from the late 18th through to the early 20th century have been analyzed at the SLOWPOKE Reactor Facility, of this reasonably large sampling, only the faceted beads listed in Table 1 have the potassium-lime composition so typical of Bohemian glass.

There may be slight differences between the drawn and mold-pressed beads (Table 1), although there are too few bead samples to permit firm conclusions. Drawn beads are very consistent in their chemistries; in contrast, the mold-pressed beads, even though all from the same site, are more variable, especially in their sodium content. Two beads (nos. 9 and 11) have nearly equal amounts of potassium and sodium alkalis. Such a mixed alkali composition was sometimes recommended for Bohemian glass because the resulting glass was easier to work (Lock 1881:1067). This property would be especially important for mold-pressed beads since they were largely produced by a cottage industry using primitive equipment. There is another possible source of variability in mold-pressed beads: they were made from glass rods sometimes produced from remelted factory scraps (Schwarz 1886:350). It is unlikely that such waste glass would be very uniform in its chemical composition.

This study, although brief and limited, confirms that the drawn-faceted and mold-pressed beads have chemical compositions similar to the potassium-rich glass characteristic of Bohemia. Such a similarity, however, can not be taken as conclusive proof that the beads are, in fact, from Bohemia since "Bohemian glass," as noted above, was also made elsewhere.

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52. EUROPEAN TRADE BEADS IN SOUTHERN AFRICA, by David Killick (1987, 10:3-9)

Archaeologists in southern Africa have long been interested in imported glass beads as a means of dating archaeological sites. The earliest study of which I am aware is that of Sir Hercules Read, who examined beads from David Randall-McIver's 1905 excavations in Rhodesia (Randall-McIver 1906). The next generation of archaeologists were able to call upon the expertise of Horace Beck, whose bead reports for the important sites of Zimbabwe (Caton-Thompson 1929) and Mapungubwe (Fouché 1937) were models of their kind. But the best efforts of Beck and his successors failed to establish bead studies as a dependable and precise means of dating archaeological sites. The first radiocarbon dates for southern Africa were released in 1959, and few bead studies of substance have been made since that time. An exception is Claire Davison's massive dissertation on the major- and trace-element chemistry of African beads (Davison 1972), which was a bold (if unsuccessful) attempt to establish the region of manufacture of several major groups of beads recovered from African archaeological sites.

Glass bead assemblages may yet have an important role to play in dating sites of the historic Iron Age in southern Africa. I consider the historic Iron Age to begin in A.D. 1488, when Portuguese ships first rounded the southern tip of Africa and passed into the Indian Ocean. They were followed in turn by Dutch, French, and English traders and colonists, who have bequeathed to us a vast archive of documentary records on their interactions with African peoples.

Unfortunately, the geographical coverage of these documents is limited to the relatively small zone of European influence in present South Africa, along the East African coast, and for a short distance either side of the Zambezi River valley. Eye-witness accounts of the African interior are rare before the 19th century.

It has until recently been impossible to date archaeological sites of the historic Iron Age with adequate precision. There have been major fluctuations of the radiocarbon content of the atmosphere during the last 500 years, and radiocarbon dates in this range will therefore intersect the calibration curves in several places. With conventional radiocarbon dates (standard deviation 50-100 years) the calibrated ages usually merge to give a possible age range of 150-300 years. The very recent arrival of high-precision radiocarbon dating and calibration (standard deviation 10-20 years) promises to provide the chronological framework that has so far been lacking. High-precision dates will still intersect the calibration curve in several places, but the calibrated age ranges will in most cases be discrete. It will therefore be necessary to turn to secondary evidence to decide which of the calibrated age ranges is the correct one. The most useful source of secondary evidence on southern African archaeological sites is European glass trade beads.

Two major obstacles stand in the way of bead researchers in southern Africa. The first is that no common typology has emerged, so that it is difficult or impossible to correlate published bead assemblages. I am currently trying to persuade southern African bead researchers to adopt the Kidd typology (Kidd and Kidd 1970), as modified by Karklins (1982). Many of the bead varieties recovered in southern African sites of the 17th, 18th, and 19th centuries are already included in the Kidd typology, as the same varieties were exported from Europe to North America. The period of peak popularity of a given variety is not necessarily the same in Africa and North America, but Africanists can and should use the North American bead literature to infer the probable life-span of bead varieties.

My impression (from a preliminary study of the published evidence) is that changes in bead variety and relative frequency are roughly contemporary in southern Africa and North America during the 19th century. During the 18th and 17th centuries, new varieties seem to appear later in southern Africa than in North America. An interesting duality is evident in 17th- and 16th-century sites. Bead assemblages from these levels in the Portuguese site of Fort Jesus, on the Kenya coast, have yielded large numbers of European trade beads (Kirkman 1974). Yet the bead assemblages from contemporary Portuguese trading posts in the interior, such as Luanze (ca. 1580-1680) and Dambarare (ca. 1600-1693), are dominated by non-European bead types. The reason for this disparity is given in contemporary Portuguese documents. The inhabitants of the interior regions would not accept European beads in exchange for their gold. The Portuguese were forced to import from India the same types of cloth and beads that their Swahili and Indian predecessors in the interior had employed (Garlake 1969).

