The Elemental Analysis of Glass Beads

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Chapter 2
Glass beads and human pasts

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1. Introduction

Beads are amongst the oldest artifacts associated with modern humans (Bar-Yosef Mayer and Bosch 2019). Early shell and eggshell beads found at Middle Stone Age sites in Africa and Middle Paleolithic sites in Israel have been interpreted as examples for symbolic thinking, social signaling, and long-distance transportation of bead materials (Bar-Yosef Mayer et al. 2020; Steele et al. 2019). When glass was developed in the Middle East around 2500 BCE, beads were some of the first objects produced from this new technology (Henderson 2013:8; Moorey 1985). This long-standing and intimate connection between beads and humans makes them ideal objects for addressing a variety of anthropological questions related to their manufacture, trade, use, and meaning. In this chapter, we review a variety of case studies that demonstrate how glass beads in particular have been used to examine trade and economic systems, intercultural interactions and colonialism, social identity, and technological practices.

2. Technological practices

As archaeologists well understand, technological practices are social practices (Dobres 2000, 2010; Killick 2004; Pfaffengerger 1988, 1992) and a detailed understanding of bead production technology can illuminate social practices within a number of different arenas. Glass beads are important as objects in the social world both because they are beads—objects of adornment and exchange (Loren 2010; Spector 1976)—and because they are made of glass. Glass, as a material, is often desired and revered due to its specific properties, including shininess, brightness,

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smoothness, hardness, and reflectiveness, among other characteristics (Hamell 1983, 1987, 1992; Miller and Hamell 1986). Most commonly, investigations of beadmaking technologies are used to identify bead sources of manufacture, to build chronologies, and to establish connections between places of production and places of consumption. In some cases, the use of beads as chronological indicators can spur scholars to rethink traditional timelines and historical events (see Dalton-Carriger and Blair, this volume).

Studies of beadmaking technological practices, however, can also be used to examine social practices among bead makers, and others involved in the production side of the bead-making equation. As Francis (1994) has argued, studying beads and the technology of production can allow researchers to investigate historical migrations, technological organization, the social processes of learning, and social statuses among artisans and craft producers at multiple scales. Detailed studies of bead technology, combined with a theoretical and methodological approach grounded in the concept of object itinerary or object biography (Blair 2015), can also be used to explore social relationships among bead consumers (Blair 2017).

The study of glass beadmaking technological practices includes both the manufacture of glass, including obtaining the raw materials (Henderson 1985; Jackson et al. 2005; Jacoby 1993; Moretti and Hreglich 2013), and the production of beads from that medium, either by hot or cold working. The study of glassmaking has a long and robust history (e.g., Brill 1970; Brill 1988; Brill and Stapleton 2012; Caley 1962; Henderson 2013; McCray 1998; Turner 1956) and includes the examination of many objects other than beads. It is also a multidisciplinary endeavor, with the dynamics of glass production being investigated through historical documentation (such as glass recipe books) (Neri 1612; Toninato and Moretti 1992; Zecchin 1986), archaeological investigations of glass production sites (Cavalieri and Giumlia-Mair 2009; Hulst et al. 2012; Lankton et al. 2008), and through a variety of analytical techniques (Bonneau et al. 2014), including LA-ICP-MS, the subject of this volume.

Glass beads can be manufactured using a variety of methods (e.g., winding, drawing, molding, lapidary techniques). The diverse technological practices of bead manufacture have also been examined using many of the same sources of information as for glass manufacture: archaeological, documentary, and ethnoarchaeological, and materials science-based approaches (e.g., Kanungo 2000, 2004). In many cases, the raw glass producers and glass bead-makers were different communities, and glass bead-makers could use raw glass from multiple sources (see Trivedi and Dussubieux, this volume). While the two technological sides of glass bead making are often investigated independently, linking the multiple steps of the manufacturing process, often through the use of the concepts of chaîne opératoire
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Glass beads and bead production “communities of practice,” has proven to provide powerful insights into the social dimensions of bead making technological processes (Blair 2015, 2016; Kelly 2016). For European glass and bead production, historical documentation of craft guilds combined with morphological investigations of the products of these guilds have provided rich descriptions of the social organization of craft production (Epstein and Prak 2008; Karklins 1993; McCray 1999a, 1999b; Trivellato 2006).

