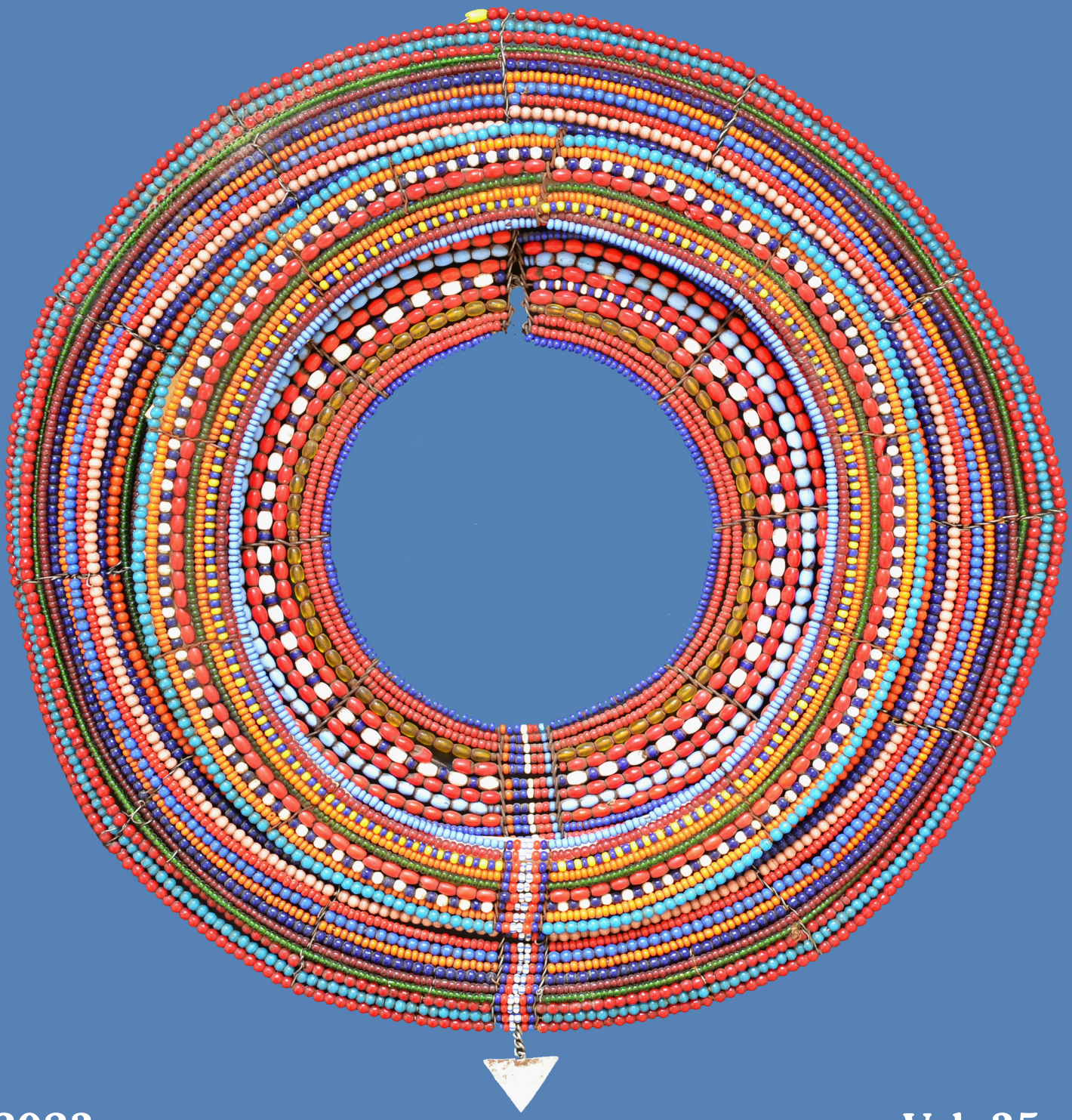
BEADS

Journal of the Society of Bead Researchers



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Cover and Inside Back Cover. Two women's collars (*oltirbe*), Tanzania or Kenya, 27 cm by 35.5 cm wide, 1950s-1960s, private collection (photo: M. Oehrl).

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Journal of the Society of Bead Researchers

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Karlis Karklins, *editor*

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INFORMATION FOR AUTHORS

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THE BEADED AND ASSOCIATED ADORNMENTS OF THE MAASAI

Michael Oehrl

The lavish beaded jewelry of the Maasai developed from comparatively modest beginnings. Since glass beads were originally a costly rarity in landlocked East Africa, elaborate beaded adornments only became possible in the second half of the 20th century. There are descriptions and illustrations of early objects in the publications of German and British colonial officials such as Moritz Merker and Claude Hollis, but much has been learned since their time. This paper describes the beaded jewelry and utilitarian objects of the Maasai, including their traditional Maa proper names, as well as the glass beads and other materials used in their construction.

INTRODUCTION

The Maasai inhabit an archetypal landscape with the highest mountain in Africa and, for many, represent the African people par excellence, whose unique way of life still attracts attention today. The colonial period, beginning in the mid-1880s, brought the arbitrary division of the settlement area of the Maasai into two parts, today's Kenya and Tanzania. A significant part of Maasai culture consists of beaded jewelry, the various forms of which in the late 19th and early 20th centuries are the subject of this article. It draws on early accounts of explorers and missionaries, as well as colonial officials, who were concerned with the material culture and language of the Maasai. Some of these publications appeared only in German and were never translated. Since the main flowering of Maasai bead jewelry did not occur until the 1950s, the development during this period will also be discussed.

HISTORY OF THE MAASAI

The Maasai belong to the Nilotic peoples and speak Maa, a Nilo-Saharan language (Laube 1986:9). The ancestors of modern Maa speakers probably migrated from the area of present-day southern Sudan to East Africa more than a millennium ago (Galaty 1993:61ff.; Laube 1986:11-12; Spear 1993:1). During these migrations, they mixed with some of the resident populations and displaced others. Genetic analyses show that, contrary to some common beliefs, they are a very heterogeneous people. They have absorbed parts of the population that settled in East Africa long before the Maasai, such as the Sandawe and especially Afro-Asian groups with Cushitic languages. There are also elements of the Bantu population that also migrated to East Africa (Tishkoff et al. 2009). Cushitic cultural heritage is represented by Maasai customs such as the division into age groups and the performance of circumcision (Laube 1986:10-11).

In the early 19th century, conflicts broke out between sedentary Maasai groups – sometimes etymologically imprecisely referred to by the Swahili term Kwafi – and the nomadic Maasai; other tribes were also involved (Jennings 2005:199-200; Voßen 1980:94). Changes in domination were frequent, and individual Maasai groups were strongly decimated or also assimilated. The exact course of these so-called Iloikop wars and the ensuing migrations has not been fully elucidated to this day (Bückendorf 1995:48ff.; Höhnel 1892:480; Laube 1986:16; Spear 1993:22-23; Voßen 1980:93ff.).

Their sense of being a chosen people, as well as their very efficient military system, made the Maasai feared, but also respected and even admired opponents (Merker 1904:114). From 1850, the Maasai dominated the steppe regions from Lake Baringo in the north to Ugogo in what is now central Tanzania, without really forming a single unit. This supremacy ended only when successive outbreaks of bovine pneumonia in the 1880s and rinderpest from 1891 decimated their extensive herds. Moreover, smallpox epidemics as well as famines claimed large numbers of human victims (Stuhlmann 1894:811ff.; Thomson 1885:204; Waller 1976:530ff.). After the beginning of the colonial period in what later became Kenya, the British administration

initially cooperated with the Maasai, but restricted them geographically from 1904 and finally expelled them forcibly from the areas north of Lake Naivasha in 1911. They settled in an area to the south that stretched from the Mara River in the west to Tsavo in the east. Members of the Kisonko and Purko-Maasai, two important groups separated at that time from their branches in Kenya, lived in what is today Tanzania. Their very extensive settlement area was significantly reduced by the German colonial administration until 1918 (Figure 1).

Figure 1. The location of the tribal groups in Kenya and Tanzania mentioned in the text (image: M. Oehrl).

FIRST CONTACTS AND DESCRIPTIONS

The German missionaries of the British "Church Missionary Society" – Johann Krapf, Jakob Erhardt, and Johannes Rebmann – had already made contact with the Maasai in the middle of the 19th century on their journeys to the East African interior in the environs of Kilimanjaro. This is also true for officer Carl von der Decken, in 1861, as well as the botanist Johannes Hildebrandt in 1876 (Decken 1871, 2:31ff.). What all these ventures have in common is that no one succeeded in penetrating directly into the populated Maasai highlands. Thus, Krapf obtained his most valuable information through Lemasegnot, a Maasai who had been abducted as a youth and taken to the coast (Krapf 1858:267-273).

Only the German physician Dr. Gustav Fischer, who was supported by the Hamburg Geographical Society, was able to enter Maasai country (December 1882 to August 1883), and then only by making high tribute payments known as *hongo*. These included cloth, iron wire, and an astonishing quantity of glass beads; Fischer (1884:57, 195) writes of a total of 10,000 60-cm-long strands. Fischer was, nevertheless, forced to turn back in June of 1883 north of Lake Naivasha in the face of large numbers of Maasai warriors, primarily because trade supplies were running low and his porters refused to accompany him any further (Fischer 1884:81). The legacy of Fischer's expedition includes the detailed records he left behind, as well as the various trinkets and utensils he collected, which are held mainly in Berlin and Hamburg (Fischer 1884:357ff., Plates 4-6, 66-68).[1] Shortly after Fischer, the British geologist Joseph Thomson, commissioned by the Royal Geographical Society, crossed the country all the way up to Lake Victoria (March 1883 to May 1884). Thomson wrote a very lively report which describes quite accurately the social structure and life of the Maasai in their different age groupings. He mentions the religious leaders, the *laibon*, who were powerful in magic and influential in rituals as well as war campaigns (Thomson 1885:273), while noting that most of the decisions of the tribe were made by councils of elders. Thomson (1885:283) received much information from Kombo-Ngishu, a former Maasai slave who had succeeded on the coast as a caravan trader.

Although Maasai women did not have many rights (Merker 1904:118), young girls lived in the separate kraal of the young warriors for several years before their circumcision and marriage, practicing what Henry Johnston (1886:416) called "free love" without any obligation to work. Pregnancies were, however, to be avoided and were punished. The explorer Ludwig Höhnel considered the term "free love" to be exaggerated; as a rule, couples would form, which, he observed, "intimately embraced like lovers." Beaded gifts to girls played a major role in courtship (Höhnel 1892:267, 320), and a Maasai youth's beaded jewelry was made by his favorite girl. Generally, beadwork was created only by women and the skill was passed from mother to daughter. Information on this is sparse in the early literature. What is striking is the amount of adornment that was also worn by the men, especially the warriors. In polygynous Maasai society, the marriage of initiated young women to older men who had outgrown the warrior group was more a matter of the bride price paid in cattle and was rarely associated with emotional expectations (Johnston 1886:416; Merker 1904:45-46). Young warriors from the age of 20

to about 35 essentially consumed milk and meat, under special ritual conditions, while the other age groups of men, as well as the women and children, also ate vegetal food. This was received by the women in trade from neighboring, sometimes even hostile, groups in exchange for animal products. For this to be possible, the arrangement had to be made that women were not subjected to male warfare. For example, while Maasai and Chagga or Kikuyu men fought each other "to the knife" (Thomson 1885:166, 308), women were not bothered (Baumann 1894:242; Fischer 1884:75; Höhnel 1892:315; Johnston 1886:404; Spear 1997:41).

In contrast, relations with the *El-konono*, the blacksmiths who made the bulk of the Maasai's shields and spears (Thomson 1885:425), were characterized by social disparity and dependence. There are different opinions about the exact status of this group, as well as about what distinguished the *El-konono* from the Dorobo people who lived, so to speak, in the shadow of the Maasai, mainly by hunting.[2] According to Moritz Merker (1904:110), the blacksmiths were a separate, despised caste which was only allowed to maintain social contacts among themselves, but were part of the respective Maasai tribe (Höhnel 1892:436). British colonial administrator Claude Hollis (1905:330) adds that the blacksmiths were members of the clans, especially those of the Kipuyoni, but spoke among themselves a dialect of Maa that was difficult to understand and had little contact with the outside.

MAASAI CLOTHING AND JEWELRY

When thinking of the Maasai, people commonly envision picturesque women adorned with numerous, wide necklaces composed of beads in a variety of colors. Movies like *Out of Africa*, based on Karen Blixen's novel which is set around the time of World War I, portray Maasai women with such collars in individual scenes. It is often forgotten that this splendor is a development of the 1940s and 1950s and that at the beginning of the century, beads were scarce. Truly early beadwork of the Maasai, from the time before World War I, is a rarity and mainly ended up in Germany and Great Britain, the two former colonial powers.

The following description of traditional Maasai clothing and jewelry is mainly taken from the detailed monograph of the German colonial officer Moritz Merker. He published it in 1904 after being stationed in Moshi from 1895 to 1902. Information provided by other authors such as Thomson, Fischer, and Hollis is similar, but much less detailed. Merker first puts forward an idiosyncratic theory of the origin of the Maasai from the Arabian Peninsula, which was already controversial and widely rejected in his time. In his view, this migration to the south lasted several millennia.

The ethnographic section of the book is very comprehensive and thorough even in modern terms, containing numerous illustrations and providing Maasai proper names for the various objects. Table 1 compares the terms used by Merker to those provided by colonial administrator Claude Hollis and anthropologist Donna Klumpp, where data are available. Although Moshi is located in the area of the Chagga tribe on the southern slope of Kilimanjaro, Merker took "extensive trips for work especially to the Maasai landscapes" (Merker 1910:x). Merker does not explicitly mention where among the Maasai his observations were made. His anthropological measurements and descriptions of Maasai individuals cite their origin in the region primarily south of Mount Meru and Kilimanjaro, with some also located near the border in present-day Kenya (Merker 1904:350ff.). The photographs in his book are all from northern Tanzania, while his map only provides a rather summary depiction of the area. Ninety-five objects collected by Merker are in the Linden Museum in Stuttgart.

