suggest they perhaps hold more promise than was previously thought.

DATING WEST AFRICAN BEADS

The major problems faced by researchers in West Africa are the potentially great ages and the extended

life spans of the beads that they recover in archaeological and ethnographical contexts. Even in North America, where a great deal more research has been undertaken, the dating of European beads of the past 500 years is problematic. However, the importance of beads was well established in West Africa long before the arrival of the Europeans on the coast at the end of the 15th century A.D. Bone, ostrich-shell and metal beads have been recovered from many Late Stone Age and Iron Age contexts, and there appears to have been a trade in stone beads in the western Sudan by the first millennium A.D. (e.g., Connah 1981: 194-195; McIntosh and McIntosh 1980: 162; 1986: 430).

Glass beads found their way to West Africa prior to the 15th century via the trans-Saharan trade with North Africa (Fig. 1) and some indication of their importance in West Africa can be found in the writings of Arab travelers of the 12th to 14th centuries (Levtzion and Hopkins 1981: 128, 130, 169, 179, 287). The trans-Saharan trade was well developed by medieval times but most likely existed much earlier, if only on a limited basis. Depictions of chariots in Saharan rock art and occasional documentary references suggest that some contact probably occurred during the 1st millennium B.C. (e.g., Garrard 1982: 444-446). It is likely that the advent of the camel in the 1st or 2nd century A.D. greatly facilitated trans-Saharan transport and the origins of a regular trade may be traced to this period. Because of these early contacts, the mere presence of glass beads does not provide an immediate temporal marker for the age of European expansion.

While beads and other trade items undoubtedly reached West Africa in significant quantities before the arrival of the Europeans, positive identification and dating of these materials is often difficult within

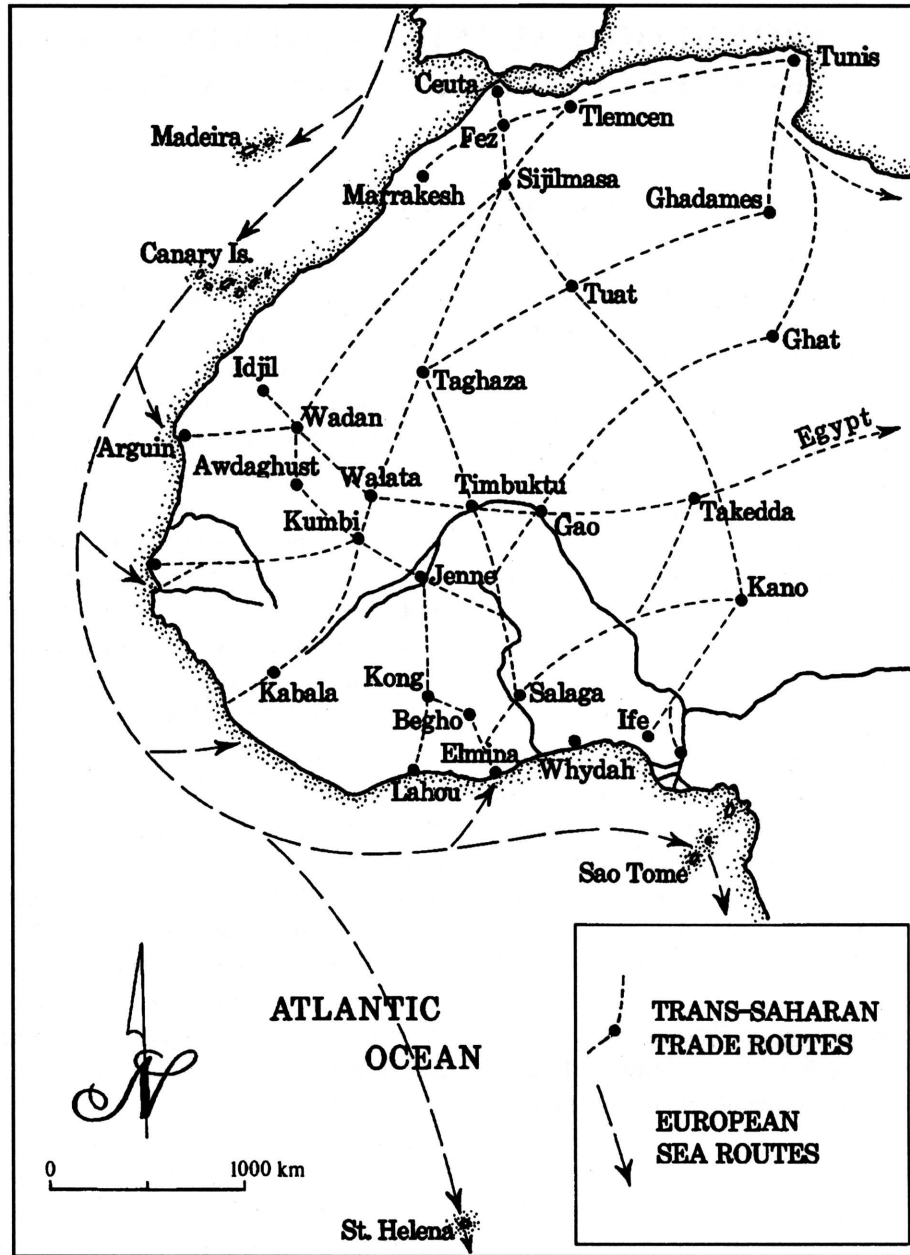


Figure 1. Map of West Africa (see MacIntosh and McIntosh 1980: 70; Garrard 1980: 33) (drawing by D. Kappler).