Babalola (2017; Babalola et al. 2018) likewise integrated multiple lines of evidence through his analysis of historical accounts and excavated glass beads and production material from the site of Igbo Olokun, in Ile-Ife, Nigeria. By combining excavation data and morphological analysis of glass beads and bead making debris with compositional analyses of beads and glass-lined crucible fragments, Babalola and colleagues identified the earliest recognized glass-making and bead-making locale in Sub-Saharan Africa. In addition to identifying and describing the technology of a previously unknown beadmaking center, this research also situated this glassmaking center as a key-driver for broader social changes in Yorubaland (Babalola 2017).

The practices of bead production also occurred in less formal settings and in some cases factory-made beads were transformed by grinding and refiring, and pieces of glass could be reworked or repurposed into new forms. Examples include the production of pendants out of remelted glass beads in North America (Walder 2013), the production of beads made by firing powdered glass and glass chips in West Africa (DeCorse 1989), and the reheating and molding of Indian Ocean glass beads in 11th century CE South Africa (Wood 2011; see also Klehm and Dussubieux, this volume, Figure 15.1). The study of such (re)production of beads is an important window into material tastes and the social practices of bead consumption.

3. Trade and economic systems

Due to their portability and durability in the archaeological record, glass beads have frequently been used to identify and examine ancient trade, interaction, and economic systems. At the most basic level, the appearance of glass beads can be a marker of contact and intercultural interaction between two regions, and changing styles of glass beads has facilitated their use as temporal markers (e.g., Bellina and Glover 2004; DeCorse 1989; Karklins 2012; Kidd and Kidd 2012; Spector 1976; Wood 2011). However, the examination of glass bead compositions has allowed for a more in-depth consideration of trade and economic networks through the identification of glass recipes that can be associated with specific
workshops or glass production traditions. Many of the chapters in this volume use beads to deepen understandings about long-distance, regional, and local exchange networks (see Aldenderfer and Dussubieux, this volume; Hawkins and Walder, this volume; Klehm and Dussubieux, this volume; Trombetta et al., this volume; Wood et al., this volume). In several cases, the use of LA-ICP-MS has facilitated the identification of sub-groups of glass types, which can also be differentiated chronologically and regionally (e.g., Dussubieux et al. 2010; Trivedi and Dussubieux, this volume). Compositional analysis using LA-ICP-MS is also useful for identifying different bead types and groups that are not obvious based on visual typologies or style (see Blair and Dussubieux, this volume; Larson and Dussubieux, this volume; Panich et al., this volume). In these cases, scholars are able to move beyond simplistic identification of connections between two regions to learn about the particular communities that may have come in contact with one another and how economic networks were organized.

In Southeast Asia small, monochromatic, drawn beads, sometimes called Indo-Pacific beads are ubiquitous at many sites dating from 500 BCE – to the second millennium CE (Francis 1990) (Figure 2.1). These beads look similar to one another, but compositional studies have identified numerous different recipes associated with different world areas and workshops (Carter 2016; Dussubieux and Gratuze 2013; Dussubieux et al. 2012; Lankton and Dussubieux 2013). Glass compositions from the sites of Khao Sam Kaeo and Khao Sek on the Thai peninsula are similar to glass produced at the site of Kopia in northern India (Dussubieux and Kanungo 2013; Dussubieux and Bellina 2017; Dussubieux and Bellina 2018). Elsewhere on the Thai peninsula at the site of Phu Khao Thong, glass recipes show affinities with objects produced at the site of Arikamedu in South India (Dussubieux et al. 2012). Studies of glass beads within mainland Southeast Asia have identified multiple intraregional exchange networks that linked different communities on the coasts and inland areas, and which shifted over time (Carter 2015; Carter et al. 2021; Dussubieux and Bellina 2018). Through the identification of specific bead recipes, archaeologists are able to move beyond one-dimensional interpretations that recognize glass beads merely as objects that represent contact with India, and instead have identified diverse economic networks linking different parts of South Asia and Southeast Asia, as well as more closely examining how different types of beads circulated within internal exchange networks.

Similarly, compositional studies of glass beads in southern and eastern Africa have elucidated the dynamic trade networks between these areas and the Indian Ocean region, including the aforementioned Indo-Pacific beads. The rise of Islam and breakdown of preexisting Sassanian exchange networks in the ancient world created an opportunity for traders from South or Southeast Asia, and from the
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Middle East, to seek products such as gold and ivory. Glass beads associated with South Asian and Southeast Asian bead production appear at sites on the east African coast during the mid-late first millennium CE (Wood et al. 2017). Different bead types at sites in east and southern Africa demonstrate how participation in Indian Ocean exchange networks varied through time in these two areas (Wood 2015). Previously, it had been assumed that glass beads found in southern Africa in the first millennium were being traded inland via east African ports (Wood 2015). However, compositional studies reveal evidence for more direct trade between southern Africa and the Middle East, with glass beads likely from the Persian Gulf region found not only on the Mozambiquean coast (e.g., Wood 2015), but also nearly a thousand kilometers inland (e.g., Denbow et al. 2015; Klehm and Dussubieux, this volume). In these cases, beads are material indicators of diverse economic networks that are frequently tied to and affected by regional historic events (Robertshaw et al. 2010; Wood 2016).