CLOTHING AND ADORNMENT CA. 1900

Here I focus on Maasai objects that were frequently decorated with glass beads. Merker's monograph discusses many, but not all traditional items. The Austrian explorer Oscar Baumann (1894:157) mentions the great uniformity of the Maasai before the turn of the 20th century, something that is confirmed by other early authors. Later literature, especially Donna Klumpp's (1987) dissertation on her field research among the Purko-Maasai beginning in 1970, reveals the enormous proliferation and variation of body jewelry that occurred over the course of the 20th century. In the process, except for particularly traditional objects, changes in object names also took place. Klumpp (1987:83) explicitly distinguishes between objects that serve "magico-religious-medicinal purposes" and pure "fashion ornaments." Klumpp depicts the abundance of jewelry after the mid-20th century in numerous illustrations. Another detailed publication is Johannes Kalter's (1978) book on Maasai material culture from the 19th century to the 1970s. He also deals quite extensively with the sometimes contradictory data of various earlier authors.

Around 1900, men and women wore leather clothing exclusively, which was depilated except in the case of the warrior cape. While warriors wore a relatively small cloak of calfskin (*e megiti*) and often a piece of leather to sit upon, older men used a larger cloak. According to Merker (1904:132f.) and Hollis (1905: Plate II, xvi), these were occasionally decorated at the edges with one or two rows of white or red beads.

Table 1. Comparison of Maasai Names for Jewelry/Beadwork Noted by Different Authors (Singular).

Object	Merker	Hollis	Klumpp
Cape ♂	*e megiti*	*o en-gila*	*enkila*
Skirt ♀	*ol ogessana*	*ol-okesena*	*olekesena*
Face frame ♂	*os sidai*	*oe-sidai*	*sidai*
Brass spirals ♀♂	*surudia* (pl.)	*surutya* (pl.)	*isurutia* (pl.)
Ear jewelry top ♀♂	*ol oimeri*		*olaimeri*
Bead string ♀	*er naitule*		
Metal jewelry ♂♀	*es segengei*	*seengani*	
Neck spiral, large ♀	*es segengei e murt*	*seghenge oo-murto*	*esekenke emurt*
Necklace ♀	*e mairenai*		
Bracelet top ♂	*ol gilescho*		
Upper arm clasp ♂	*e rab*	*e-rap*	*errap*
Bracelet ♂	*n gamnini*		
Metal rattle ♂	*en dualla*		*oltuala enkeju*
Leather belt, narrow ♂	*eng ene om bolos*		
Leather belt, narrow ♀	*en dore*		*entore*
Leather belt, wide ♀	*en ailiena*		*enkimeita*
Snuff container ♂♀	*en dulet*		*enkidong olkumpau*

Women's clothing was more substantial and consisted of two parts, each made of sewn goat skins. The upper part (*ol egischobo*) bore a few beads, while the women's skirt-like leather backskirt (*ol ogessana*) usually contained more: "A row of colorful, small beads leading around the lower edge is most common; often the inset patches are also sewn around with beads" (Merker 1904:134). In later years this became somewhat more heavily decorated (Musée du quai Branly 71.1938.45.1.1-3), but very lavish patterns are an innovation of the second half of the 20th century.

The most striking ornament of the warrior was the leather face frame (*os sidai*) encircled with ostrich feathers. This was occasionally decorated with beads and cowries (Berlin III E 421, collected in 1876 by the botanist Johannes Hildebrandt) (Moko 2021:109, Figure 6). This is an object for war with ceremonial functions and a protective effect. A variation for warriors who had killed a lion was the replacement of the ostrich feathers with the fur of the lion's mane (Merker 1904:135).

Men sometimes covered the head with a cap in "the shape of a baby's hood" (Merker 1904:136) made from the second stomach of a cow or from a different leather embroidered on the edge with beads (Musée de quai Branly, 71.1905.7.339). Caps were sewn by the warriors themselves.

Many pieces of Maasai jewelry were made of various metals, such as iron, copper, brass, and tin, materials whose use has survived well into the 20th century. Married women adorned their necks with a very typical, substantial spiral of thick iron wire (*es segengei e murt*), the first and last turns of which were sometimes wrapped with thin copper or brass wire (Merker 1904:139). Young girls and women also "wrapped" their arms and legs in cuffs of iron wire (*es segengei*), which sometimes left only the joints exposed and significantly limited their mobility (Figure 2).

Other important pieces of jewelry for married women with children were two heavy spirals of brass wire on leather straps (plural *surudia*; singular, *e surudiai*) in their stretched earlobes. Usually, because of their weight, they were additionally supported with a sometimes-beaded carrying strap worn over the head. They were occasionally decorated with a beaded leather strap across the spiral and iron chains (Merker 1904:137-138) (Figure 3). Women's fertility was

Figure 2. Maasai women with jewelry made of iron wire, 1902-1905 (photo: Max Weiß).

connected with *surudia*, and many ritual practices in Maasai life associated with childbirth, the naming of children, and initiation could not take place without them. From the leather carriers for the brass spirals in the lower ear hole, the well-known earflaps developed over the years through various intermediate stages (Figure 4). Older men with circumcised children and male initiates also wore *surudia* on ritual occasions. The various authors differ in their statements on this topic.

Figure 3. Maasai *surudia*, Kenya, 16.5 cm long, collected by Sidney Hinde (courtesy of The Trustees of the British Museum, London, acc. no. Af1900, 0620.22a-b).

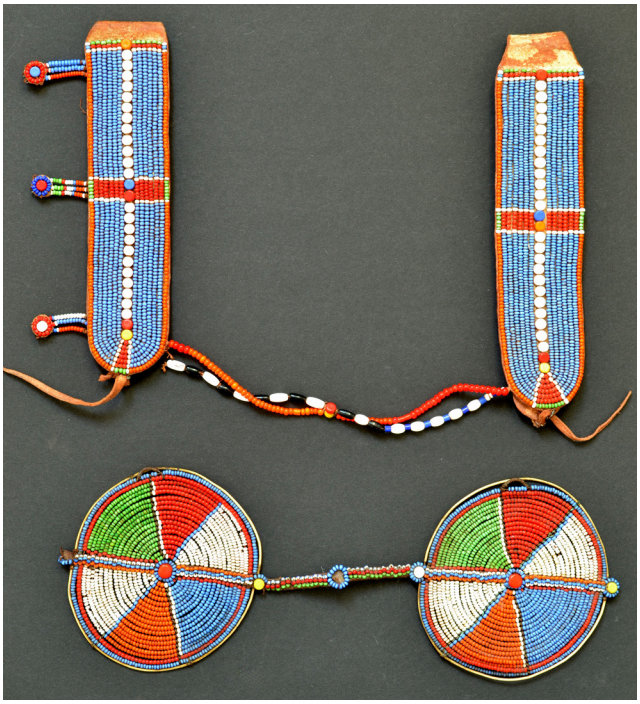

Figure 4. Maasai earflaps and decoration, Kenya or Tanzania, 17 cm by 26 cm, 1960s, private collection (photo: M. Oehrl).

In the upper ear hole, women wore jewelry made of tin sheets and thin handmade iron chains, indicating their status as initiated. This ear jewelry (plural: *el oimer*; singular: *ol oimeri*), which according to Merker (1904:137) was also used by men, as well as the larger metal jewelry of the women, were made by the wives of the blacksmiths (Merker 1904:114). Wire and especially thin chains made by the Chagga were also caravan trade goods (Fischer 1884:48-49). This jewelry, which was placed in the widened holes in the upper and separately in the lower part of the ear, saw many changes in design over a period of more than a 100 years. These changes were recorded in sketches of the Purko-Maasai by Donna Klumpp (1987:252-258) (Figure 5).

At dances, young girls adorned the head with combinations of single or double strings of beads and iron chains (*er naitule*) (Merker 1904:138). During initiation ceremonies, they wore headbands adorned with cowries and chains, already mentioned by Fischer (1884:64). An illustration of this can be found in Kalter (1978:232, Figure 2). Merker (1904:65) describes only grass rings, which were decorated with an ostrich feather.

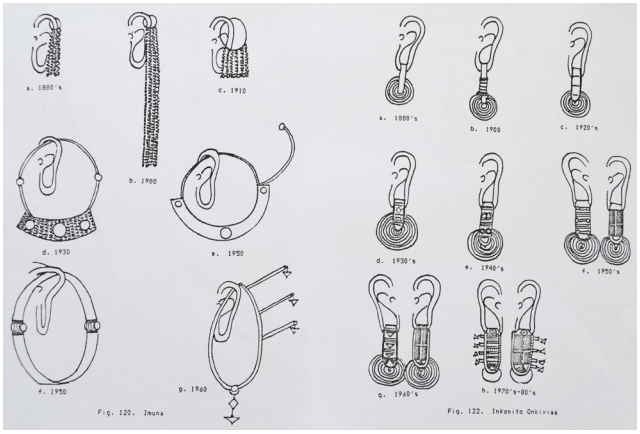

Figure 5. Ear jewelry (Klumpp 1987:252, 254).

Warriors used simple metal necklaces with attached long chains (*es segengei*). For women, individual strings of beads made of small, pea-sized white and blue beads or ring beads, mostly threaded on wire, were worn as additional neck jewelry (Hollis 1904:282), which usually indicated greater wealth (Merker 1904:139). Ring beads (*en gonongoi*) specifically blue ones, were threaded on a leather strip and worn primarily by fathers and older women. They were used in ceremonies such as the circumcision of sons and were associated with symbolic meanings (Moko 2021:112-114). At peace ceremonies, the sheep that was presented wore a necklace of ring beads (Merker 1904:100).

Beaded bands (*'e mairenai*) are described by Merker (1904:139) thus: "The beads are either strung onto wire or onto threads twisted from cattle sinew, or are also sewn onto narrower or wider flat leather rings. In the latter case, the beads are arranged by color in rectilinear, usually square, patterns." Still quite rare in the 19th century, these were the forerunners of the more substantial collars of the mid-20th century (Fischer 1884: Plate 5, no. 23; Widenmann 1899:53). (Figure 6). The centerpiece of these collars was sometimes adorned with *Conus* discs and metal chains. The discs were a status symbol throughout East Africa and were imitated in ceramics early on in Europe (Figure 7).

Warriors adorned themselves on the left upper arm with a leather bracelet with beads (*ol gilescho*) or with a horn clasp (*e rab*) (Merker 1904:140), and on the right forearm with a cuff (*n gamnini*) made of iron beads (Hollis 1905:295; Merker 1904:140) or, later on, also of small, mostly blue glass beads (Merker 1904:141; Thomson 1885:248) (Figure 8). On the legs, warriors wore metal rattles (*en dualla*) whose leather straps were often decorated with glass beads at dances, but also in everyday life and during warlike undertakings (Merker 1904:142) (Figure 9).

A dance ornament of the warriors was a very narrow leather belt (*eng ene om bolos*) embroidered with small beads. It was also used by very young girls, for whom the belt was supplemented in front with metal chains as a "fig leaf" (*en dore*).

Figure 6. Woman's necklace (*e mairenai*), Kenya, 26 cm long, collected by Henry Johnston (courtesy of The Trustees of the British Museum, London, acc. no. Af1901,1113.21).

Older girls and young women used an elaborate belt, about 3 cm wide, with a striking triangular pattern (*en ailiena*) to hold their long leather skirt (Figure 10). According to Hollis (1905:301, Plate XX), this belt was restricted to young, unmarried and uninitiated girls, but Merker (1904:142) also observed them on older women. Moko (2021) describes how the belts were passed on to other girls after initiation. They could also be used by the newly initiated boys during their seclusion: "The new initiates wear objects from other groups of the society, such as ear pendants and black clothes from women, a replica of a bow and wooden arrows, and a blue-black beads necklace from the elders" (Moko 2021:122). The belts were made by the girls' mothers. With the same basic pattern, there are rather rustic specimens made of larger Venetian glass beads in classic colors such as red, blue, and white. There are, however, also old pieces with very small beads in a variety of colors, often transparent, whose expressive colors seem to fit less into a traditional context. By the time of Klumpp's fieldwork in the 1970s, the traditional triangular pattern of the belts had mostly been replaced by stripes and blocks of color, and the belts had become wider, which was also accompanied by a change of name (*enkimeita*).

Figure 7. Woman's necklace (*e mairenei*) with *Conus* disc (*ol galash*), Tanzania, 45 cm long, collected by Moritz Merker before 1902 (photo: Dominik Drasdow, courtesy of the Linden-Museum Stuttgart, acc. no. 021358).

The ritual consumption of tobacco was reserved for older men and women, meaning that snuff and chewing-tobacco containers (*en dulet*) and the like were not part of the warriors' equipment (Merker 1904:35, Figure 6; Moko

Figure 8. Upper arm clasp (*e rab*), Kenya, 18.5 cm long, collected by H.R. Tate (courtesy of The Trustees of the British Museum, London, acc. no. Af1901,1114.30).

Figure 9. Leg rattle (*en dualla*), Kenya, 32 cm long, collected by Sidney Hinde (courtesy of The Trustees of the British Museum, London, acc. no. Af1900,0620.33).

2021:113, Figure 8b). Bamboo, cattle or rhinoceros horn, and rarely ivory or wood in various forms were the main materials. The containers were worn on copper or iron chains (Figure 11). Krapf (1857:463) identifies containers made from the pitted fruit of the mkoma tree. From the middle of the 20th century, the forms changed and with them the names, such as *enkidong* or *olkumpau*, depending on use and region (Klumpp 1987:247).

Calabashes of both bulbous and narrow shapes were decorated with leather strips adorned with cowries, more rarely with a few beads (Merker 1904:37, Figure 9). Kalter (1987:49) lists four different old forms, which he classifies and names according to their function. From the beginning of the 20th century, a special type of calabash, presumably for special occasions, is completely covered with beads. In collections, these are usually attributed to the Maasai or to the Kamba who lived to the east (British Museum, Maasai Af1944,05.3, Kamba Af1914,0516.7.a, Af1936,0104.5, Af1947,16.345). The Kamba, however, had their own style of decorating variously shaped calabashes, which additionally involved the use of copper chains. Kalter (1978:50) attributes these calabashes to the Chagga, mainly because of the primary use of white, blue, red, and pink beads. This could be possible, but the beads used in old Chagga pieces are always significantly smaller, so that the attribution remains uncertain (Figure 12).

Figure 10. Detail of two belts (*en ailiena*), Kenya or Tanzania, 74-78 cm long, early 20th century, private collection (photo: M. Oehrl).

Finally, Merker (1904:40) describes large leather bags with sparsely beaded appliqués. Other authors mention large, triangular leather breastplates (pectorals), which were also decorated with beads and metal chains (Fischer 1884: Plate 5, no. 3; Klumpp 1987:241) (BM Af1904-102 and 103). Hollis (1905:301, Plate XX) shows a poncho-like and similarly decorated leather ornament, which was used during war campaigns (*ndorosi*) (Figure 13). Joy Adamson (1975:324, Plate XXX) depicts a similar cloak on a "Seguju witch doctor" and mentions that Shirazi medicine men also wore such items. Both are coastal peoples living in Kenya.