an archaeological context. The site of Igbo-Ukwu, Nigeria, excavated by Thurstan Shaw between 1959 and 1964, illustrates the difficulties. Actually three discrete areas designated Igbo-Richard, Igbo-Isaiah and Igbo-Jonah, the site yielded a spectacular assemblage of bronze, copper and iron objects, and over 150,000 glass beads. Chronology was principally provided by five radiocarbon dates (Shaw 1970: 259-262; 1975). Four of these dates cluster in the 9th and 10th centuries A.D., while the fifth was 505 ± 70 B.P., which provides a calibrated date in the 14th or 15th century A.D. The early determinations were questioned as being too old, and Lawal (1973) contended that the presence of *manillas* and the large number of glass beads argued for a much later, post-European-contact date (Posnansky 1973: 310; cf. Shaw 1975). However, more evidence for long distance trade in the Sahel during the first millennium A.D. and three new dates from Igbo-Ukwu tend to support Shaw's original ca. 9th-century assessment (McIntosh and McIntosh 1986: 433-434; Posnansky 1980).

It is frustrating that the beads were not helpful in resolving the controversy. Most are simple monochromes, and others bear at least a superficial similarity to European imports that could have reached West Africa by the end of the 15th century (i.e., Shaw's types W and X). The bead distributions varied between the three areas, possibly supporting the suggestion that they are not contemporaneous. Chemical analysis of the beads was of some help in identifying their origin. Shaw (1970: 259) initially suggested that they were largely of Indian or possibly Venetian manufacture. However, neutron activation and x-ray fluorescence analysis indicated that a Near-Eastern or Islamic origin was more likely if the beads were ca. 9th century in age, while Near-Eastern or European origins were equally likely if they dated to the 15th century (Davison 1972: 311). On the basis of their similarity to beads from Ingombe Ilede, Zambia, Shaw (1970: 259) used the beads to support the 9th-century date. However, the Ingombe Ilede beads, initially believed to date to the 9th century, are now known to date to the 14th or 15th century (Phillipson and Fagan 1969). It is notable that the collection is *not* comparable to assemblages from 16th- and 17th-century Spanish trade sites in the New World (cf. Deagan 1987: 116; Fairbanks 1968; Liu and Harris 1982; Mitchem and Leader 1988; Smith 1983; Smith and Good

1982; Wray 1983). Early New-World trade beads such as the Nueva Cadiz plain and twisted types have been noted in non-archaeological contexts in Mali (Elizabeth Harris 1989: pers. comm.).

The occasional beads recovered from other proto-historic West African sites have proven equally unhelpful as chronological indicators (e.g., Mauny 1949a; McIntosh and McIntosh 1980: 164; cf. Sutton 1982: 414). As Lamb and York (1972: 110; cf. Lamb 1969; 1971; 1978; Shaw 1961: 74-79) noted, the long ancestries of some beads make it difficult in some cases to positively separate beads of 4th-century Roman origin from those of 17th-century Dutch manufacture.

The confusion between pre- and post-European beads is complicated by the fact that the first European traders on the coast probably made a conscious effort to offer items for which there was already a demand. Their arrival did not create new trade patterns, but utilized and expanded existing networks. However, trade was increasingly redirected away from the long-established trans-Saharan trade toward the new frontier of opportunity provided by such coastal sites as Lagos, Whydah and Elmina. A greater variety and quantity of goods was offered, including an increasing number of bead types. However, as Shaw (1975: 510) pointed out in his discussion of the Igbo-Ukwu material, not enough is known about trade patterns during the relevant centuries to be certain which bead types were introduced at particular times. It is possible that at least some of the beads arriving via the trans-Saharan trade and early European trade beads were from the same sources.

There are references in European documents regarding the importance of beads in West African societies. However, these references are of little practical use in dating examples recovered archaeologically. Terms such as *madrigettes*, *paternosters*, *contoir-teeckens*, *olivetjes*, and *aheyne coffé* are difficult to equate with specific bead varieties (e.g., Bosman 1967: 120; de Marees 1987: 34, 53-56, 80; Hemmerson 1983: 109; Müller 1983: 204-206, 214; Van Dantzig 1978: 82). Adam Jones and Albert Van Dantzig have noted that the majority of European beads brought to the Guinea Coast were probably drawn beads from Murano (de Marees 1987: 53, fn. 8). Beyond the simple listing of beads as trade items or as types of adornment, the only early writer that pro-

vides helpful information seems to be de Marees, whose early 17th-century account of the Guinea Coast influenced a number of later writers (Jones 1986).

The problems faced in interpreting these early documentary records are illustrated by *akori* beads. They are variously known as *coris*, *accary*, *akori*, *aigris* and *aggrey*, and it has been hypothesized that they were glass, coral, carbuncles, stones or iron slag, but positive identification of the "original" *akori* bead remains difficult. Whatever the original meaning of the term, it probably became more generalized and gained different meanings through usage (Bovill 1968: 26-27; Davison 1970; Davison, Giaque, and Clark 1971; Fage 1962; Jeffreys 1961; Kalous 1966; 1979; Krieger 1943; Landewijk 1970; Mauny 1949b; 1958).