There are as yet few independently dated assemblages of glass beads from southern and eastern Africa. A particularly important series of bead assemblages was recovered from Fort Jesus, where they are dated by association with coins and Chinese ceramics. They range in age from the late 16th to the late 19th century. The published analyses of these assemblages are quite inadequate, and a new and more thorough study is required. The same is unfortunately true of most other independently dated bead assemblages in eastern and southern Africa, such as that from the Zulu capital of Mgungundhlovu (1829-1838). The number of independently dated "control" assemblages is, in any case, small, and needs to be augmented by excavation and analysis of sites of known age. Current work on the historical archaeology of Cape Town should provide a number of bead assemblages that can be dated by association with imported coins and ceramics. Several large bead assemblages have recently been excavated from a series of Zulu royal settlements, the ages and duration of which are established by documents.

In 1982 and 1983, I excavated five bead assemblages from the Kasungu National Park in central Malawi, as part of a study of changes in settlement pattern during the 18th and 19th centuries. Three of the assemblages are firmly dated to the period 1860-1900 by specific oral histories, cross-checked with several different informants. Sites IpIc-9 (which produced only 20 beads) and site IoId-2 (2,301 beads) were both abandoned by about 1880; site IpId-1 (691 beads) was occupied until 1897. The common beads of each of these sites are: drawn transparent scarlet over opaque white to pink large barrels and small "seed" beads (Kidd types IVa*, IVa9; "cornaline d'Aleppo"); small to very small (1.0-2.5 mm) drawn opaque "seed" beads in neutral white (IIa13), light aqua to turquoise (IIa40 ?), bright sky blue (IIa*), pale to vivid pink (IIa*), redwood with a clear outer coat (IIal ?), Dutch blue (IIa*), bright navy (IIa*), and royal blue (IIa*); and drawn short tubular or barrel beads of monochrome opaque white to translucent light grey (variable). Wound beads are very uncommon; among them are a very large barrel of very pale blue glass (WIc3), large annulars of transparent royal blue (WId*), and medium barrels or ellipsoids of transparent scarlet over opaque white or pale pink (WIIIa*). There is a single example of a large barrel bead with a wound transparent scarlet exterior over a drawn core of colorless glass (Karklins class WDI). Mould-pressed beads in opaque white and Dutch blue, with a distinct equatorial ridge (Karklins MPIa*) were recorded only at IpId-l, which is the latest site. There are no twisted, faceted, or inlaid beads at all.

The fourth site, IpIc-2, produced 88 beads. It is not firmly dated, but the bead assemblage is very similar to the three described above, so it is probably of about the same age. The fifth site, IpIc-12, is definitely older. Beads were relatively scarce on this site; the volume of midden deposit excavated was the same as on site IpId-l, but only 18 glass and 1 shell bead were recovered. There is a radiocarbon date, in good association, of 150±40 b.p., which gives a calibrated age at 95% probability of A.D. 1660-1820. There are no other imported goods, but a comparison of the local ceramics with others from Malawi suggests that this is probably a late 18th-century assemblage. The assemblage contains ten drawn tubular beads with a thin outer layer of transparent oyster white over a core of translucent light grey or opaque oyster white glass (IIIa*). The outer layer is usually crazed; they are usually called "crackled whites" in the African bead literature. There are three drawn tubular beads of transparent bright navy (Ia19) or dark navy (Ia20), two tubular beads of opaque redwood over transparent apple green (IIIa3), and three nondescript opaque white monochrome beads. The association of tubular red-on-green, transparent blue and "crackled white" is one that has been often reported in southern Africa. There are no firm dates for any of these assemblages, but they are most probably of the late l8th or early 19th century. There is only one reported assemblage in which drawn red-on-green and scarlet-on-white varieties both occur in substantial numbers; this is the Zulu site of Mgungundhlovu (1829-1838). This suggests that the transition between these important marker varieties in southern Africa is probably about 1830, which is the date given by Sprague (1985) for the first appearance of drawn scarlet-on-white beads in North America.

A simple presence/absence seriation by bead type places these five sites in correct historical order. This suggests to me that the seriation of glass bead assemblages, tied at intervals to high-precision radiocarbon dates, may provide the essential chronological skeleton for regional studies of the historic Iron Age in southern Africa.

Acknowledgements

I am most grateful to Karlis Karklins for examining some of the Kasungu beads, and to Robin Derricourt and to Jill Kinahan for access to their unpublished data on African beads.

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