Women never showed themselves in the presence of their husbands without their jewelry. Only during circumcision, sometimes during pregnancies, and in periods of mourning, were all ornaments removed (Kalter 1978:149; Merker 1904:50, 65, 194; Weiß 1910:384), as well as after death. The personal ornaments of deceased men were distributed among their children after two months – according to Kalter

Figure 11. Snuff container (*en dulet*), Kenya or Tanzania, 18.5 cm long, early 20th century, private collection (photo: M. Oehrl).

Figure 12. Beaded gourd, Kenya, 31 cm long, early 20th century, private collection (photo: M. Oehrl).

(1978:27), only to sons. Women's beaded jewelry became the property of their daughters, but metal elements were discarded (Leakey 1930:205-206).

THE CONCEPT OF "INALIENABILITY"

The publication by ethnologist Laibor Kalanga Moko (2021), who has Maasai ancestors in Tanzania, uses the holdings of the Ethnological Museum in Berlin as a reference. He argues that virtually all objects of material culture, including clothing and jewelry in particular, are inextricably linked spiritually to the person and can

Figure 13. Ceremonial cape, Kenya, 96.5 cm long, purchased from Gerrard and Sons (courtesy of The Trustees of the British Museum, London, acc. no. Af1905,1022.2).

therefore only be passed on within the group. Therefore, all objects, no matter how seemingly insignificant, are not legally acquired because they are "inalienable."

> My interlocutors perceive that inalienable objects were inappropriately acquired and taken to the museum through various routes, including acquisition in war contexts, such as community involvement in inter-ethnic wars during cattle raids, World War II and unknown wars with Europeans, [as well as] deceitful acquisition by postcolonial European investors who had befriended the local people, and illicit selling under the influence of neo-liberalization (Moko 2021:132).

Such evaluation of oral history is controversial, since memories are always subject to subsequent changes and superimpositions. This method is even less useful if the memories of the Maasai interlocutors do not even reach back to the events of World War II, as Moko (2021:132) himself acknowledges. Here, it may be that his interlocutors have an idealized idea of the Maasai's past in the 19th century. Especially during Fischer's and Thomson's early (pre-colonial) expeditions, it would have been highly dangerous to acquire objects illegally. These ventures, despite being accompanied by many armed men, were constantly threatened by theft and hostility from the Maasai (Fischer 1884:54-55; Thomson 1885:171, 285-286, 296, 304). Fischer (1884:64) mentions a single "ethnological object that it was impossible for me to obtain"– a forehead ornament of iron chains and cowries worn by newly circumcised girls. He states that the Wakuafi (Kwafi) of Klein-Arusha were afraid of certain barter items such as glass earrings and small mirrors:

> The fear of sorcery was just as great here as among the Maasai, and the greatest caution was necessary when purchasing ethnological items, especially certain kinds such as handicraft tools and domestic utensils .... Mirrors were also impossible to place, and the Maasai were especially afraid of them (Fischer 1884:93-94) (translation by author).[3]

During his expedition to Lake Turkana in 1887-1888, Ludwig Höhnel (1892:320) describes how a Maasai warrior wanted to exchange his "beautiful, long sword" for 40 strands of glass beads. When asked why he wanted to sell his sword so cheaply, he replied, "Oh well, his *doje* is angry because he does not bring her any beads. However, he does not know how to get them, so he brings his *sime*. He has nothing else."

THE INFLUENCE ON THE NEIGHBORS

Jewelry that was very similar to that of the Maasai was also worn by neighboring peoples of very different ethnic origins, especially the Dorobo (Okiek), Meru, and Arusha (Ilarus), as well as the Nandi, Chagga, and Kikuyu. Such similarities have been documented and illustrated in several publications (Arkell-Hartwick 1903:316 [Kikuyu]; Widenmann 1899:50ff. [Chagga]). Several collections contain such objects (Grassi-Museum, Leipzig, Chagga MAf1388, 1389, Kamba MAf6149; Ethnologisches Museum, Berlin, Chagga III E 17990). Often the similarity is so great that one might suspect intertribal trade. Kalter (1978:1) considers such trade to have been active, but

specific evidence is largely lacking. Some pieces use slightly different colors and materials. Over time, particular color schemes and stylistic details developed, facilitating more accurate identification. The more extensive use of pink glass beads became typical for the Kikuyu, as did turquoise glass beads for the Nandi and Kipsigi (Klumpp and Kratz 1993:205). At the same time, neighboring peoples possessed their own indigenous jewelry traditions that differed significantly in appearance. In any case, the Maasai exerted great influence on the material culture of neighboring peoples wherever they settled or went on war and cattle raids. Even the Gogo in central Tanzania coiffed and adorned themselves similarly to the Maasai, and carried weapons that corresponded to those of the Maasai and were supposed to spiritually transfer the power of the Maasai to their own people. Military and cultural dominance are closely linked here (Lawren 1968:578, 580).

GLASS BEADS IN OLD PIECES

It is difficult to determine exactly where the glass beads in African jewelry came from before the height of colonialism in the late 19th century. They were available in smaller quantities in the coastal areas of East Africa at the latest in Islamic times, through Arab trade contacts, and were passed on through intra-African intermediary trade. In areas influenced by the Portuguese from 1500 onward, such as present-day Mozambique, mainly Yao traders were active. Further north, Swahili and Arab traders dominated, mostly financed by Indian merchants. The coast named after the Swahili and the island of Zanzibar had been under the control of Arab rulers from Oman since about 1700 (Kimambo 1989:238ff.).

The ethnologist Ulf Vierke (2004:264-265) writes that mainly Venetian beads were traded as far as Mogadishu (Somalia), via Ethiopia. The region south to Kilwa was exclusively the realm of Indian trader, while in Mozambique European beads predominated once again. On the Swahili Coast, the share of European vs Indian beads increased towards the end of the 18th century. From 1860 onwards, the importation of beads from the Fichtelgebirge (Franconia) increased.

> When New England traders gained a foothold in Zanzibar at the beginning of the 19th century, they also brought Bohemian beads to East Africa. In addition, large quantities of glass beads were imported via Hamburg. They were of Bohemian but also Frankish provenance. Glass beads were one of the three most important European trade goods in the caravan trade of the 19th century (Vierke 2004:265) (translation by author).[4]

According to Vierke, 80% of all the beads exported to the Swahili Coast in 1880 passed through Hamburg, while only 20% came from British India (Vierke 2004:315).

It is certain that the Maasai were also end users of this trade in metal wire and glass beads in exchange primarily for ivory from at least the mid-19th century (Krapf 1858:271). The necessary ivory was supplied to the Maasai by the dependent Dorobo hunters (Fischer 1884:47; Johnston 1886:424; Krapf 1857:462). Contact with the Swahili caravans was made under special precautions through Maasai women or individual men. Gifts to elders then facilitated negotiations (Krapf 1857:461-462). In any case, the development of Maasai body jewelry clearly preceded European expeditions and conquests, although one must rely on conjecture and extrapolation in the absence of Arabic or Swahili descriptions. South African social anthropologist Vanessa Wijngaarden (2018:8) posits that Maasai beadwork emerged on a more extensive scale only in response to colonial prohibitions on warriors displaying their weapons and battle shields in public. At best, this seems to be a partial view, when one considers the older literature and the dynamics of development in other African countries, which was essentially a matter of economic opportunity.

Gustav Fischer was the first author to describe Maasai preferences in more detail in 1884, while Krapf (1857:463) had remained very general, mentioning only blue and white beads. The most desired beads were the small "enamel" white (as opposed to "milk" white) and dark blue ones (*madschi bahari*); in contrast, the "most precious beads, which are said to have been very popular in the past, were often spurned," namely the red ones (Swahili: *same same* = red white heart). Especially prized among the Maasai were larger white oval beads (*sambái*), colorful ones in the shape of a small acorn, blue ring-shaped ones (*mtunarók*), and larger pink or light blue ones. The simpler varieties were threaded on 30-cm-long double strings of raffia for bartering.

> Generally, in the districts nearer the coast, stronger varieties are popular, and in the more distant ones the finer (Fischer 1884:48).
>
> In the bead jewelry, white, red and dark blue are the most common combination of colors; green, light blue and pink-colored beads are found more rarely. Their sense of color does not lag behind the Swahili, as is also evident from the fact that they have very numerous names for the various colorings of their cattle. The dark blue beads were always designated by the women as erók (black) (Fischer 1884:68) (translation by author).[5]

Merker (1904:139) makes similar statements for the period after 1895, although some of the Maasai designations

he records differ. He mentions small colored glass beads (*e msitáni*), pea-sized white and blue glass beads (*ol duréschi*), elongated bean-shaped white beads (*es sambain*), date-seed shaped, multicolored patterned beads (*em boro*), and ring-shaped blue and green beads (*en gonongoi*).

Thomson mentions glass beads in many places, including the large quantities of beads taken on his expedition (1885:227), tributes to Maasai warriors (Thomson1885:169), and small bead gifts to Maasai girls (Thomson 1885:282, 338). His descriptions of Maasai costumes and their beads, however, are much more sparing than those of other authors (Thomson 1885:428ff.).

Among the merchandise Ludwig Höhnel (1892:13-14) took on his expedition through Maasai country to Lake Turkana with Count Teleki are the following items:

> Maasai beads, which are round glass beads from 2 to 2 ½ millimeters in diameter in red (*same same*), blue (*madschi bahari*) or white (*uschanga meupe*) color, in total 2800 kilograms; furthermore, so-called *ukuta*, which are pea-sized, blue glazed Parisian beads; bad, white porcelain beads called *sambaj*; *murtinarok*, which are green, blue or light brown colored glass rings of 1 centimeter diameter; very fine, tiny glass beads for the Chagga states (Kilimanjaro) in crimson and turquoise blue color; finally also a whole stock of different, large beads, which go under the collective name '*Mboro*.' On a trial basis, we also took a larger batch of beautiful, up to pea-sized pearls in white, chamois and blue, which the Filonardi trading house began to introduce under the generic name "perles orientales" (translation by author).[6]

In general, documented 19th-century Maasai jewelry usually contains slightly larger seed beads (2-3 mm). The red white heart beads often present are almost certainly Venetian during this period, as are probably seed beads of other colors. Oval monochrome "barley-corn" beads (size 8-10 mm) produced by the winding method since the 18th century were also used. In East Africa they can be found up to the 20th century. Their origin is not yet clear, although early versions probably came from Venice. The Maasai used mainly the white variety (*sambaj*) (Figure 7). In addition, there are Bohemian beads and beads from the Fichtelgebirge, such as ring beads.

At the end of the 19th century, the classic (opaque) colors of white, black, dark blue, medium blue, turquoise, and red were still traditional, but after 1904 a strong, opaque yellow and a transparent red came into use. Pink, which was not very popular in any case, disappeared completely after 1910. After 1918, colors such as light blue and lime green appeared, displacing turquoise and dark green. The red beads with white cores were hardly used anymore (Vierke 2004:453-454). After 1945, a rich orange and two strong opaque reds appeared (Klumpp 1987:40-41). Characteristically, the color code became: green, red, white, orange, and blue (Klumpp 1993:205). More frequently, individual color fields are also set off by lines in contrasting colors. In individual pieces, however, this division of colors can already be found at the beginning of the 20th century. These are generalizations, because the study of various Maasai works in museums shows that, for example, light blue and lime green already occurred around 1900 (Berlin III E 10864, collected by Domke in 1903). According to Klumpp (1987:64), most of the beads used in the mid-20th century came from what is now Czechia.

Statements made in the literature (Carey 1986:27) that oval, disc-shaped, or "snake" beads (a representation of snake vertebrae using the Prosser technique in Bohemia) were a more recent development are misleading. These shapes were all in use by 1900, although these beads can be distinguished from more modern versions, and their use increased over time.

OTHER MATERIALS USED

Until the mid-20th century, Maasai beadwork almost always used sinew. The women perforated the leather with an awl and pushed the hard, twisted sinew through the hole (Klumpp 1987:72; Merker 1904:136; Weiß 1910:341), using a single-thread backstitch to attach the beads. Donna Klumpp (1987:72-75,193-194) mentions other stitches, such as chain-, satin-, blanket-, and running-stitch, as well as techniques such as smocking, wrapping, and couching. Sinew was also standard among the Nandi and some of the Chagga work, while other Chagga pieces and most of the Kikuyu beadwork used brown hemp-like fiber typical among many peoples in Tanzania. According to Widenmann (1899:51), the Chagga sinew was obtained from the neck and back of cattle, an assertion that Donna Klumpp (1987:70) affirms for the Maasai.

Much of the Maasai beadwork was sewn onto leather and, in the case of simple chokers, also threaded onto wire; fiber wasn't used until more recent times. Wire was also the material of choice from the middle of the 20th century on, especially for the elaborate collars. According to Merker (1904:113), the thin wires were drawn out from stouter material by Maasai's blacksmiths using simple means, or obtained through trade. Initially, leather divider strips were used to separate the different color fields; plastic and rubber separators were also used later on. Vanessa Wijngaarden (2018:9) notes that in more recent years plastic has been preferred over leather for personal beadwork because

it is easier to work and more durable. For a time, the use of plastic parts was considered typical of pieces made for tourists (Kalter 1978:160).

For the production of men's clothing, non-dehaired calf skins went through a very simple "chamois tannery" where the skin was processed using fat. The depilated goat skins for women's clothing were rubbed with an extract from the bark of the tree *Terminalia brownii*, and the tanning extract was removed afterwards by boiling (Merker 1904:131-132). Donna Klumpp (1987:70) writes of "oil-tanned leather," which she subsequently refers to as "skin" without further differentiation.

THE DEVELOPMENT OF BEADED JEWELRY AFTER 1940

Extensive iron or brass spirals (without beads) were used by married women as neck ornaments well into the 1940s. Photographs by Casimir Zagourski from the late 1930s show that some women began to wear a variety of initially narrow beaded neck rings (Figure 14) at that time (Bassani and Loos 2001, I:151, II:159).

After having dropped to almost zero during World War II, bead imports exploded thereafter, and a heyday of beaded jewelry design began in the 1950s, lasting until the end of the 1960s (Vierke 2004:105, 136).