Documentary records also have been of limited use for determining bead sources. Many European traders obtained goods from middlemen, and without adequate documentation it is difficult to trace their ultimate origin. Significant amounts of 16th- to 18th-century Chinese porcelain, brought by European traders, have been recovered from African sites and it is possible that there was also a trade in Oriental glass beads. Carnelian beads have been found in both Iron-Age and historic-period contexts in West Africa at sites such as Igbo-Ukwu (Shaw 1970: 230) and Elimina, Ghana. As no African source has been identified, they were presumably imported from other areas, possibly India (David Killick 1989: pers. comm.). Trace element analysis has thus far been of limited help in sourcing beads from African sites but further research in this direction may provide more information (Davison 1972; Davison and Clark 1974; cf. Karklins 1974; Sleen 1973). In particular, David Killick (1989: pers. comm.) has noted that major element analysis, especially of colorants, may prove very helpful. A study by Davison, Giaque and Clark (1971) successfully defined two groups of blue-green dichroic glass beads found in West Africa. The two groups seem to be respectively associated with Arab and European trade.

The social importance of beads in West Africa further complicates their dating as they may continue in use long after their manufacture (e.g., Cole 1975; Sackey 1985). In the past ten years, I have observed a variety of 19th-century bead types in use in ritual contexts in both Ghana and Sierra Leone. Lamb and

York noted several beads they believed could range in age from the 4th century to the 19th century which were readily available in Ghanaian markets in the early 1970s (Lamb 1978; Lamb and York 1972). I examined beads for sale in Accra, Ghana, during 1987, and found that comparable beads, as well as others identical to examples recovered from 19th-century archaeological contexts, are still available. Ghanaian markets perhaps provide the greatest variety of antique beads in West Africa, but other examples of old beads can be readily found in markets in Sierra Leone, Ivory Coast, Gambia, Togo, Nigeria, Mali and probably other West African countries. Sellers will sometimes indicate that beads have been dug up as a further recommendation of their age and worth and when pressed, some sellers I interviewed admitted to the association of the beads with burials.

A final difficulty in the study of beads as chronological indicators rests with the African material recovered. African sites have generally not produced large collections of beads and few are from closely-dated contexts. In publications, the description of many of these finds remains very basic, or nonexistent, making it difficult to compare types. Exceptions are Shaw's (1961; 1970) thorough discussions of the Dawu and Igbo-Ukwu material, though comparison is still difficult, and the Picards' recently-initiated and extremely well-illustrated series on West African beads collected from non-archaeological contexts (Picard and Picard 1986, et. seq.).

Unfortunately, despite the problems in using beads as chronological indicators, they often provide the only clue when dating sites of the second millennium A.D. Beads are sometimes the only imported commodity found, even on sites known to have been occupied to the present century. The increasing use of radiocarbon dating and the recent refinement of high precision calibration curves have been very helpful in establishing regional chronologies (McIntosh and McIntosh 1986). However, when dating sites of the past 500 years, standard deviations are too great to provide more than the broadest parameters. Even on older sites, the development of a bead chronology could assist in the evaluation of radiometric dates.

Bead research in other parts of the world, use of the Kidds' classification system, and the publication of trade-bead catalogues has facilitated the study of beads by Africanists (Karklins 1985; Karklins and

Sprague 1980; 1987; Kidd and Kidd 1983). Recent work by David Killick (1987) suggests that beads in southern and eastern Africa have similar temporal distributions to trade beads in North America during the 19th century but notes that there may be a time-lag in the appearance of new bead types during the 17th and 18th centuries. These findings suggest that the dating potential of beads from West African sites should not be negated, but carefully evaluated in terms of the data available from other parts of the world.

EXCAVATIONS AT ELMINA, GHANA

Recent excavations at the old African settlement of Elmina, Ghana, provide a unique opportunity to examine the temporal distributions of European glass trade beads in West Africa, as well as locally made beads of stone, shell, brass, ivory, bone and glass. Archaeological research was carried out at the site between September 1985 and December 1987 (De-Corse 1987a; 1987b). Elmina is of special interest as it was a major trading center between 1482, when the Portuguese founded Castle Sao Jorge da Mina, and 1873, the year the African town was destroyed by the British. The Castle was captured by the Dutch in 1637, and it remained the headquarters of Dutch mercantile interests on the Guinea Coast until the transfer of all Dutch properties to the British in 1872. There was an African settlement at Elmina prior to the arrival of the Portuguese in the 15th century but the settlement expanded rapidly as a result of its advantageous trading position. By the time the settlement was destroyed in 1873, the population probably numbered over 12,000. Survey and excavation at the old town site located over 30 structures and recovered a large assemblage of local and imported artifacts spanning the 16th to the 19th century.