Fig. 2.1: Example of Indo-Pacific beads from the site of Angkor Borei, Cambodia. Photo by Alison Carter.

Studies of glass beads can also clarify smaller scale exchange and economic networks, emphasizing the importance of understanding the local cultural contexts of these interactions. In the Arnhem Land region of northern Australia, a study of glass beads dating to the period of Macassan and European contact,
primarily post-1800 CE, has been used as evidence not just for contact between foreigners and Australian aboriginal communities, but also for understanding the economic activities between these groups (Wesley and Litster 2016). During this period, aboriginal groups were paid in material goods for their labor. Therefore, the presence of glass beads was not just evidence for contact or gifting between communities, but a material indicator of aboriginal participation in foreign maritime or colonial economic systems (Wesley and Litster 2016: 12).

4. Glass beads and colonial encounters

Glass beads are also important artifacts for studying a more specific kind of intercultural interaction: colonial encounters amongst Europeans and Indigenous communities. Glass beads were often intended to cross cultural boundaries, and the concept of “itineraries” serves as a useful way to envision the routes along which glass beads traveled throughout the world and the complex and overlapping values and meanings they accrued along the way (Blair 2015). Most of the glass beads associated with the spread of European colonialism were manufactured on the continent, with glass bead production centers such as Bohemia, Holland, and most famously Venice and Murano (Karklins 2012; Panini 2017; however see Fenn et al., this volume, for Chinese glass beads in North America). In Europe, glass beads remained a viable export business into the late 19th and earlier 20th centuries, supplying markets in North America, India, Africa, and the Pacific (Allen et al. 2018).

Worldwide, agents of numerous colonial powers used glass beads to facilitate initial contacts with local Indigenous groups. In the American Southeast and the Caribbean, for example, beads were a common component of early colonial “gift kits” intended to secure friendly relations with various Native peoples (Keelhnen and Mol 2020). Centuries later in western North America, Spanish missionaries, Russian merchants, Euro-American trappers, and explorers flying various flags all carried glass beads as commodities that could be presented to tribes throughout California and the Pacific Northwest (Crull 1997; Panich et al., this volume) (Figure 2.2). Similarly, the British brought glass beads with them to Australia during the initial founding of their penal colony (Litster et al. 2018). In these contexts, beads—along with materials such as cloth and tobacco—served to facilitate social interactions during early encounters between Indigenous people and European colonists.
In time, Indigenous communities and colonists established more formal expectations about the role of beads, which in many cases served as a form of currency. While glass beads were certainly a medium of exchange, the term “trade bead” often carries the negative implication that colonists and Indigenous communities were not in fact operating on a level playing field with regard to the inherent value of the glass beads in question. Yet, the actual value of glass beads for Indigenous people was a complex proposition (Loren 2013; Miller and Hamell 1986; Moffett and Chirikure 2016). In many cases, glass beads slid easily into existing economic and adornment practices involving beads made from shell, stone, ceramic, or bone—sometimes even being used to replicate specific patterns, such as those created by Meskwaki ribbon workers (Ackerman 2008). But as suggested by Turgeon (2004), the symbolic value of glass beads may have in part derived from their status as foreign objects, or difficult to obtain. Thus, as Stahl (2002:841) argues for the Banda region of Ghana, “the desirability of imported forms was likely predicated on the existing practices of taste for beads, which were subsequently transformed by the incorporation of new bead forms.” No clearer does this transformation take place than in east and southern Africa, where early 16th century Portuguese traders encountered their African counterparts wishing to trade not just for glass beads, but glass beads produced in South Asia, and refusing in turn to accept European glass. During the colonial period, the importance of glass beads and their origins
shift dramatically, being offered as tokens to entice African children to attend missionary school (Klehm 2014; Klehm 2017:630).