The evolution of single strands of beads to hoop-shaped necklaces continued until the comparatively wide hoops in disc form (strung on wire in concentric circles) were created (Figure 15 and cover). Joy Adamson (1975:221, Figures 149, 154, 226) documents this in her photographs and watercolors from the early 1950s. The collection of British military policeman P. McLaren in Nakuru, assembled in the early 1960s and now in the British Museum, shows typical examples. The Lerner and Queeny collections at the American Museum of Natural History, from the 1940s and 1950s, are similar. A more precise classification by form or region seems very difficult and is rarely possible for reasons of space. The sometimes lavish bead applications on utilitarian objects, such as the formerly simple belt for the Maasai sword (Figure 16) and the calabashes decorated only with cowries around 1900, are also a development of the second half of the 20th century.

With the ban on bead imports as luxury goods in socialist Tanzania at the beginning of the 1970s and a strong reduction in Kenya for some years in the 1980s, a stagnation in the design of beaded jewelry set in, ending only in the 1990s. Because of the exodus of many Indians from Tanzania, the bead trade there had to be restructured (Vierke 2004:122).

Figure 14. Masai woman, 1930s (photo: Casimir Zagourski).

THE PRODUCTION OF JEWELRY IN RECENT TIMES AND AS SOUVENIRS

After the massive interruptions in the Tanzanian bead trade, a renewed boom began after 1995. In the city of Arusha, the Maasai groups of Ilarus and Kisonko and the Cushitic Barabaig were the main buyers of glass beads, accounting for 75% of total sales, with the remainder used for souvenir production (Vierke 2004:71).

"Glass bead objects are not commodities in the traditional context; at most, they were given away or lent out," opines Vierke (2004:91). Nevertheless, the production of items intended for sale also began, especially in Kenya. Women of the Kikuyu from Nairobi and occasionally of the Maasai were intermediaries (Vierke 2004:94). Some of Kalter's (1978:204ff.) Maasai informants were suppliers to the souvenir stores in Nairobi. Vierke (2004:213) recounts the attempts of some women jewelry producers to make use

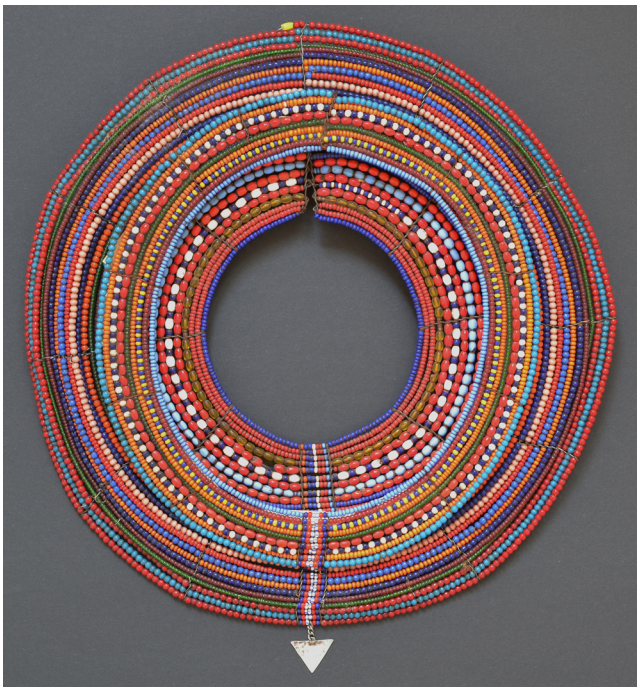

Figure 15. Two women's collars (*oltirbe*), Tanzania or Kenya, 27 cm and 35.5 cm wide, 1950s-1960s, private collection (photo: M. Oehrl).

of parts from old, poorly selling sword belts, refashioning them with the help of rubber gaskets from auto repair shops, into the more popular chokers. The efforts of a U.S. dealer in Native American jewelry to buy up leather skirts made by Maasai women in large quantities are described anecdotally. He succeeded in acquiring a hundred different specimens, some of which, however, had been "improved" by additional beaded decorations by the sellers.

Figure 16. Waist belt for a sword, Kenya, 35 cm (coiled), collected by Peter McLaren between 1961 and 1966 (courtesy of The Trustees of the British Museum, London, acc. no. Af1983, 06.12).

CONCLUSION

Individual Maasai make a living from selling souvenir at tourist centers in Kenya and Tanzania, even Zanzibar, where it is their main source of income. "Nowadays, an extensive manufacturing system is set up to produce tourist art. Even used machetes and leaking calabashes used to transport milk are sold to eagerly paying visitors" (Salazar 2009:62). This mostly low-quality production is distinguished by the Maasai from production for their own use, although the two occasionally influence each other. Even today, beaded jewelry is a necessity among traditional Maasai and is worn in an almost bewildering variety by many groups, including the Samburu, who live in northern Kenya and are related to the Maasai, forming what is essentially a living tradition. The division into traditional and "fashion ornaments," as described by Klumpp, can be presumed here. Younger generations compete with previous age groups to produce expressive and eye-catching patterns.

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ENDNOTES

1. The collection in Hamburg suffered considerable losses during World War II, so that only an insignificant residual stock remains. The Ethnological Museum in Berlin did not want the author to publish images of Maasai jewelry collected by Gustav Fischer because it is "culturally sensitive" material (Gina Knapp 2023: pers. comm.). Photographs of such objects of Tanzanian societies are presently approved by the museum for publication in books and essays or online only in cooperation with the communities of origin (Paola Ivanov 2023: pers. comm.).

2. Dorobo; Maa: *Il-torobo* = pejoratively, "those without cattle." Various, non-homogeneous groups; some call themselves Okiek and speak the language of the Nilotic Kalenjin neighbors; others, who belong to the early settlers of Kenya, speak Cushitic languages (Blackburn 1974:149-150). In part, they lived in Maasai territory by hunting and other means. Okiek women make beadwork very similar to that of the Maasai. Donna Klumpp and Corinne Kratz studied Maasai and Okiek beadwork in the 1980s. Okiek work is almost impossible for the layperson to separate from

that of the Maasai. The differences are often only in the sequence of colors and differently chosen contrasts. Because of the differences, Maasai call these works "false, ugly, clumsily made" or simply "non-Maasai" (Klumpp and Kratz 1993:214).

3. Die Furcht vor Zauberei war hier ebenso gross wie bei den Massai, und beim Einkauf ethnologischer Gegenstände, besonders gewisser Art wie z.B. Handwerksgeräthe und häuslicher Geräthe, war die grösste Vorsicht nothwendig… Spiegel waren ebenfalls nicht anzubringen, besonders fürchteten sich die Massai vor ihnen....

4. Als neuenglische Händler zu Beginn des 19. Jh. auf Sansibar Fuß fassen, bringen sie auch *Böhmische Perlen* nach Ostafrika. Daneben werden große Mengen Glasperlen über Hamburg importiert. Sie sind böhmischer aber auch fränkischer Provenienz. Glasperlen gehören zu den wichtigsten drei europäischen Handelsgütern im Karawanenhandel des 19. Jh.

5. Bei dem Perlschmuck ist weiss, roth und dunkelblau die häufigste Farbenzusammenstellung, seltener findet man grüne, hellblaue und fleischfarbene Perlen. Ihr Farbensinn steht nicht hinter dem der Suaheli zurück, wie auch daraus hervorgeht, dass sie für die verschiedenen Färbungen ihrer Rinder sehr zahlreiche Bezeichnungen haben. Die dunkelblauen Perlen wurden von den Weibern immer mit erók (schwarz) bezeichnet.

6. ...Masaiperlen, das sind runde Glasperlen von 2 bis 2 ½ Millimeter Durchmesser in rother (*samesame*), blauer (*madschi bahari*) oder weißer (*uschanga meupe*) Farbe, im Ganzen 2800 Kilogramm; ferner sogenannte *ukuta*, das sind erbsengroße, blau glasirte Pariserperlen, *sambaj* genannte, schlechte, weiße Porzellanperlen, *murtinarok*, d.s. grün, blau oder hellbraun gefärbte Glasringe von 1 Centimeter Durchmesser, ganz feine, winzige Glasperlen für die Dschagga-Staaten (Kilimandscharo) in karminrother und türkisblauer Farbe, endlich auch einen ganzen Vorrath verschiedener, großer Perlen, welche unter dem Collectivnamen "*mboro*" gehen. Versuchsweise nahmen wir außerdem noch eine größere Partie schöner, bis erbsengroßer Perlen in Weiß, Chamois und Blau mit, welche das Handlungshaus Filonardi unter dem Gattungsnamen "*perles orientales*" einzuführen begann.

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CATLINITE BEADS: *LES AUTRES DIAMAS DU PAIS*

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Archaeological evidence is combined with 17th-century documents to record the production of red stone beads by Anishinaabe communities in southern Ontario for exchange with neighboring Iroquoian populations as far away as the Seneca in upstate New York. A transition from local red siltstone to exotic catlinite appears to have been influenced by the mid-century Iroquois Wars, while the symbolism inherent in these items may have been related to the introduction of European diseases.

INTRODUCTION

The title of this article alludes to a report by François le Mercier in the *Jesuit Relations* of 1654 of a "large Porcelain collar, a hundred little tubes or pipes of red glass, which constitute the diamonds of the country" gifted to a peace delegation of the Five Nations Iroquois (Thwaites 1899:110-111), as cited by Ian Kenyon (1984:6), and proposes that red stone beads of the period were as highly prized as glass. Indeed, the grinding of multi-layered glass beads to remove blue and white glass layers that obscured the red glass beneath them has been argued to have been done to imitate red stone beads (Boyle 1904:13, 25, 468; Lennox and Fitzgerald 1990:436). If this was the objective, it suggests the equal or greater value accorded to red stone specimens (Fox, Conolly, and Hawkins 2023:100).

Across North America, stone beads are extremely rare until well into the Archaic era. In the Northeast, the earliest widely distributed beads are primarily of marine shell, as well as a limited number of native copper specimens which date to the terminal Archaic, some 3000 years ago (Donaldson and Wortner 1995:14, Figure 7, 40, Figure 38). These bead forms continue to be produced and widely distributed in the lower Great Lakes region throughout the early and middle periods of the Woodland era, but become rare during the subsequent Late Woodland period (Fox 2008:13). Stone beads are equally rare, being recovered in small quantities at St. Lawrence Iroquoian villages in southeastern Ontario where discoidal forms manufactured from black or grey steatite and yellow mudstone are reported (Pendergast 1966:35).

RED STONE BEADS

Archaeological evidence indicates that Iroquoian populations were aware of red pipestone, including catlinite, since the early 16th century (Boyle 1888:13, 28-29, Figure 27; Fox 2002:138; Witthoft, Schoff, and Wray 1953:92), although the production of red stone beads did not begin until the end of the century (Fox 2014). Evidence for the latter consists of an unusual assemblage of steatite beads from the Wendat/Anishinaabe Ball village dating to Glass Bead Period 1 (ca. 1580-1600) (Kenyon and Kenyon 1983:59-60, 66) (Figure 1). Geochemical analysis by pXRF indicates that a series of natural grey- to black-colored steatite disc beads display the same chemistry as red to pink specimens, strongly suggesting that the latter beads were thermally altered (heated) to produce the unnatural red color. Furthermore, a fragment of red siltstone from the Ball village evidences stone bead production, anticipating the early-17th-century industry that developed in the Blue Mountain region (Fox 1980) and eastern Wendake (Sykes 1983).

Excavations at the subsequent village of Cahiagué that dates to the first decades of the 17th century (Heidenreich 2014; Manning et al. 2019) have produced some of the earliest evidence of red siltstone bead production with an assemblage dominated by discoidal forms but including tubes (Sykes 1983:234-238, Plate 69). This industry blossomed at sites of Glass Bead Period 3a during the 1630s: the Petun/Odawa Hamilton-Lougheed village of Ehwae and the Jesuit Mission of St. Pierre and St. Paul (Garrad 2014:208, Figure 5.1, 357, Table 7.4) (Figures 1-2). This Odawa tubular-bead industry (Fox 1980:97, 1990:464; Garrad 2014:348, Plate 7.1) ended abruptly when the Petun and Odawa abandoned the Georgian Bay region in 1650, moving to Michilimackinac by 1652 (Garrad 2014:502, Figure 11.1). This termination is reflected in early-17th-century Seneca village assemblages which include tubular red siltstone beads (Sempowski and Saunders 2001:271-272, Figures 3-217, 544-545, 7-224), and where the latest site producing a red siltstone bead is the Warren village, dating to 1630-1650 (Figure 1).

Figure 1. Sites referenced in text (image: Andrew Stewart).

Figure 2. Red siltstone beads from the Neutral Lake Medad site (unless otherwise stated, all photos by William Fox, enhanced by John Howarth Photography).

The earliest catlinite bead documented in the Blue Mountain region is a tubular specimen recovered from the 1616-1642 Graham-Ferguson village (Fox 1980:95, Figure 8.1; Garrad 2014: 357, Table 7.4). This famous red pipestone, one of several types available in the Midwest (Tremblay and Noel 2021:43; Wisseman et al. 2012), was quarried at a site in southwestern Minnesota (Woolworth 1983). At roughly the same time, Norwood chert from the northeastern shore of Lake Michigan began to appear on Petun/Odawa sites in the 1630s (Fox 1992a:54). The timing is remarkably close to the date recorded in Odawa oral history for the expulsion of the Mascouten and the establishment of the Odawa Nassauketon settlement at Arbre Croche on Little Traverse Bay (Assikinack 1858:307-308). This first Odawa settlement in the Lake Michigan basin was adjacent to the Norwood chert quarry (Fox 1992a:56) and closer to the catlinite source area (Figure 1).