Analysis of the more than 30,000 excavated beads is incomplete, but it appears that the extensive assemblage of European trade materials will provide more precise dating than is usually possible on African sites of the last 500 years. Beads were among the most ubiquitous finds at the site, and they occurred in hundreds of different contexts. Many of the recovered beads were from the 19th-century destruction layers, including many that were partially melted, possibly

having been stored in a trader's house destroyed during the 1873 British bombardment. Midden deposits, fill layers, burials, and house floors account for other occurrences. Many of these deposits can be dated on the basis of associated finds of European ceramics and glass, the dates of which are frequently known within a few years. This close chronological control provides a means of determining the temporal distributions of different bead varieties and assessing their value as chronological indicators. Preliminary examination of the Elmina collection indicates that some beads should be useful in establishing a *terminus post quem* for archaeological sites. Others may prove useful when subjected to the same seriation studies used on other artifact classes.

Comparison of some of the Elmina beads with relatively well-dated examples from catalogues and other archaeological sites indicates that they are of similar age. Research by Karlis Karklins on the "Levin Catalogue" and the "Venetian Bead Book" was particularly useful. The former is of special interest to Africanists as it contains examples of beads described as being used by traders in West Africa. Both of these bead collections were examined by Lamb and York (1972: 112) but at that time the Venetian Bead Book was erroneously assigned a date of ca. 1704. Karklins (1985: 31, 81) has placed the date of the Venetian Bead Book in the middle of the 19th century, or slightly earlier, and the Levin Catalogue between 1851 and 1869. Because the collections contain similar bead types, Lamb and York postulated long periods of manufacture for some of the beads they examined. Had they known the correct date of the Venetian Bead Book, they may have reached different conclusions. Other 19th-century catalogues have been discovered and these also provide useful comparisons. These include bead cards from the Glass Museum on Murano, Italy, the Giacomuzzi bead sample book presently at The Bead Museum in Prescott, Arizona (Francis 1988; Karklins 1984), and three sample cards in the collections of the Museum of Cultural History, University of California, Los Angeles.

Beads similar in style and manufacture to examples in these trade cards and sample books were recovered from 19th-century contexts at Elmina. There is, however, more variation in the archaeological collection. (Whenever possible, the beads are given Kidd and Kidd [1970] type/ variety codes; varieties that do

not appear in their lists are marked by an asterisk [*].) The cylindrical, opaque barn-red bead, decorated with white loops with a light gold dot in their center (Pl. IIB, R.1, #1), appears identical to beads in the Levin Catalogue: WIIIb*(f). Other WIIIb-type beads with the same color combinations but different body shape were also recovered, including small cylindrical; tubular, square-sectioned; large cylindrical; round; short barrel; and short cylindrical with convex ends (Pl. IIB, R.1, #2-7, respectively).

Additional beads pictured illustrate the wide variety of additional color combinations present within the WIIIb-type category. Plate IIB, row 2, from left to right, includes barrel-shaped beads of opaque light gold glass with a transparent bright navy on opaque white on opaque brick red on dark green band around the middle, and blue on white on red dashes on the ends; cylindrical translucent and opaque dark palm green with 15 to 24 "eyes" of transparent bright navy on opaque white on opaque redwood on opaque light gold; cylindrical opaque light gold with 9 oblong striped inlays of transparent bright navy on opaque white on bright navy, and nine transparent scarlet dots; and barrel-shaped, opaque light gold with an opaque brick red on transparent dark green stripe around the middle, and transparent bright navy on opaque white "eyes" in opaque brick-red loops on the ends.

Many of these WIIIb beads were in large concentrations of partially melted beads in 1873 destruction layers. Some are poorly represented in other contexts and may have had a limited distribution. In contrast, the apple-green bicone with compound stripes of light gold, black and barn red occurs in a wide range of 19th-century contexts, in addition to the 1873 destruction debris (Pl. IIB, R.3, #1,2; cf. Levin Catalogue: WIIIC*[k]). Most of the archaeological examples (11-13 mm diameter and 11.5-13 mm length) are smaller and lighter in color than those illustrated in the Levin Catalogue (14.3-16.5 mm diameter and 13.7-15.0 mm length). These beads are still common in Ghanaian markets and I observed several of the beads being worn during the Bakatue Festival at Elmina in 1986.

Research by Lester Ross on a type of 19th-century mould-pressed Bohemian bead indicates that these are also useful temporal markers for the 19th century. Mould-pressed beads had not been well-reported from archaeological contexts in West Africa at the time

Lamb and York wrote their article and they did not discuss their potential use as chronological indicators. The Bohemian beads which Ross describes as "mandrel pressed" are characteristically faceted and have a moulded or partially moulded hole (Ross 1974; 1988; Sprague 1985: 96). Ross (1988) suggests that early examples of these beads, dating to the second quarter of the 19th century, had conical holes which were partially punched through at the narrow end of the perforation, leaving a chipped scar. The facets were all ground. Later examples, possibly introduced in the 1860s or 1870s, have a conical hole moulded all the way through and partially-moulded facets. Late 19th- or 20th-century examples are characterized by straight holes extending all the way through the bead, and entirely moulded facets.

Elmina examples are round with an equatorial mould seam and ground facets (Karklins 1985: 101, MPIIa*). All have conical holes which appear to have been partially punched through. However, in some cases the ends have been ground flat making it impossible to determine if they had a chipped scar. The beads occur in black, opaque blue, transparent green, translucent bright turquoise, and transparent red, and in various sizes (Pl. IIB, R.3, #3-8). Such beads were recovered from 1873 destruction debris but were also found in a number of other contexts, including a large fill layer or midden deposit which contained some pre-19th-century material, but produced a mean ceramic date of circa 1846 (n=1148). None of these beads have been observed for sale in markets or in current use.