Indigenous communities, moreover, were not passive recipients of glass beads, but rather drove the distribution of particular bead types across the globe. As noted by Panini (2017:19), Venetian bead producers responded to the tastes of people living in Africa, Asia, and the Americas for glass beads of particular shapes and colors. Indigenous people, for their part, valued the materiality of glass—its luster, hardness, and durability, among other attributes—and people in different times and places expressed distinct preferences for specific colors of glass beads. Some groups, like the Ohlone and other tribes in central California, appear to have desired white glass beads for their resemblance to shell beads, while for others, such as Iroquoian and Algonquian speaking nations in northeastern North America, glass bead colors appear to have mapped onto color symbolism within dynamic Indigenous worldviews (Hamell 1992; Klehm 2017:615; Panich 2014:743-744; Ostapkowicz 2018:8; Turgeon 2004:34; and see Agbe-Davies 2017). In some cases, however, the patterns of beadwork and the social practice of beading held more significance than the beads themselves, as among the Métis in Canada (Supernant 2021).

Given their importance in Indigenous regimes of value, glass beads also quickly expanded beyond the parameters of encounters with colonists. Beads that had been strung or packaged according to color at European factories were often separated by Indigenous recipients who reconfigured them in a variety of ways. Many were traded along existing exchange networks, sometimes preceding the arrival of Europeans themselves, whereas others were strung alongside beads of differing materials (Blair 2015; Dalton-Carriger and Blair, this volume; Walder 2018). To date, most archaeological research has focused on glass beads from excavation contexts, particularly burials, but recent studies have also considered the broader array of objects into which Indigenous people incorporated foreign beads, ranging from those dating to the earliest colonial encounters all the way to the 20th century (Allen et al. 2018; Ostapkowicz 2018). Whether from archaeological or ethnographic contexts, elemental analyses of beads—like those presented in the following chapters—can help reconstruct the various itineraries along which beads traveled and the complex ways they were recombined by Indigenous actors. Ultimately, these patterns underscore the notion that Indigenous people assigned their own value to glass beads and in so doing recontextualized these objects with complex and dynamic meanings.
Glass beads — worn on strings around the neck, waist and arms; sewn onto clothing and bags; worn as headdresses; made as offerings to the spirits or the deceased — play an active role in displaying and enacting various group and individual social identities. The social meaning of beads can vary widely: beads can be protective, warding off evil spirits (Donley-Reid 1990; Campbell Cole 2012); they may serve as a public acknowledgement of friendship bonds, a tangible manifestation of alliances and social networks (Wiessner 1982); they may serve as an indicator of individual prestige, with their status conferred from the difficulty undertaken to obtain these materials and the skill involved in their production, or because of restricted access (Trubitt 2003); they may be heirlooms that represent family lineage and one’s heritage, never to be sold (e.g., Francis 1992); among other cultural uses; they may serve as gendered objects, both in terms of the beadmaking process and with who wears them (Sciama and Eicher 1998). The visibility of the beads, as well as their colors, patterns, and bodily placement, can be important components of creating culturally-recognized (and acceptable) aesthetics.

Ethnography and ethnoarchaeology demonstrate the ways that beads convey complex social and ideological meanings of being in the world. For example, beaded personal ornaments have long been associated with indexing ethnic identity among the Okiek hunter-gatherer and Maasai pastoralist communities, both located in modern Kenya (Klumpp and Kranz 1993). Among the Maasai, beadwork is seen as a woman’s personal wealth, akin to the number of one’s cattle for men (Klumpp 1987). As much as they appear similar in form and function, the perceived value of beads, and the “correct” patterns differ significantly between the two (Klumpp and Kranz 1993). Beyond ethnic affiliation, beads also are social cues for belonging within them. Quantity, color, and combinations of particular beads relate to various aspects of one’s individuality: ethnicity, family lineage, gender, age-set, progress through a lifecycle (e.g., birth, initiation, marriage, motherhood, death).

The act of producing glass beads and beadwork is also rooted in identity making. For the Okiek and Maasai, beadwork is completed for women, by women (Klumpp and Kranz 1993). In Purdalpur, Uttar Pradesh, India, the various tasks of beadmaking means community building through the various peoples (of different ages, sexes, and families) involved: from those who operate the furnace and those who make various manufacturing tools, to those who dye the beads and those who clean and string them together (Kanungo 2000, 2004). Technology transfer is likewise a social process, as the knowledge of glassmaking passes down from person to person (McCray 1999a). However, bead production and its various social identities may be tied to inequalities as well. In Purdalpur, for example,
beadmaking has been deeply structured around caste (e.g., Francis 1994; Kanungo 2004).