Fifty-four catlinite beads from Neutral sites in the collections of the Smithsonian National Museum of the American Indian (Fox 2020) range from a tubular specimen 81.4 mm in length to a discoidal bead 3.3 mm in thickness. The majority of the beads are tubular in form with round to rectangular or triangular cross-sections. Six specimens display edge notching, three of which have zigzag-incised faces (Fox, Hawkins, and Harris 2023:181) (Figure 3). Similar to the arrival timing of these exotic items on Petun/

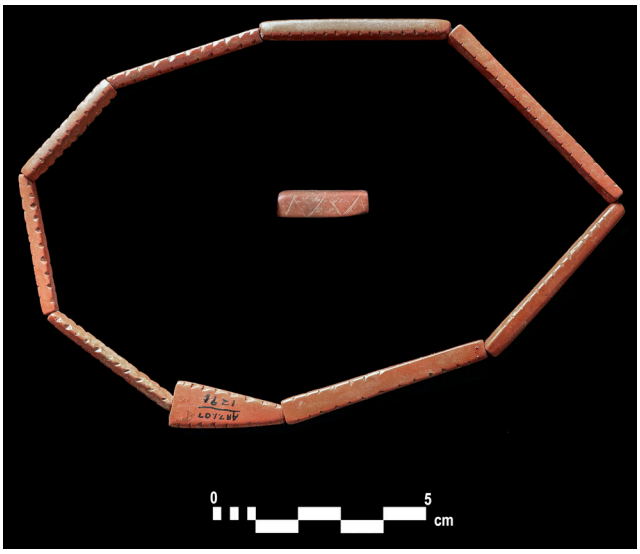

Figure 3. Catlinite beads from late 17th-century Seneca sites.

Figure 4. Catlinite "plains style" pipe from the Neutral Lake Medad site.

Odawa sites of the Blue Mountain region, the earliest Neutral catlinite specimens derive from graves 11 and 49 at the Grimsby cemetery (Kenyon 1982:76, Plate 77, B, Q, S [the latter is triangular-sectioned with edge notching]) dating to the 1630s (Kenyon and Fox 1982:9, 12). Likewise, the earliest catlinite beads among the Seneca include four specimens, one displaying edge notching, from the Warren site (ca. 1630-1650) (pers. obs.).

Following the Blue Mountain diaspora, local Odawa were joined by Odawa from Thunder Bay (Michigan), Manitoulin Island, and Michilimackinac in a move to Rock Island in the Green Bay area to avoid Iroquois attacks (Mason 1986:16). They were joined by some Petun (referred to as "Huron" in the French records and then Wyandot) before traveling south to the Upper Iowa River region, as documented by Nicholas Perrot (Fox 2002:146). There they met with the Ioway tribe who were described as poor by Father Louis Andre in 1676, noting: "their greatest Wealth consists of ox-hides and of Red Calumets" (Thwaites 1900:203), a reference to their direct access to the catlinite deposits.

An early Plains-style pipe of catlinite identical in form to several from the 1640s Lake Medad Neutral village (Figure 4) was recovered from the Hogback site, a 17th-century Ioway cemetery on the South Fork Root River in southeastern Minnesota (Wilford and Brink 1974:11, 12, 36, 37, 74 Plate 8b). Interestingly, an Ontario Iroquoian-style stone panther effigy pipe was recovered from a grave on the Upper Iowa River in northeastern Iowa (Laidlaw 1915:60, no. 5), just to the south (Figure 1).

By the end of the century, many Odawa had returned to the straits region of northern Lake Michigan, including St. Ignace where Michigan State University rescue-excavated the Lasanen cemetery, which Charles Cleland (1971:144) proposed "could be the St. Ignace Ottawas who were Cadillac's hosts at a Feast of the Dead between 1694 to 1697." The cemetery produced "152 catlinite artifacts… recovered from 11 burial pits," including pendants, tubular beads, and most importantly, evidence of manufacturing activity (How 1971:41). Fifty-six tubular beads vary from rectangular to circular or triangular in cross section, while an additional three display edge notching (How 1971:46-48, Figure 28). Lengths vary from 13.5 to 58 mm (How 1971:50-51, Table 4), similar to mid-17th-century Seneca specimens, while perforation diameters are comparable (Fox, Hawkins, and Harris 2023:182). Edge notching appears to grow in popularity through time at Seneca sites in New York and Ontario (Fox, Hawkins, and Harris 2023:182-183). An increasing number of French males on Seneca village sites (Fox 2023:112) and their integration into these and other Indigenous communities may be reflected in a unique multi-drop necklace found around the neck of a young female on a mid-17th-century Seneca site (Figure 5). The donor, if not producer, of this gift had likely seen this style of necklace worn by European women.

THE COLOR RED

Ian Kenyon (1984), in a masterful review of glass bead chronology as reflected in bead color trends during the 16th-17th centuries, considered the significance of the color red

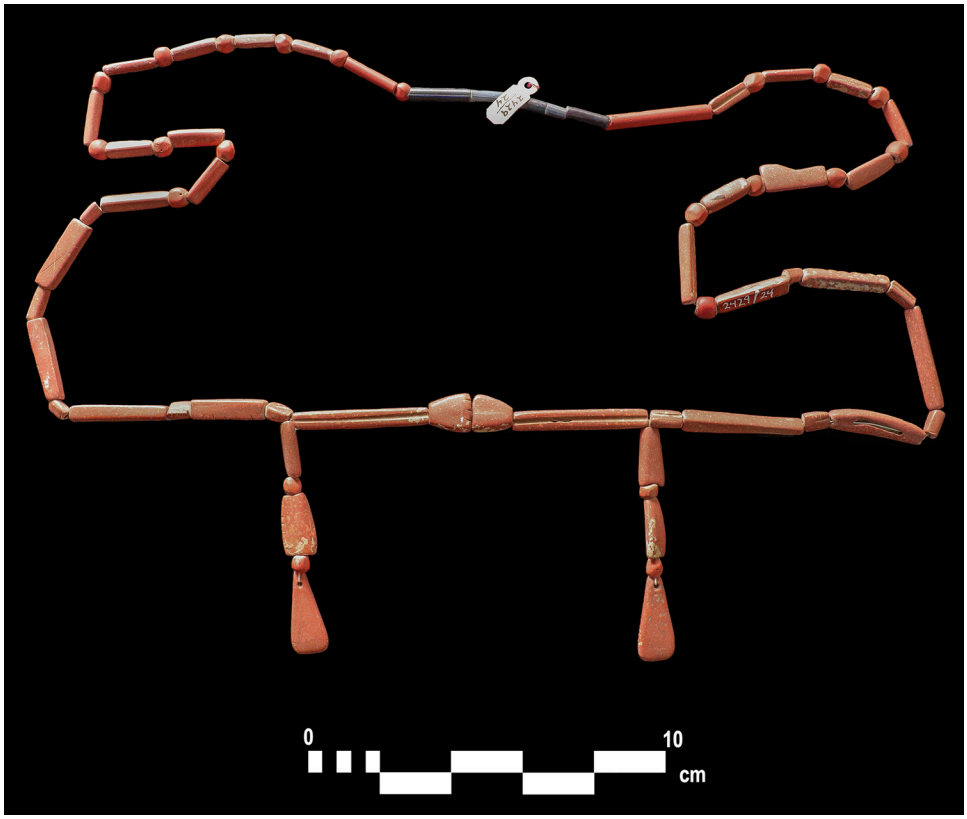

Figure 5. Catlinite and glass bead multi-drop necklace from the Seneca Power House site.

to Indigenous communities of the Great Lakes region. He documented the grinding of multi-layered glass beads to reveal underlying red layers beginning in the second or third decade of the 17th century (Kenyon 1984:11, Figure 2). But why this focus on red, as opposed to white and/or blue? George Hamell (1983:7), in an extensive consideration of glass bead color symbolism among Northeastern Indigenous groups, states that "'redness' connotes the animate aspect of life." He further notes that "berries and fat are symbols of physical and spiritual well-being… While serving to signal spatial and temporal liminality in myth and ritual, berries are also a substance by which these threshold states-of-being are positively resolved" (Hamell 1983:7). He provides numerous ethnographic and ethnohistoric references concerning the spiritual and ritual importance of red berries – particularly strawberries – to Iroquoian peoples, including their medicinal use for "physical and spiritual renewal" (Hamell 1983:9).

The transition in steatite bead color from natural black and grey to manufactured red at the turn of the 16th century and the acquisition of red siltstone during the subsequent decades of the 17th century coincide with the intensified interaction of northern Iroquoians with Europeans and the transmission of various diseases (Fox 2023:112). The "red shift" in glass bead color documented by Kenyon (1984:4-6, Figure 1) from ca. 1620 to 1651, as expressed in Ontario Iroquoian bead assemblages, coincides with one of the worst periods of European transmission of various diseases, including smallpox, documented during the fourth decade (Trigger 1987:526-534, 588-595). The Iroquoian perception of the spiritual nature of these ailments is reflected in the Huron/Wendat accusations of Jesuit witchcraft (Trigger 1987:534-538), and their earlier (1626) branding of Recollect Father Joseph de La Roche Daillon as an "Atatanite" – one who utters spells or a witch in modern parlance (Fox, Hawkins, and Harris 2023:104; Langdon 1981:4). The inclusion of red glass tubes in Ontario Iroquoian and Odawa mortuary sites (Fox, Hawkins, and Harris 2023:99-100) is consistent with the reported presence and importance of strawberries along the road to the spirit world or "heaven road" of the Seneca and "their inherent power of physical and spiritual renewal" (Hamell 1983:8-9). Red tubes are all but gone in the Seneca glass bead sequence by 1670, and are replaced by pea-sized round red beads which disappear by the end of the century (Wray 1983:44-45). Among the Seneca collections, catlinite beads appear to be most abundant at the Dann and Marsh village sites which date ca. 1650-1675, and are in decline by 1680 (pers. obs.).

THE SERPENT AND THE NOTCHES

In addition to red stone, there is another medium in which incised serpentine images and edge notching occurs on 17th-century Iroquoian sites, i.e., "tally beads," what old-time collectors called the tubes fashioned from mammal long bones found at Neutral village and mortuary sites, such as the Dwyer ossuary (Smith and Murphy 1939:6, Plate IV) (Figures 1, 6). Ridley (1961:49, 53) refers to these as "large bone tubes," recovered primarily from the Sealey, Walker, and Dwyer sites. Additional decorated and notched specimens have been recovered from the Walker site (Wright 1981:201, Figure 58, 9-10) and the Hamilton (Lennox 1981:395, Figure 45, 2-4) and Bogle 1 (Lennox 1984:283, Figure 25, 6) Neutral village sites. Walter Kenyon (1982:19, Plate 9, 48, Plate 35, 54, Plate 48, 115, Plate 106) refers to these items as "sucking tubes." All of these finds date to GBP 3 (ca. 1632-1651) (Kenyon and Fox 1982:7), a time of extreme social stress for the Neutral who were "destroyed" in 1651 (Jackes 2008:368). Significantly, the GBP 2 (ca. 1600-1632) Neutral Christianson village yielded none (Fitzgerald 1982), leading Lennox and Fitzgerald (1990:423) to note that "these tubes are restricted to the Neutral. Also, within the Neutral sequence, these tubes are a sensitive temporal indicator, being recovered from sites belonging to the A.D. 1630-1650 era" and opine that "it may be that these tubes represent [a shamanic] implement developed as an attempt to combat the psychological and physical trauma initiated by the post-A.D. 1634 epidemics."

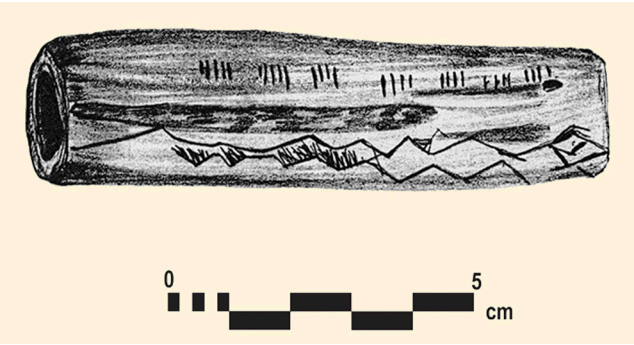

Figure 6. Incised bone "sucking tube" from the Neutral Dwyer ossuary (image: Ethel Smith).

Yet another medium used to depict serpents is native copper, which Hamell (1983:7, 16-17) equates to the color red and describes its ritual use "through reciprocal exchange with the Under(water) World Grandfathers." Mishipezheu, the great underwater panther, owned the native copper of the Great Lakes and controlled hunting success and weather, particularly storms on the lakes. He was assisted by the horned serpents (Fox 1992b:5). Native-copper serpents of various sizes (Figure 7) are widespread from protohistoric Oneota sites on the Iowa River (Wedel 1959:72) to early historic sites in the Lake Michigan basin (Bluhm and Liss 1961:115, 126-127, Figure 66; Brose 1970:211, Plate XXXV, h; Quimby 1966:42-43, Figure 16), and include a small specimen from the ca. 1630-1650 Ludlow-Vanderlip site (Kenyon 1972:1), a satellite settlement to the Neutral Sealey village.

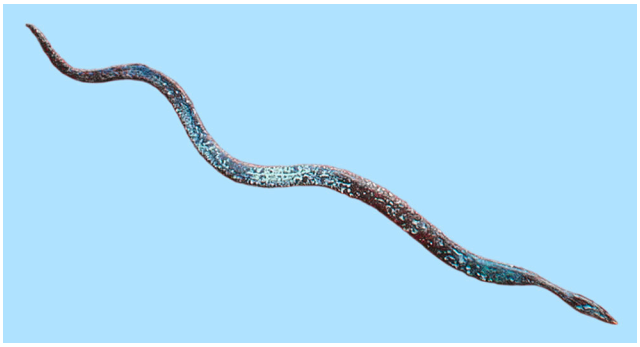

Figure 7. Native-copper serpent effigy from the Sault Ste. Marie region (courtesy: William Ross).

CONCLUSION

A trickle of tubular catlinite beads entered the lower Great Lakes region beginning in the fourth decade of the 17th century and became a flood in Seneca and other Five Nations communities following the mid-century Ontario Iroquoian diaspora. This appears to follow the termination of red siltstone beadmaking at village sites in the Blue Mountain region and the removal of the Wyandot and allied Odawa population to the Michilimackinac area in 1650. The juxtaposition of red stone beads with or without edge notching and rare incised serpentine motifs, and possible bone "sucking tubes" with or without edge notching and rare serpentine incisions, with a native-copper serpent on Neutral Iroquoian villages during the fourth and fifth decades of the 17th century, is striking and may be correlated with the disastrous epidemics sweeping Iroquoia during the 1630s, in particular. It is tempting to see the notching as a record of events, perhaps shamanic attempts at spiritual/medical healing, returning victims to health and well-being, or if unsuccessful, setting them on their way along the serpentine "ghost road" (Bender 2022).