Mandrel-pressed beads were the most common type of moulded bead found at Elmina, but a number of other moulded beads were also recovered from 19th-century contexts. Two examples are illustrated in Pl. IIB (R.4, #1,2). They are oval-shaped and have ground facets (MPII**). A mould seam extends around the bead parallel to the straight-sided perforation. Techniques for moulding and pressing beads were perfected in the 19th century and machines were in common use by the early 20th century (Sprague 1985: 95-96). The dating potential of the various mould-pressed beads has not been fully explored. As data accumulate from well-dated contexts, they may provide a means of closely dating sites of the last 150 years.

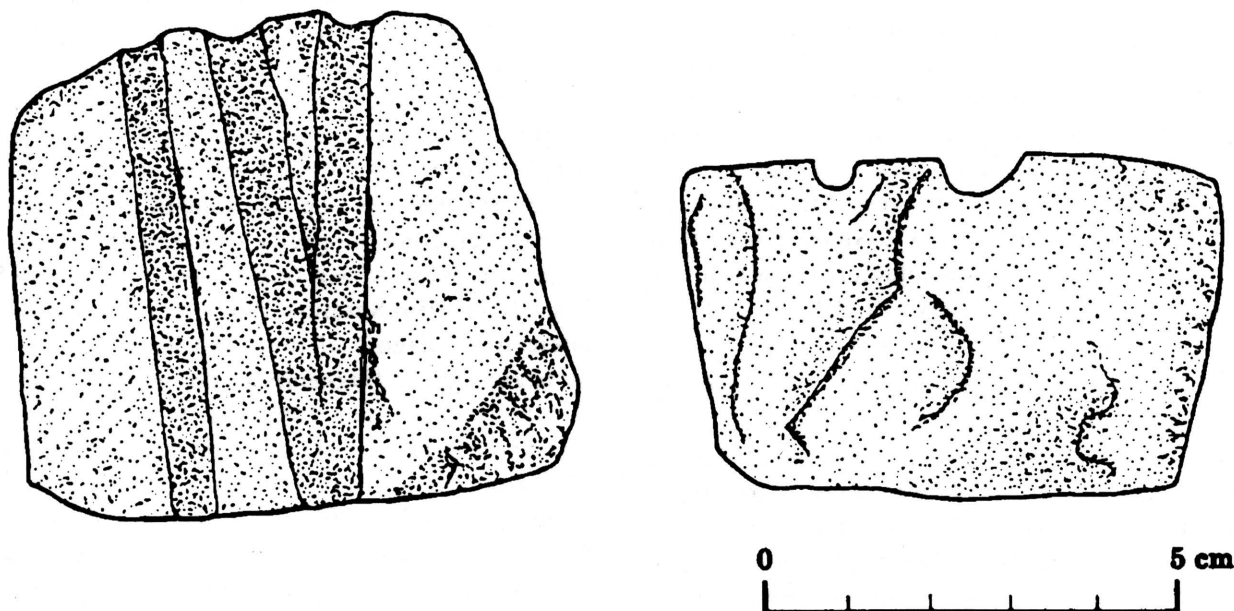


Figure 2. A sandstone bead abrader from Elmina.

The analysis of some of the earlier bead varieties from Elmina has also been completed. Some of these are not common but their presence in well-dated contexts seems to confirm that their temporal distributions are equivalent to those of similar beads found in North America. At Elmina, a wide variety of bead types were recovered from burials dating to between ca. 1700 and 1775 on the basis of associated ceramics. Four of these bead varieties are shown in Plate IIB (R.4, #3-7: IIB18; IIB'7; WId* transparent reddish amber; WIIC2). North-American occurrences of these beads mostly range between 1700 and 1830 (Brain 1979: 105, 106, 108, 110; Quimby 1966: 86-87). Examples of "gooseberries" (IIB18) are also known from ca. 1650 contexts in Florida and Alabama (Deagan 1987: 116). It is of note that "gooseberries" have also been recovered from the ca. 1700 wreck of the *Henrietta Marie*, an independent English merchant ship involved in the African slave trade (Moore 1987; 1988).

Although all four of these bead varieties are mostly known from 18th-century sites in North America, their maximum range probably extends even earlier. All have close parallels in beads produced in Amster-

dam during the 17th century (Bart 1988; Karklins 1974; Sleen 1963; 1973). Karklins (1988: pers. comm.), in his examination of material from archaeological sites in Amsterdam, noted variety IIB18 in ca. 1590-1775 contexts; WId* in 1675-1800 contexts; and WIIC2 in 1670-1750 contexts. Given the Dutch presence at Elmina it would certainly not be surprising to find examples of these beads there. As the Dutch bead industry had apparently collapsed by about 1750, the late-18th-century examples of these beads were presumably produced elsewhere, possibly in Venice, Germany, or Bohemia (Karklins 1974: 66).