The ownership and use of glass beads are subject to social conventions. For instance, cultural norms regarding heirloom beads vary significantly among cultural groups: e.g., who can wear them, and when; who inherits them; whether collections are curated or split during inheritance; whether heirloom collections are considered “open” and can have beads added to the family line (Francis 1992:15-17). Among the Bontoc peoples of the Philippines, beads are part of the akon, moveable heirloom wealth, inherited at the time of marriage; and others not inherited at the time of marriage follow strict social rules of ownership (Francis 1992:7). The Ifugao peoples share their heirloom beads, if only temporarily: loaned to the shaman when a family member becomes ill, and used to bedeck corpses (that are removed again before burial) (Francis 1992:6). Cultural expression and rules of convention dictate use in the past, just as the present: early Sanskrit and Buddhist literature refers to women and horses wearing glass, while other rules forbid the use of glass for shoe ornamentation (Kanungo 2004:126-127).

Valuation is embedded within situational contexts of meaning: where beads are found is as, if not more, important as where they originated (Moffett and Chirikure 2016; Klehm 2017:629). For instance, Indo-Pacific glass beads dating to 11th century CE, show signs of significant alteration after they reach southern Africa communities: they are crushed, reheated, and molded into larger, multicolored beads known as “garden rollers” to conform to local tastes (Wood 2011; Klehm and Ernenwein 2016:56). Sarathi et al. (this volume) suggest that glass beads, as an exotic foreign object, may have been important prestige items at Unguja Ukuu in Zanzibar, Tanzania. Among the Tanis of northeast India and northwest Burma, beads have their own oral histories, with origin stories from a mythical ancestor Abo Tani in Tibet (Campbell Cole 2012). Tani heirloom beads were rarely sold, except in times of great need, seen as symbols of wealth based on the size, color, and luster and having protective powers. Their worth further increased when passed down within the same family from generation to generation. Similar to the Ifugao people, beads may also be placed with the dead as a sign of respect for one’s relative. Meanings are not static; beads can become “dead,” or lose their value (and provide bad luck) if cracked (Carter et al. 2018). In the Diaspora, the significance of the color of glass beads found in burials of enslaved Africans and what they mean for religion, tradition, and other social indices remains hotly debated (Davidson 2020; DeCorse 1999; LaRoche 1994; Lee 2011; Stine et al. 1996). Adornment and aesthetics, protective and health charms, symbols of worldviews and “tradition,” indices of socioeconomic status, and even as teethers for children have been posited and supported through varying evidence,
all at the intersection of enslavement, race, multiple ethnic identities, gender, and other factors (Lee 2011). Thus, context remains important: it is what these beads over other forms of material expression signify and do as part of social processes (Agbe-Davis 2017), which in turn change through time (Stahl 2010).

6. Conclusion

The chapters in this volume demonstrate the importance of glass beads as an archaeological and anthropological artifact. Many chapters also suggest directions for the evolution of glass bead research in the future. For example, Dussubieux’s work at Kish, Iraq highlights the new understandings one can gain by examining legacy collections. While much research has been conducted on bead origins (e.g., workshops) and their final place of deposition, we still understand little about the movement of beads, making Craig and Dussubieux’s study of glass beads from shipwrecks encouraging for better understanding bead exchange networks. Wood demonstrates just how complex these trade relationships may be, even within a confined time period. Klehm and Dussubieux further remind us that although beads may be an indicator of long-distance exchange, they also can inform about local and regional political dynamics. Several authors also note the importance of studying different types of beads together such as glass and stone beads (Dussubieux, this volume) or glass and shell beads (Walz and Dussubieux, this volume). Future work could move beyond identifying the presence of bead compositional groups and begin addressing why such groups exist, persist, and change over time. We also hope that the diverse papers in this volume and the discussions that took place between authors inspire continued communication across regions and time periods.

Glass beads, like beads more generally, are part of cultural, cognitive, and communicative systems of language, art, and symbolism (Bednarik 2001). As the case studies above and in this volume demonstrate, the study of glass compositions has especially allowed archaeologists to move beyond simplistic interpretations of beads as mere baubles and instead consider questions of contact, exchange, manufacture, use, and meaning in more depth. We acknowledge that studying the complex meanings of glass beads in various cultures, past and present, is subject to a number of conceptual challenges. Historical and modern contingencies have impacted the ways in which objects are used, and cultural categories may draw from the priorities and perceptions of ethnographers, ethnoarchaeologists, and archaeologists alike (Cunningham and MacEachern 2016). While interpretive approaches by researchers and conclusions vary, what remains is that glass beads actively mediate social lives across cultures through time.
References


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