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PRELIMINARY ANALYSIS OF THE STONE, GLASS, AND METAL BEADS, AGUSAN RIVER VALLEY, MINDANAO, PHILIPPINES

Igal Jada San Andres

The Agusan River Valley in Mindanao, Philippines, has great archaeological significance, particularly for the Age of Contacts and Trade. Intensifying pothunting activities, however, complicate the systematic study of the region due to the loss of the artifacts' stratigraphic context. This article is concerned with the archaeological research potential of beads recovered from disturbed contexts by presenting results from the multi-level analysis of 200 stone, glass, and metal beads donated to the Agusan River Valley Archaeology and Heritage Project. Descriptive and typological analyses reveals a preference for certain bead shapes and colors, while preliminary compositional analysis identifies similarities with colorants used in glass beads excavated in Indonesia, Malaysia, and Singapore. These results provide insights into the cultural lives of precolonial communities along the Agusan River Valley and their participation in a wider interregional exchange network.

INTRODUCTION

The Agusan River Valley spans the provinces of Agusan del Sur and Agusan del Norte in the Caraga region of Mindanao, Philippines (Figure 1). The archaeological potential of this area is well-established, particularly for the Age of Contacts and Trade with the East from the 10th to 16th centuries (Fox 1970). Present-day Butuan City figured in the Southeast Asian maritime trade between the 10th and 13th centuries. The existence of a thriving riverine entrepôt in the region is attested to by records of tribute missions to Song-dynasty China (Bolunia 2014; Gamas 2020), toponyms and geological studies (Bolunia 2014, 2017), and a wealth of archaeological finds, including wooden lashed-lug boats discovered in Barangay Libertad that are dated between the late 7th and 10th centuries (Lacsina 2020).

Prestige goods, found in burial contexts, have also been found in the region. Wooden coffins, tradeware ceramics, porcelain figurines, iron and bronze implements, ivory, glass beads, and gold fragments and ornaments have been

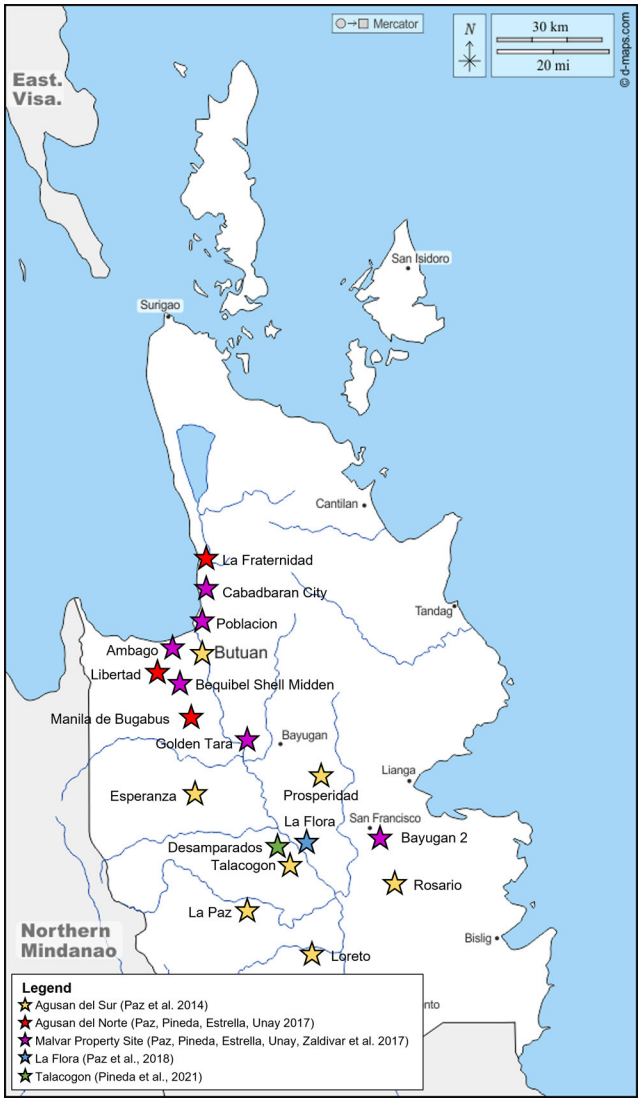

Figure 1. The location of sites surveyed and/or excavated by the Agusan River Valley Archaeology and Heritage Research Project (d-maps.com).

excavated from various archaeological sites in the valley, with dates ranging from the 10th to 19th centuries CE (Bolunia 2014, 2017; Burton 1977; Estrella 2016, 2018; Peterson 2011; Ronquillo 1987a, 1987b). The recovery of incomplete beads, crucibles, stone molds, and metal slag has raised the possibility of bead reworking and/or metal working in the valley (Paz et al. 2017; Paz et al. 2018; Ronquillo 1987a), while the abundance of worked and unworked gold materials highlights the importance of this precious metal in these precolonial communities (Bolunia 2014; Burton 1977; Estrella 2016, 2018; Gamas 2020; Paz et al. 2014).

Archaeological work in the valley, however, is complicated by the frequency of gold-panning and pothunting activities in the region. Since the 1970s, the provinces of Agusan del Norte and Agusan del Sur have been hotbeds for unsystematic excavation of precolonial burial sites. *Pag-aantik* is the local term for pothunting, with the *sonda* – a long, thin metal rod used to check for the presence of buried ceramics – as the pothunter's primary tool (Estrella 2018). Burton (1977), Paz et al. (2014), Peterson (2011), and Ronquillo (1987a, 1987b) report the destruction of potential sites that were heavily probed with *sonda*.

Pag-aantik continues to be prevalent in the valley and is done at a professional level, commissioned by financiers for antiquarian collectors (Estrella 2018; Paz et al. 2018). Unfortunately, materials recovered by pothunters lack the contextual information necessary for site interpretation (Burton 1977).

This article is concerned with the archaeological research potential of beads recovered from similar uncertain contexts. Due to their diminutive size, beads are rarely recovered from undisturbed contexts even in controlled excavations (Basilia 2011; Estrella 2016). Site disturbance due to rampant looting (Carter 2016; Francis 1991) or construction projects (Yankowski 2004) only add to this concern. But with the accessibility and availability of compositional analysis, the loss of stratigraphic context may not be as grave an issue for beads compared to other archaeological materials. Compositional data can aid in rebuilding *chaînes opératoires* for bead production (Lankton et al. 2006), identifying transition and manufacturing periods (Carter et al. 2016; Dong, Li, and Liu 2015; Dussubieux and Allen 2014; Henderson, An, and Ma 2018), tracing raw material sources (Carter and Dussubieux 2016), and understanding influences and interaction (trade) networks (Carter 2016).

Two hundred glass, stone, and metal beads randomly collected from various grave sites in the Agusan River Valley comprise the assemblage under study (Figure 2). The beads, along with a gold strip (Figure 3), were donated to the Agusan River Valley Archaeology and Heritage Research Project (ARVAHRP) in 2017 by a professional pothunter working in Agusan del Sur (Victor J. Paz 2022: pers. comm.). The ARVAHRP, which began in 2014 as the Agusan del Sur Archaeology and Heritage Project, is based at the School of Archaeology, University of the Philippines Diliman in Quezon City. The Project's scope has expanded from one province to the entire Agusan River Valley. Several surveys and excavations have been conducted by the project team in the Caraga region, with the primary objective of expanding our understanding of human/landscape relationships in the Agusan River Valley over time (Paz et al. 2014).

The randomized method of retrieval means that the bead assemblage and gold strip come from uncertain contexts. However, if we accept that the assemblage was, indeed, collected from Agusan River Valley sites, the beads and gold strip date between the 10th and 16th centuries. Previous systematic excavations in the valley recorded beads and gold ornaments in relative association with other artifacts dated to this period (Bolunia 2017; Burton 1977; Estrella 2016; Peterson 2011).

BEADS FROM PHILIPPINE ARCHAEOLOGICAL SITES

Fox and Santiago (1985) initiated the curation and development of the Philippine Bead Type Collection, with the assistance of chemist Jose B. Lugay. It is a significant resource for bead analysis: Fox and Santiago (1985) identified diagnostic bead types, assigned them to a period of Philippine prehistory (Fox 1970), and arranged them in chronological order. The collection, in essence, "established beads as chronological markers for relative dating" (Basilia 2011:14). In his analysis, Francis (2002:209) acknowledged the collection's import, as "[it] is the only countrywide data bank on beads anywhere in the world," but also noted that radiocarbon dates for Philippine sites were not well-established at the time. As such, it should be used with caution and understanding of its limitations (Basilia 2011; Francis 2002).

In assembling the collection, Fox and Santiago (1985) determined the arrangement based on when a specific bead type first appeared in the Philippine archaeological record and/or when it was manufactured in the Philippines. The earliest bead types in the collection were assigned to the Late Neolithic (ca. 1500-500 BC) and were made from shell, stone, and animal teeth.

This was followed by Metal Age types, divided into Early and Developed phases (500 BC-AD 1000), which marked the appearance of beads made of semi-precious stones (nephrite, jasper, agate, carnelian, and onyx), and

Figure 2. Select beads from the Agusan River Valley assemblage: a-b) agate/carnelian beads, c) crystal-quartz beads, d-g) opaque yellow glass beads in a variety of forms, h) translucent dark blue glass beads, i) opaque light blue glass beads, j-k) opaque dark green glass beads, l) opaque brown melon glass bead, m) opaque black bead of indeterminate material, and n-r) polychrome, translucent to opaque glass beads. The coin is 24 mm in diameter (all images by author unless otherwise indicated).

worked gold leaf, as well as Indo-Pacific glass beads, also called trade-wind beads (Francis 2002). These are small (>5 mm), usually opaque, and produced in a limited range of colors (Francis 2002). The Philippine Metal Age aligns with the production and exchange of high-alumina mineral-soda glass beads, specifically the m-Na-Al 1 and m-Na-Al 3 glass sub-groups in South Asia, Sri Lanka, and parts of Southeast Asia (Dussubieux, Gratuze, and Blet-Lemarquan 2010). Indeed, Lankton, Dussubieux, and Gratuze (2006) found compositional similarities between potash and mineral-soda

Figure 3. Worked gold strip donated with the Agusan River Valley bead assemblage; length: 157.6 mm.

beads from Metal Age deposits in the Tabon Cave complex of Palawan and glass samples from Khao Sam Kaeo in Thailand, a known manufacturing center for stone and glass ornaments. Three analytical instruments were used to obtain the compositional data presented by Lankton, Dussubieux, and Gratuze (2006): laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS), electron probe microanalysis (EPMA), and scanning electron microscopy and energy dispersive X-ray spectroscopy (SEM-EDS).

Evidence for local Indo-Pacific bead production is absent in the Philippine archaeological record and it is assumed that all glass artifacts were acquired through trade (Basilia 2015). Ronquillo (1987a) raised the possibility of glass beadmaking and reworking in Butuan, but more confirmatory evidence is needed in the form of a workshop, debitage, and associated structures. The imported nature of these glass beads imbued them with value and prestige, becoming markers of significance and wealth as evidenced in Philippine Metal Age burials (Barretto-Tesoro 2003).

Yankowski (2004) analyzed 130 Indo-Pacific beads recovered from a disturbed burial context in Tagbilaran City, Bohol, which is tentatively dated to the Philippine Metal Age (500 BC-AD 1000). They were found in association with earthenware vessels, iron implements, and fragments of glass bracelets. The beads were predominantly monochromatic red and yellow, and manufactured using two different techniques: drawing and winding. The assemblage also included a 14-sided opaque orange glass bead, which may have been modeled after semi-precious agate/carnelian beads.

At the Napa Property site in Catanauan, Quezon province, dated to the 1st-2nd centuries (Paz et al. 2016), Indo-Pacific beads have been found in association with primary and secondary jar burials and extended burials. Luga (2013) analyzed 989 beads from Locality 1, the majority of which were glass. Yellow (n=435) and orange (n=394) glass beads were the most numerous. The former was mostly associated with primary adult jar burials and occurred with other rare artifacts, such as a shell disc pendant, metal implements, obsidian, and a deer-antler pendant. Orange glass beads, on the other hand, were more closely associated with sub-adult burials, which also contained rare bead types – a blue Chinese bead, a green barrel bead, and a black barrel bead.

Basilia (2015) analyzed 222 beads from Locality 4 of the Napa Property site. Glass beads comprised most of the assemblage, with yellow (n=128) and orange (n=55) again being the most numerous.

Even with the arrival of imported glass beads, local bead production persisted during this period. Using multiple levels of analysis and experimentation, Basilia (2011) demonstrated that the development of drilling technology and the transfer of technological knowledge allowed the production of micro-perforated cut-shell beads at Ille Cave, El Nido, Palawan. In the Quezon province, Basilia (2015) posited the possibility of local production of dolomitic-limestone beads.

The first millennium, which corresponds to the beginning of the Age of Contacts and Trade, marked the decline (but not disappearance) of Indo-Pacific beads and the arrival of Chinese-made beads (Carter 2016; Francis 2022:76-77). Fox and Santiago (1985:13) noted the appearance of "[multicolored] glass beads with complex designs," as well as coiled, melon, eye, local brass, gold, chevron, and large stone (jasper, carnelian, and quartz) beads. The coiled, melon, and eye beads are generally ascribed a Chinese origin (Adhyatman and Arifin 1996; Fox and Santiago 1985). Coiled beads, in particular, were among the most numerous and traded extensively in East and Southeast Asia, dominating the bead trade in the Philippines from ca. 1200 to 1450 (Francis 2002). Lead appears to be a common ingredient in the trade beads of this period.

In Barangay Libertad, Butuan City, glass beads were excavated in association with Song-dynasty tradeware ceramics dated to the 10th-13th centuries. This was also reported by Peterson (2011) for the Masago site in Agusan del Norte. At the Marsan Durango site 1 in Talacogon, Agusan del Sur, Pineda et al. (2021) found a fragment of a broken glass bead that appeared to be coiled.

Beads have also been found in association with archaeological materials (including clay crucibles and molds made of fired clay, stone, and lead) from the 15th-16th centuries at many archaeological sites in and around Butuan (Estrella 2016). At least two comparative compositional studies of Philippine glass beads relative to other Southeast Asian glass samples for this period have been conducted.

Carter et al. (2016) analyzed lead-potash glass beads from jar burials in the Cardamom Mountains in Cambodia, and compared them to beads from the 14th-century Fort Canning site in Singapore and a previously unpublished collection from the Philippines. These beads are from the site of Tanjay, Negros Oriental, in the Philippines (Laure Dussubieux 2022: pers. comm.). Tanjay is dated from the 15th to the beginning of the 16th century. Paste and glass

beads are classified as prestige goods at this site as they occur in burials with other valued foreign and local items such as porcelain, bronze, decorated earthenware, and bone ornaments (Junker 1999; Orillaneda 2016). There are compositional similarities between the three sites, but the Cardamom Mountain beads were more similar to those from the Philippines, based on the concentrations of Li and Rb. These results indicate that both lowland (Tanjay) and upland (Cardamom Mountains) communities participated in the regional maritime exchange network. They also underscore the research potential of glass beads in demonstrating the direction and extent of trade.