AFRICAN GLASS BEADS FROM ELMINA

The Elmina excavations also provided information on the local bead industry, which included the modification of imported beads and the manufacture of local products. Little systematic work has been done on the origins and dates of African-made beads, but after further analysis they may prove to be of equal use as chronological indicators. Direct evidence of manufacturing, such as molds or wasters was not

found at Elmina, but several grooved sandstone blocks which probably served as bead abraders were recovered (Fig. 2). Similar examples have been found at other Ghanaian coastal sites such as Ankobra, Sekondi, and Winneba. These stones could have been used for polishing imported glass beads, or for grinding local beads of stone, shell or glass. All three of the latter industries survived in West Africa until the present century (Daniel 1937; Shaw 1945; Wild 1937). In fact, glass bead manufacture remains a very active cottage industry today (Pl. IIB, R.7, # 5-8; Lamb 1976; Liu 1974; Sordinas 1965).

Archaeological evidence for local bead manufacture has been found at sites in both Ghana and Nigeria. Posnansky (1987: pers. comm.) uncovered wasters from the manufacture of drawn beads at the Begho excavations which, on the basis of radiocarbon determinations, are believed to date to the 17th or early 18th century. Early evidence for the reworking of beads comes from Ife, Nigeria, where Willett (1977: 16-22) uncovered wasters which he dates to between the 8th and 12th centuries. Beads made from firing powdered glass are best known from ethnographic accounts of Ghanaian craftsmen, but this type of bead is widely distributed in West Africa and several different industries of unknown ancestry are represented (cf. Bowdich 1966: 268; Connah 1975: 167, 170; Delarozière 1985: 41-44; Krieger 1943; Lamb 1976: 34; Sinclair 1939; Sordinas 1964). All of these beadmaking traditions were presumably dependent on imported sources of glass, but there is a tenuous hypothesis that silica slag from iron smelting could have been used for the manufacture of beads (Landewijk 1970: 96; cf. Kalous 1979).

Despite the evidence for early West African bead industries, European writers provide little information. In the early 16th century, the Portuguese purchased *coris* on the lower Guinea Coast and brought them to Elmina where they were polished, drilled and strung for sale. John Vogt considers *coris* to be a type of stone bead in this case (Daaku and Van Dantzic 1966: 15; Vogt 1973: 462; 1979: 70). De Marees (1987: 53, 54, 80, 84), in his early-17th-century account, indicates that the polishing and modification of imported glass beads was a common practice in coastal Ghana. Aside from these notes, and other enigmatic references to *akori* beads, there appear to be no references to the manufacture of local glass beads.

Imported beads which were probably modified locally were recovered at Elmina supporting de Marees' comments. Many beads show evidence of grinding (e.g., Pl. IIB, R.3, #2; R.5, #1-4), and some of the drawn beads appear to have been cut into shorter lengths. The grinding and reworking of beads has been noted in other collections from West Africa (Picard and Picard 1986: 3). The reheating of European beads to alter their color or opacity also seems to have a long history in West Africa (e.g., Davison, Giauque and Clark 1971: 654; Sordinas 1964). At Elmina, the most interesting category of reworked beads is that made by heating glass fragments to the melting point and then perforating them with some type of pointed implement (Pl. IIB, R.5, #2). The majority of these were made from broken European beads, but there are some examples of perforated glass fragments (Pl. IIB, R.5, #3). There are also intact drawn beads with a second hole pushed through, perpendicular to the original perforation (Pl. IIB, R.5, #5). Some bead fragments have smooth perforations, probably made by some type of drill (Pl. IIB, R.5, #4).

A large variety of clearly non-European beads which exhibit a wide range of decorative effects was found at Elmina. Unfortunately, given the current state of research, it is not possible to be certain where these originated. There was an active trade along the West African coast and beads from Nigeria or other areas could easily have reached Ghana (Law 1983). Most of the recovered examples were made by firing glass chips or powdered glass, techniques analogous to the mode of manufacture still used in Ghana. None of the obviously locally made beads were drawn like the examples from Begho, but the collection is still under study.

The two most common types of fired beads are shown in Plate IIB. These represent beads made from glass chips (R.6, #1-4), and beads made from powdered glass (R.6, #5-7; R.7, #1-2). Both types occur in contexts dated to the 18th century, or earlier, on the basis of associated ceramics. The examples made from chips are mostly white and blue, or blue-green glass, but examples with yellow and brick red glass fragments were also found (Pl. IIB, R.6, #1). The perforations in these beads are irregularly shaped and noticeably tapered, similar to the holes in the locally-perforated fragments of imported beads. After perforation, the beads were generally ground. In some

examples (Pl. IIB, R.6, #4), the beads appear to have been turned in the mold while still molten and some of the glass has swirled together giving the beads a wound appearance. A few beads seem to have been made by winding viscous shards of glass around a mandrel. Beads similar to these varieties have been recovered from possible 17th-century contexts at other Ghanaian sites, including New Buipe in northern Ghana (Lamb 1978) and Twifo Heman, located 65 km north of Elmina on an important trade route to Kumasi (Bellis 1972: 85).

Perforations in the powder-glass beads are smooth and irregularly shaped. Most of the recovered examples seem to have been light gold in color originally, but weathering has in some cases made them a yellowish-tan. The decorated beads have inlays of trailed glass and/or fired glass chips of pale blue, navy blue, black, white, and brick red. They appear similar to types sometimes referred to as *akosu* (Lamb 1976). They do not have the grey or black core which characterizes the category of beads known as *bodom* (Dubin 1987: 123; Lamb 1976). Examples of this latter type of bead may also have been found at Elmina but they are, as yet, unanalyzed.

Various non-European beads also occur in 19th-century contexts. Some of these are certainly the forerunners of the fired beads still produced in Ghana today, but there are also examples of wound beads of uncertain origin. A type of wound bead is presently made in Bida, Nigeria, but none of the beads examined parallel those from Elmina (Dubin 1987: 123; Nadel 1940). The most ubiquitous of the Elmina varieties are undecorated opaque yellowish-green, barrel-shaped beads (Wib*) of which 690 examples were recovered. These were found in mixed contexts containing both 19th-century and earlier material, but well-dated contexts seem confined to 19th-century features. Some of the beads have well-smoothed surfaces but most are very weathered (Pl. IIB, R.7, #3-4). Future research will, perhaps, clarify the origins of these beads.

BEADS NOT RECOVERED AT ELMINA

A survey of bead types *not* found in the Elmina assemblage also provides some clues regarding the temporal distributions of beads. As more than 400 bead types were found, it is notable that none of the

more elaborate, so-called mosaic beads are represented. Their absence may be the result of cultural bias but many of these beads are common in present-day Ghanaian markets where they do not command the same high price as some of the recognizably older beads. As the town's destruction in 1873 provides an excellent *terminus ante quem* for the Elmina material, the absence of the mosaic beads supports Karlis Kariklins' (1988: pers. comm.) suggestion that they are primarily 20th-century products. His supposition is based in part on the examination of over 10,000 ethnographic photographs taken in Africa before 1935. In all these photographs, there is only one which *may* show a mosaic bead being worn. In contrast, these beads feature prominently in collections of recent African trade beads (Harris 1984; Shumway 1973).

CONCLUSIONS

The preceding discussion suggests that the negative conclusions reached by Lamb and York need to be reconsidered. The Elmina site provides a wide variety of beads from relatively well-dated contexts and these data indicate that some bead types of the 17th through 20th centuries may be useful dating tools. Beads may also prove to be helpful in differentiating pre- from post-European-contact sites. While by no means conclusive, comparison of the Igbo-Ukwu beads with material from early Spanish sites in the New World tends to confirm the pre-European context of the former.

Lamb and York examined only six varieties of European trade beads in their 1972 article and a great deal of additional information has come to light since then. Nevertheless, it is still important to consider some of the points they made. The ritual and social importance of beads does, at least in some cases, keep beads in circulation long after their period of manufacture and the full temporal distributions of many beads are still unknown. Occurrences of one or two beads cannot be used to build a chronology for an entire site. As with other dating methods, beads should be only one resource to be considered, and are best used in combination with other techniques.

The data on Elmina discussed here are limited in some respects. As a large portion of the recovered beads is from 19th-century contexts, the absence of

less-common bead varieties from earlier periods could be a result of sample size. Furthermore, the factors affecting the distribution of beads in other parts of West Africa are currently unknown and the data discussed here can only be applied tentatively to other sites. Even sites close in both time and space may present quite different bead assemblages. This is illustrated by the beads recovered by Calvocoressi (1977) at Veersche Schans (Fort de Veer), Bantoma. This small redoubt was located at the landward side of the Elmina peninsula and served as part of the western defenses of Elmina town. Calvocoressi's work concentrated on the redoubt but he exposed 15 burials, two of which produced a total of 5199 beads (Calvocoressi 1977: 130). The burials predate the 1811 construction of the redoubt and can probably be dated to the 18th century. Although the beads have counterparts in Elmina assemblages of seemingly comparable age, the relative frequencies are different. The vast majority of the Bantoma beads are small (2-4 mm) or very small (< 2 mm) in size. The wide assortment of large (6-10 mm) and very large (> 10 mm) beads which forms a significant portion of the Elmina assemblage is all but absent. Without more information on the contexts of the beads at both Bantoma and Elmina, it is not possible to determine if this disparity is due to the date of the deposits, or the sex, ethnicity, age, social status or personal preference of the original owners.

Beads exported to different areas of Africa at different times doubtlessly varied. However, some of the Elmina beads are represented at other sites in West Africa. For example, the blue mandrel-pressed Bohemian beads were the most common variety recovered during an archaeological survey of defensive sites around Kabala in northeastern Sierra Leone (DeCorse 1980; 1981). Oral histories and documentary sources indicate that these settlements were established during the late 18th century with the principal occupation occurring during the 19th century. The recovered mandrel-pressed beads, European ceramics and English gunflints were useful in confirming the dates of the sites.

There is clearly a need for more research. However, preliminary analysis of the Elmina material illustrates the dating potential of beads. Seriation

studies of beads from well-dated contexts at Elmina and elsewhere may be helpful in resolving some of the questions about the life-spans of beads. Killick's (1987) simple presence/absence seriation of beads from five independently-dated southern African sites provided the correct chronological ordering, illustrating the potential importance of this type of analysis. Continued analysis of the Elmina collection, better descriptions of other West African bead collections, and additional documentary research will, it is to be hoped, provide a clearer framework for the dating of beads.