Using LA-ICP-MS, Craig (2021) and Craig and Dussubieux (2022) analyzed 85 glass beads excavated from three Philippine shipwrecks of the 15th-17th centuries: Pandanan (southern Palawan), Santa Cruz (Zambales), and Royal Captain Shoal wreck 2 (west of Palawan). The results showed three broad directions of exchange and identified regional market shifts in Southeast Asia and the Indian Ocean exchange networks. The first period is associated with the Pandanan shipwreck (1460-1487) which carried drawn red and black mineral-soda beads stored in Thai jars. The Santa Cruz shipwreck (1488-1505) carried wound, blue lead-potash beads associated with Longquan celadon and black and yellow mineral-soda beads in Thai ceramic containers. The Royal Captain Shoal wreck 2 (1573-1620) carried lead-potash beads of multiple monochrome colors in association with Chinese blue-and-white ceramics. These changes in cargo reflect shifts in manufacturing regions – from Chaul, India, in the 15th century to China in the 17th century – and, in consequence, bead compositions, colors, and forms.

Cayron (2006) previously studied the Pandanan shipwreck's glass beads which were contained in Vietnamese stoneware jars. He compared 60 red and 144 black beads from Pandanan with those from Sungai Mas in Kedah, Malaysia, demonstrating similarities in style, form, and technology between the two sites. Chemical analysis was not conducted on the beads due to the cost, insufficient comparative data, and the chemical deterioration of the glass.

METHODOLOGY

The Agusan River Valley bead assemblage was analyzed using descriptive and compositional methodologies. Descriptive analysis of the entire bead assemblage was conducted using a digital caliper, 10x tabletop magnifier and lamp, and a *Munsell Bead Color Book* (Munsell Color 2012). The length and diameter of a bead, along with the diameter of the perforation, were measured in millimeters. Shape, color, diaphaneity, and ornamentation were also noted. The method of manufacture was determined by observing the direction of striations on glass and the rounding of facets on stone beads. Specimens with no visible striations or other evidence relating to manufacture were labeled "undetermined." These methods are in accordance with published guidance for archaeological bead analysis (Cayron 2006; Francis 1991, 2002).

Of the 200 beads, 18 were selected for further chemical compositional analysis using portable X-ray fluorescence (pXRF) spectrometry (Figure 4). Based on their morphological attributes, these beads were representative of the colors, shapes, and materials of the entire assemblage. The least-weathered specimens were selected for this phase to minimize the effects of post-depositional deterioration, burial, and submersion on the beads' chemical compositions (Lamb 1965; Tamura, Nakamura, and Truong 2020). Liu et al. (2012) found the major glass ingredients Na, K, Al, and Ca to be especially volatile in measuring the chemical composition of weathered glass beads. Fe and Ti were likewise unpredictable, while Mn appeared to be the least affected by weathering. These findings shall be considered in the interpretation of the results.

The 18 samples were analyzed using a Vanta handheld XRF analyzer with a silicon drift detector at the Lithics Laboratory of the School of Archaeology, University of the Philippines Diliman. The analyzer was placed on a docking station. Each sample was mounted in a shielded sample chamber where it was subjected to two beams of differing light concentrations. Beam 1 (40.0 kV) measured Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Rb, Sr, Y, Zr, Nb, Mo, Ag, Cd, Sn, Sb, Ba, W, Hg, Pb, Bi, Th, and U. Beam 2 (10.0 kV) measured Mg, Al, Si, P, S, K, Ca, Ti, and Mn. Light elements (LE) were excluded from measurement.

The Agusan River Valley bead assemblage was also entered into an inventory and provisionally given the accession code [unprov]-XIII-[2022]. This is in accordance with the National Museum of the Philippines's convention for accessioning archaeological sites (Peralta 1978). For this assemblage, however, the assignment of such a code is for the purpose of the inventory only. The term "unprov" and year were placed in brackets to acknowledge the lack of provenience and indicate the date of accession, not the date of recovery.

DESCRIPTIVE ANALYSIS

The Agusan River Valley assemblage is composed of glass, stone, and metal beads, with the first being the predominant material (Figure 5). Following Santiago (2003) and Cayron (2006), a typological flowchart was prepared.

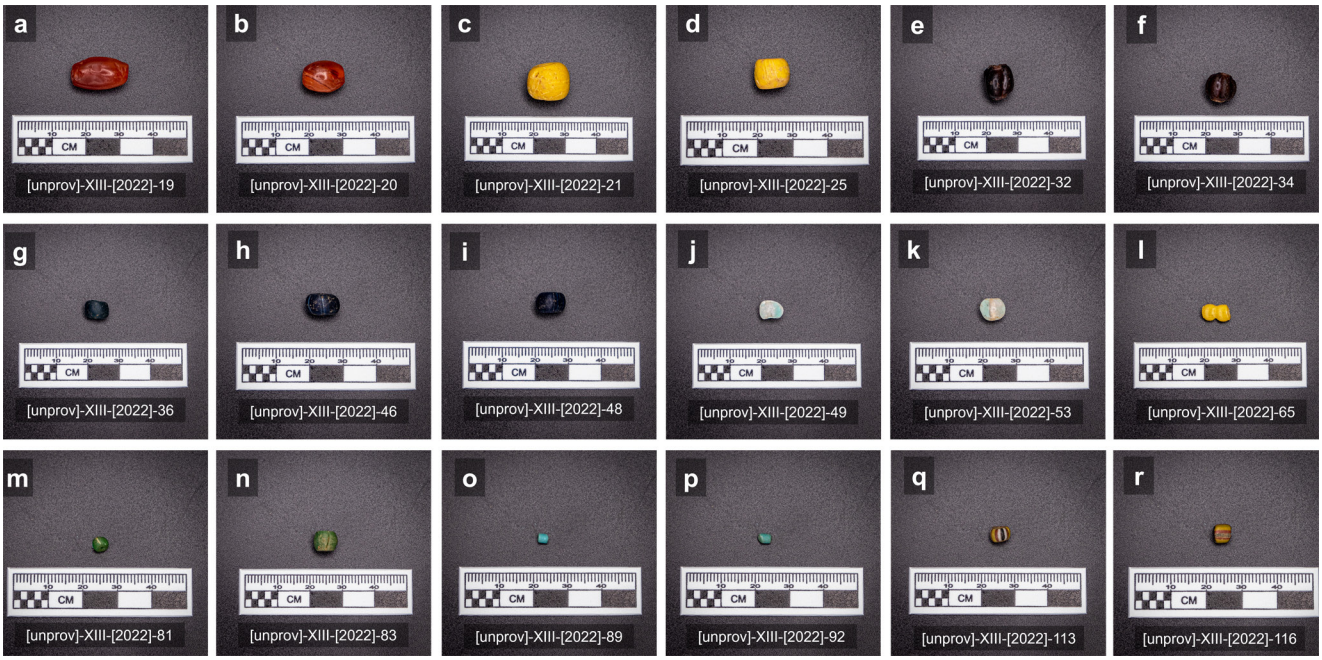

Figure 4. Stone and glass beads selected for pXRF analysis: a-b) agate/carnelian beads, c-d) opaque yellow glass beads, e-f) opaque brown melon glass beads, g) translucent dark shadow blue glass bead, h-i) translucent dark navy glass beads, j-k) crystal-quartz beads, l) opaque yellow segmented glass bead, m-n) opaque dark green glass beads, o-p) opaque light blue glass beads, and q-r) polychrome, translucent to opaque glass beads (photo: Adrian Peter Cartalaba).

The general color of the beads was noted, not their *Munsell Bead Color Book* codes. A total of 34 bead types were identified: 3 stone, 30 glass, and 1 metal (Figures 6-7).

Stone Beads

There are 27 stone beads in the assemblage, visually identified as agate/carnelian (red) and crystal quartz (white). They represent two shapes: barrel and oblate. The average length of the former is 14.5 mm, with a diameter of 9.65 mm. The oblate beads are short, averaging 5.72 mm in length and 6.72 mm in diameter.

The manufacturing method could not be identified with certainty, but all the beads appear to have been tumble-polished, as opposed to abraded, due to the rounded appearance of their facets and edges. The beads were drilled from either one (for oblates) or both (for barrels) ends, as evidenced by the extensive chipping around the perforations (Figure 8). Carnelian beads from Lovea and Sophy in Cambodia exhibit the same scarring, which is "indicative of expedient and less-careful bead production" (Carter et al. 2022) as the damage caused by drilling results in an uneven spherical shape. Drilling from both ends is visible when [unprov]-XIII-[2022]-19 and -20 beads are held to the light: the silhouettes of the perforations are angled and meet in the middle.

Glass Beads

Both monochrome and polychrome glass beads are part of the Agusan River Valley assemblage. Of the former, yellow is the predominant color, with 94 beads in total. Blue (n=32), green (n=22), brown (n=4), and black (n=1) monochrome

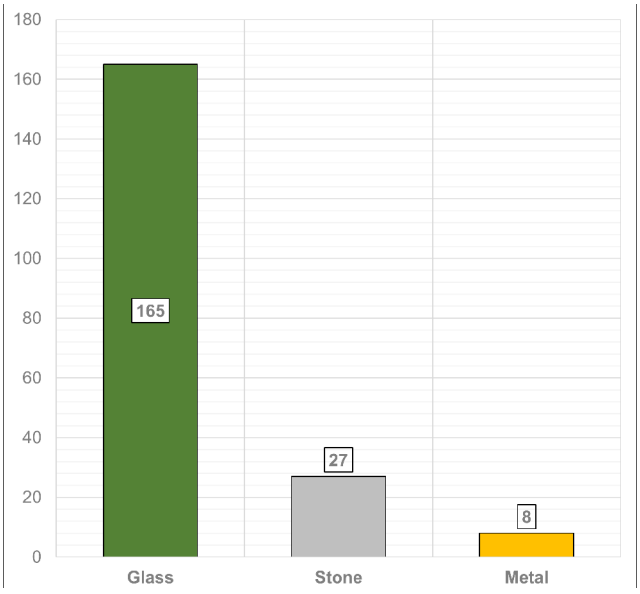

Figure 5. The Agusan River Valley bead assemblage, by material.

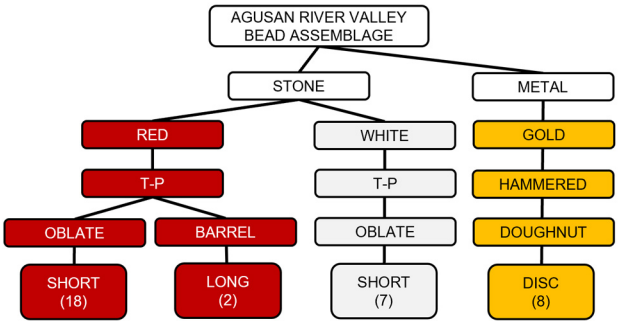

Figure 6. Typological flowchart of the stone and metal beads in the Agusan River Valley bead assemblage.

beads are also present (Figure 9). The polychrome beads have base colors of either brown (n=10) or yellow (n=2). They are decorated with yellow, blue, red, black, and white longitudinal stripes. The majority (n=137) are opaque, while 16 beads are translucent. The 12 polychrome beads exhibit different levels of opacity: their perforations are visible through the glass when held to the light, while the bodies are opaque.

Most of the beads are drawn (n=119), while 35 are labeled "undetermined" since no striations were noted on magnification. Eleven specimens may have been made by winding.

Five bead shapes are represented: barrel, doughnut, melon, segmented, and tubular. The average measurements for each shape are indicated in Table 1. The doughnut shape is the most common, with 90 beads in total occurring in yellow, light blue, green, and black. Only four could be classified as true discs (Cayron 2006). Eighty-five are classified as short, while one bead is long ([unprov]-XIII-[2022]-104). There are 49 barrel and 17 tubular beads.

The eight melon beads are of two colors, opaque yellow and translucent brown, and exhibit variations in the number of pressed lobes, e.g., the lobes of one specimen ([unprov]-XIII-[2022]-33) are not as prominent in comparison with the other melon beads. Longitudinal striations visible on the surface indicate they were made using the drawing technique, rather than winding as described by Cole (2012). The Agusan melon beads also have rounded ends, unlike the flattened ends characteristic of both the small and large Tani melon beads, and do not exhibit horseshoe-shaped marks on their surface (Cole 2012).

Melon beads have existed for thousands of years, originating in Egypt, with the earliest forms probably taking inspiration from the lotus rather than the melon fruit (Eisen 1930). In Asia, they were first associated with the Han dynasty, "probably inspired by Western imports through the Silk Road" (Adhyatman and Arifin 1996:78). Kwan (2013) noted that many melon beads were found at sites dating to the Yuan Dynasty (1271-1368). In the Philippines, melon beads were "invariably excavated in sites associated with trade potteries from Asia" (Fox and Santiago 1985:13). They date to the Age of Contacts and Trade with the East (10th-16th centuries), and contain high levels of lead, but no barium.

The melon beads in this assemblage are smaller than those described by Cole (2012) and Kwan (2013), and seem to be closer in size to the yellow melon beads loosely dated to the 17th-19th centuries from Irian Jaya (Adhyatman and Arifin 1996). These latter beads probably originated in China and share the same rounded ends as the Agusan melons, though the "cuffs" on the latter appear to be more prominent.

Only one bead ([unprov]-XIII-[2022]-65) is identified as segmented. This form originated in the Middle East and was "made by constricting a heated tube to form bulges that are cut apart as single or multiple beads" (Francis 2002:11).

Metal Beads

The eight metal beads in the assemblage are classified as doughnut-shaped discs. Their average length is 0.44 mm, with

Table 1. Average Measurements (in mm) of the Glass Beads Based on Shape.