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COLOR PLATE CAPTIONS

- Pl. IA. *Diakhité*: Beads of stone, shell and metal. **R.1**: rock crystal (quartz). **R.2-3**: carnelian. **R.4**: carnelian and amber. **R.5**: shell. **R.6**: metal (all *Diakhité* photos by H. Opper).
- Pl. IB. *Diakhité*: Glass beads. **R.1-2**: drawn chevron. **R.3-4**: decorated wound. **R.5**: decorated drawn and wound. **R.6**: faceted and striped drawn. **R.7**: multi-faceted drawn and decorated wound. **R.8**: ruby-colored wound. **R.9**: assorted wound and drawn. **R.10**: drawn multi-layered. **R.11**: drawn "seed" beads.
- Pl. IC. *Diakhité*: Glass beads and metal ornaments. **R.1-5**: assorted monochrome wound beads. **R.6**: metal ornaments.
- Pl. ID. *Fustat (Old Cairo)*: Medieval and modern beads donated to the Islamic Museum, Cairo, around 1920 by Fouad, the penultimate monarch of Egypt and father of Farouk. The large bead at the upper left is stone; the other beads at the top are medieval glass. The first strand is of Fustat Fused Rod beads, with green jasper cornerless cubes and a heart pendant in the center. The second strand is composed mostly of Venetian lamp beads, but the mosaic beads are Early Islamic. The third strand is mostly Early Islamic, but the translucent red beads are Venetian (photo by P. Francis).
- Pl. IIA. *Fustat (Old Cairo)*: Drawn polychrome and mosaic wasters in the Islamic Museum, donated by Dr. Fouqi. Two fused mosaic cane beads are in the center (photo by P. Francis).
- Pl. IIB. *Elmina*: Diagnostic glass beads: **R.1-2**; **R.3**, #1,2: 19th-century wound beads. **R.3**, #3-8: 19th-century mandrel-pressed beads. **R.4**, #1,2: 19th-century moulded beads. **R.4**, #3-7: pre-19th-century bead varieties. **R.5**: imported beads and glass shards modified locally. **R.6**, #1-4: beads manufactured from glass chips. **R.6**, #5-7; **R.7**, #1,2: powdered-glass beads with glass-chip and trailed-glass decoration. **R.7**, #3,4: 19th-century non-European wound beads. **R.7**, #5-8: 20th-century powdered-glass beads (this and the following photos by R. Chan and K. Karklins).
- Pl. IIC. *St. Eustatius*: Drawn beads. **R.1**: 1, Ia2; 2, Ia*(a); 3, Ia19; 4, IIA6. **R.2**: 1-2, IIA7; 3-4, IIA*(a); 5, IIA12; 6, IIA19; 7, IIA27; 8, IIA*(b); 9, IIA*(e); 10, IIA*(d). **R.3**: 1, IIA*(c); 2, IIA41; 3, IIA*(f); 4, IIA55; 5, IIA56; 6, IIB*(a). **R.4**: 1, IIBb*(a); 2, IIIa1; 3, IIIa3; 4, IIB*(a); 5, IVA5.
- Pl. IIIA. *St. Eustatius*: Drawn faceted beads. **R.1**: 1-2, Ic*(a); 3-4, If*(a); 5, If1; 6, If2; 7, If*(c). **R.2**: 1, If*(d); 2, If*(f); 3, If*(g); 4, If*(h). **R.3**: 1, If*(b); 2, If*(e); 3-4, IIIf2; 5-6, IIIf*(c). **R.4**: 1-2, IIIf*(b); 3, IIIf*(d); 4, IIf*(a); 5, IIf*(b).
- Pl. IIIB. *St. Eustatius*: Wound glass beads of simple shapes. **R.1**: 1, WIa1; 2, WIb*(a); 3, WIb1; 4, WIb4; 5-6, WIb11. **R.2**: 1-3, WIb16; 4, WIC3. **R.3**: 1, WIC11; 2-3, WIC*(a). **R.4**: 1, WId*(a); 2, WId*(d); 3, WId*(b); 4, WId1; 5, WId*(c); 6-7, WId*(e).
- Pl. IIIC. *St. Eustatius*: Wound glass beads with complex shapes, multiple layers or decorated surfaces. **R.1**: 1-2, WIIB*(a); 3, WIIC2; 4, WIIC3; 5, WIIC12. **R.2**: 1-4, WIIf*(d). **R.3**: 1, WIIf*(c); 2, WIIf*(e); 3, WIIf*(a); 4, WIIf*(a); 5, WIIf*(a). **R.4**: 1, WIIf*(b); 2, WIIf*(b); 3-4, WIIf*(a).
- Pl. IIID. *St. Eustatius*: Mould-pressed and Prosser-moulded glass beads, and beads of coral and carnelian. **R.1**: 1, MPII*(a); 2, MPIIa*(a); 3, MPIIa*(b); 4, MPIIa*(c). **R.2**: 1, MPII*(a); 2, MPII*(b); 3, MPII*(c). **R.3**: 1, PM*(a); 2-3, coral; 4, carnelian.

Plate IIB. *Elmina*: Diagnostic glass beads.