Shape	Quantity	Bead Diameter	Perforation Length	Perforation Diameter
Doughnut	90	5.04	2.39	1.82
Barrel	49	6.10	4.28	1.91
Tubular	17	3.32	3.62	1.07
Melon	8	9.55	9.29	1.98
Segmented	1	5.10	7.60	2.50

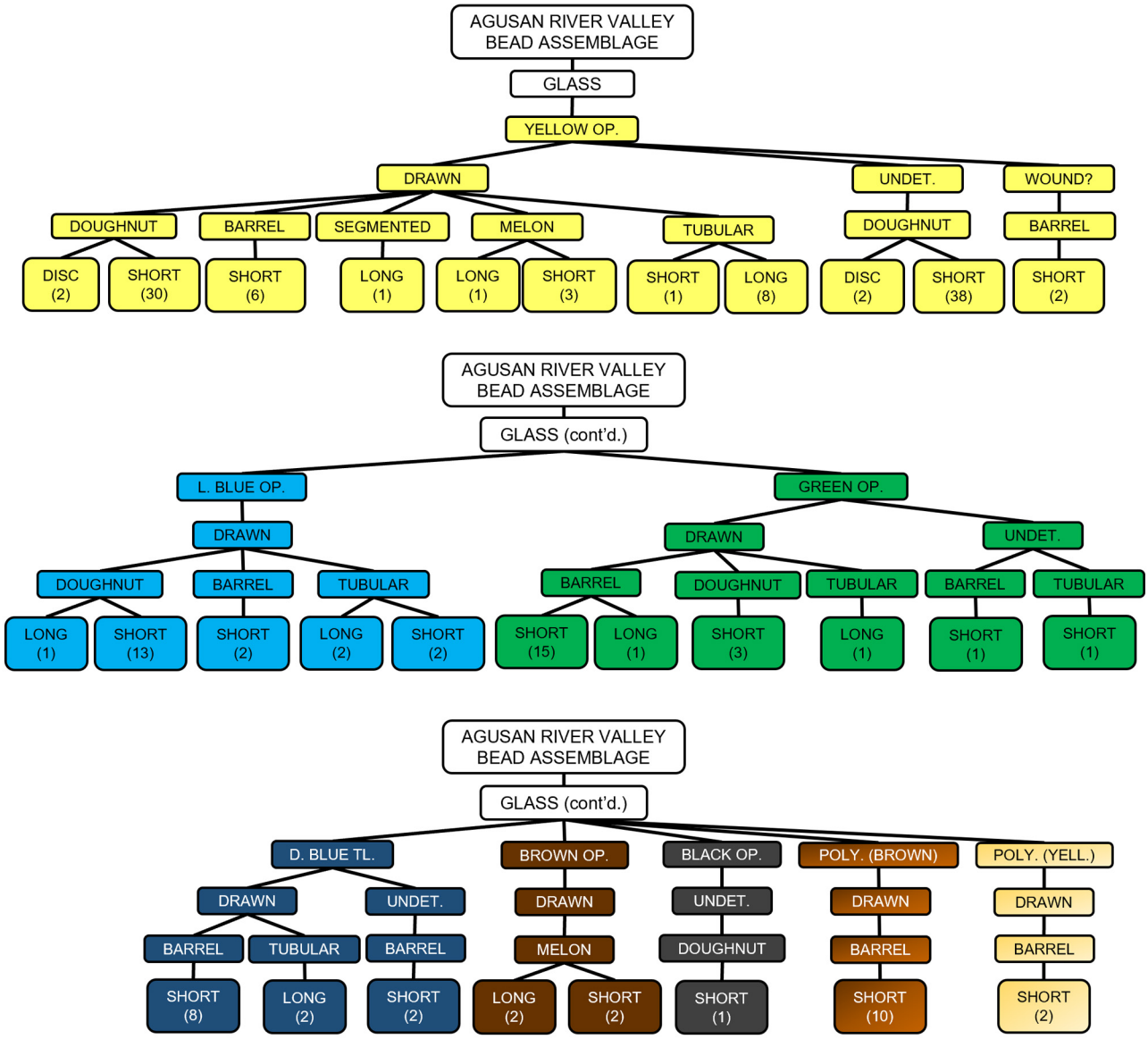

Figure 7. Typological flowchart of glass beads in the Agusan River Valley bead assemblage.

a whole-bead diameter of 4.9 mm and a perforation diameter of 4.05 mm. They appear to be made of gold. Evidence of manufacture is difficult to discern due to the size of the specimens, but they are assumed to have been fused and hammered, based on Estrella's (2016) description of similar circular beads at the National Museum Regional Branch in Butuan.

COMPOSITIONAL ANALYSIS

Four stone and 14 glass beads were selected for further compositional analysis using a pXRF spectrometer. The results are provided in Tables 2 and 3. The concentrations of the major elements are given in percent by weight (%), while minor and trace elements are in parts per million (ppm). Elements not detected are labeled "n.d."

Given the limitations of the pXRF spectrometer for provenance studies (Bonneau et al. 2014; Liu et al. 2012), the results of this analysis are preliminary and cannot be used to conclusively determine the chemical classes of the Agusan River Valley samples. Nonetheless, they present interesting insights that could be explored in future research.

Figure 8. Drilled perforations of stone beads.

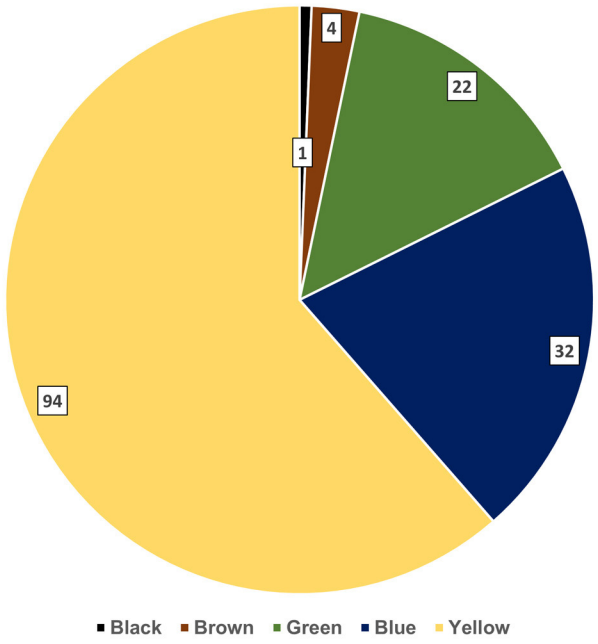

Figure 9. Glass bead colors of the Agusan River Valley assemblage (monochrome only).

Stone Beads

Two agate/carnelian and two crystal-quartz beads were selected for pXRF spectrometry. The Si content of all four is significantly lower than the values obtained by Carter and Dussubieux (2016). Whether this is an effect of surface weathering remains to be seen.

The Ni, Rb, Sr, Zr, Sb, Ba, and Y content of the beads also does not correspond to Carter and Dussubieux's (2016) published data set. These elements were identified as diagnostic for the geologic sources included in their study. In particular, the Ba concentrations in the four Agusan River Valley stone beads are elevated. These discrepancies likely stem from the limitations of pXRF spectrometry. In future research, a more sensitive technique, such as LA-ICP-MS or Instrumental Neutron Activation Analysis (INAA), should be used to improve precision so the results can be utilized for provenience studies.

Glass Beads

Fourteen glass beads were selected for compositional analysis. The major elements recorded for all specimens are Mg, Al, Si, K, and Ca. S, Mn, Fe, Sn, and Pb were present in varying amounts (i.e., wt% for some samples, ppm in others). Minor and trace elements include P, Ti, Ni, Cu, Zn, Sr, and Sb. Fourteen elements were detected in some but not all samples, namely: V, Cr, Co, As, Se, Rb, Y, Zr, Nb, Ag, Ba, W, Bi, and Th.

Cluster analysis was used to group the compositional data set into clusters using the statistical software IBM SPSS Statistics (2017). Only element concentrations present in all 14 samples were considered in the analysis, all of which are associated with colorants used during the manufacturing process. The use of certain coloring agents can be traced to particular workshops, periods of manufacture, or, at the very least, sites with glass beads colored using the same recipes.

Three groups were identified based on significant variations in S, Cu, Sn, Sb, and Pb (Figures 10-11). Mn, Ni, and Zn were also used, though their contributions to the final clusters are less significant.

Cluster 1 is composed of two opaque yellow barrel beads ([unprov]-XIII-[2022]-21, -25). This group is characterized by higher concentrations of Sn and middle-range Pb relative to the other clusters. Lead stannate ($PbSnO_3$) is a known yellow opacifier in glass beads and

Table 2. Compositional Data for Stone Beads Obtained by Portable XRF.

Accession No.	20	19	53	49
Method of Manufacture	tumble-polished	tumble-polished	tumble-polished	tumble-polished
Color	barn red	barn red	white	white
Opacity	translucent	translucent	translucent	translucent
Mg	n.d.	n.d.	n.d.	3000
Al	1480	1460	2730	n.d.
Si	56.69%	55.14%	49.56%	53.50%
P	283	205	n.d.	n.d.
K	n.d.	99	n.d.	n.d.
Ca	1019	1091	2.192%	393
Ti	320	390	n.d.	300
Mn	59	53	n.d.	123
Fe	475	316	346	75
Co	27	n.d.	52	47
Ni	25	16	29	29
Cu	5	10	35	29
Zn	9	13	12	15
As	3	n.d.	n.d.	n.d.
Se	4	3	9	7
Rb	3	3	8	7
Sr	5	4	7	5
Y	7	5	6	6
Zr	8	11	8	9
Mo	7	10	13	12
Ag	36	n.d.	n.d.	n.d.
Cd	32	14	n.d.	n.d.
Sn	42	75	73	50
Sb	35	72	115	75
Ba	830	1540	640	510
W	8	n.d.	n.d.	n.d.
Hg	n.d.	6	n.d.	9
Pb	5	9	13	11
Bi	22	49	69	57
LE	42.83%	44.32%	47.81%	46.03%

Table 3. Compositional Data for Glass Beads Obtained by Portable XRF.

Accession No.	21	25	32	34	36	46	48
Method of Manufacture	wound?	drawn	drawn	drawn	drawn	drawn	drawn
Color	mustard gold	mustard gold	dark brown	dark brown	dark shadow blue	dark navy	dark navy
Opacity	opaque	opaque	translucent	translucent	translucent	translucent	translucent
Mg	2.81%	1.51%	3.04%	2.51%	2.55%	2.12%	2.09%
Al	2.078%	3.777%	1.749%	1.794%	2.417%	2.034%	2.217%
Si	33.96%	30.34%	36.30%	35.35%	32.78%	36.40%	38.12%
P	813	3050	557	793	870	840	580
S	2.512%	2.695%	1830	1380	9230	2200	2490
K	2.622%	2.032%	2.024%	2.244%	1.968%	1.984%	1.603%
Ca	3.354%	3.061%	3.504%	3.143%	3.623%	3.617%	3.965%
Ti	990	1940	440	830	1210	1730	1460
V	n.d.	n.d.	n.d.	n.d.	97	175	n.d.
Cr	243	363	n.d.	111	131	n.d.	124
Mn	9060	5480	1.030%	1.624%	9010	1457	1805
Fe	5430	1.334%	4444	5090	8120	9720	1.169%
Co	53	n.d.	34	n.d.	277	500	490
Ni	66	96	49	45	92	84	120
Cu	82	372	29	24	1192	904	1015
Zn	82	88	20	39	140	71	50
As	2310	6180	9	5	n.d.	n.d.	n.d.
Se	34	61	5	7	n.d.	6	5
Rb	n.d.	n.d.	19	28	26	18	14
Sr	482	394	464	508	584	622	512
Y	n.d.	n.d.	9	9	n.d.	9	10
Zr	36	n.d.	68	109	87	117	104
Nb	90	287	n.d.	n.d.	6	n.d.	n.d.
Mo	36	77	17	4	19	12	15
Ag	41	59	26	n.d.	37	n.d.	20
Sn	1.455%	2.597%	101	75	4887	139	100
Sb	166	312	71	51	72	121	38
Ba	n.d.	n.d.	1750	1140	n.d.	1230	n.d.
W	62	107	19	20	n.d.	n.d.	16
Pb	6.957%	13.46%	33	14	2.305%	941	892
Bi	n.d.	n.d.	43	63	n.d.	67	36
Th	34	119	n.d.	n.d.	n.d.	n.d.	n.d.
LE	42.24%	37.29%	51.35%	52.30%	50.75%	51.76%	49.85%

Table 3. Continued.

Accession No.	65	81	83	89	92	113	116
Method of Manufacture	drawn	drawn	drawn	drawn	drawn	drawn	drawn
Color	mustard gold	dark palm green	dark palm green	light blue spruce	light blue spruce	polychrome	polychrome
Opacity	opaque	opaque	opaque	opaque	opaque	translucent to opaque	translucent to opaque
Mg	1.660%	1.19%	2.32%	2.17%	2.45%	2.63%	2.83%
Al	2.435%	2.91%	4.46%	1.931%	3.22%	1.941%	3.304%
Si	28.14%	21.37%	26.01%	26.31%	25.27%	34.37%	31.08%
P	310	540	760	320	790	763	828
S	1.193%	4.826%	6.251%	6.809%	7.326%	8740	6860
K	1.641%	1.261%	1.669%	1.545%	1.394%	2.020%	1.741%
Ca	3.415%	2.515%	2.862%	3.771%	3.409%	2.802%	2.789%
Ti	1120	2280	1850	630	1350	850	1310
V	n.d.	n.d.	n.d.	120	260	n.d.	105
Cr	273	406	429	350	265	140	n.d.
Mn	9420	677	534	327	619	9530	9090
Fe	6570	1.069%	1.060%	5010	7990	9560	7890
Co	n.d.	73	83	73	n.d.	n.d.	n.d.
Ni	63	89	96	76	78	45	46
Cu	75	8160	7230	6380	6680	3806	6951
Zn	67	1499	1473	1176	1061	1191	1222
As	765	1.456%	7290	8580	8630	1620	675
Se	14	130	n.d.	107	96	12	13
Rb	26	n.d.	n.d.	n.d.	n.d.	23	25
Sr	317	572	502	539	534	496	487
Y	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Zr	61	n.d.	n.d.	n.d.	n.d.	59	75
Nb	34	474	518	342	450	8	5
Mo	18	129	112	64	73	11	8
Ag	68	89	148	133	97	n.d.	28
Sn	6560	7850	7720	3.032%	2.929%	3143	1201
Sb	72	240	385	445	326	143	100
Ba	n.d.	1420	n.d.	n.d.	960	510	n.d.
W	n.d.	202	101	46	109	22	n.d.
Pb	3.762%	19.28%	19.28%	15.75%	18.39%	1.284%	9384
Bi	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Th	n.d.	128	187	145	107	n.d.	n.d.
LE	55.17%	41.60%	33.15%	36.19%	32.56%	50.88%	53.62%

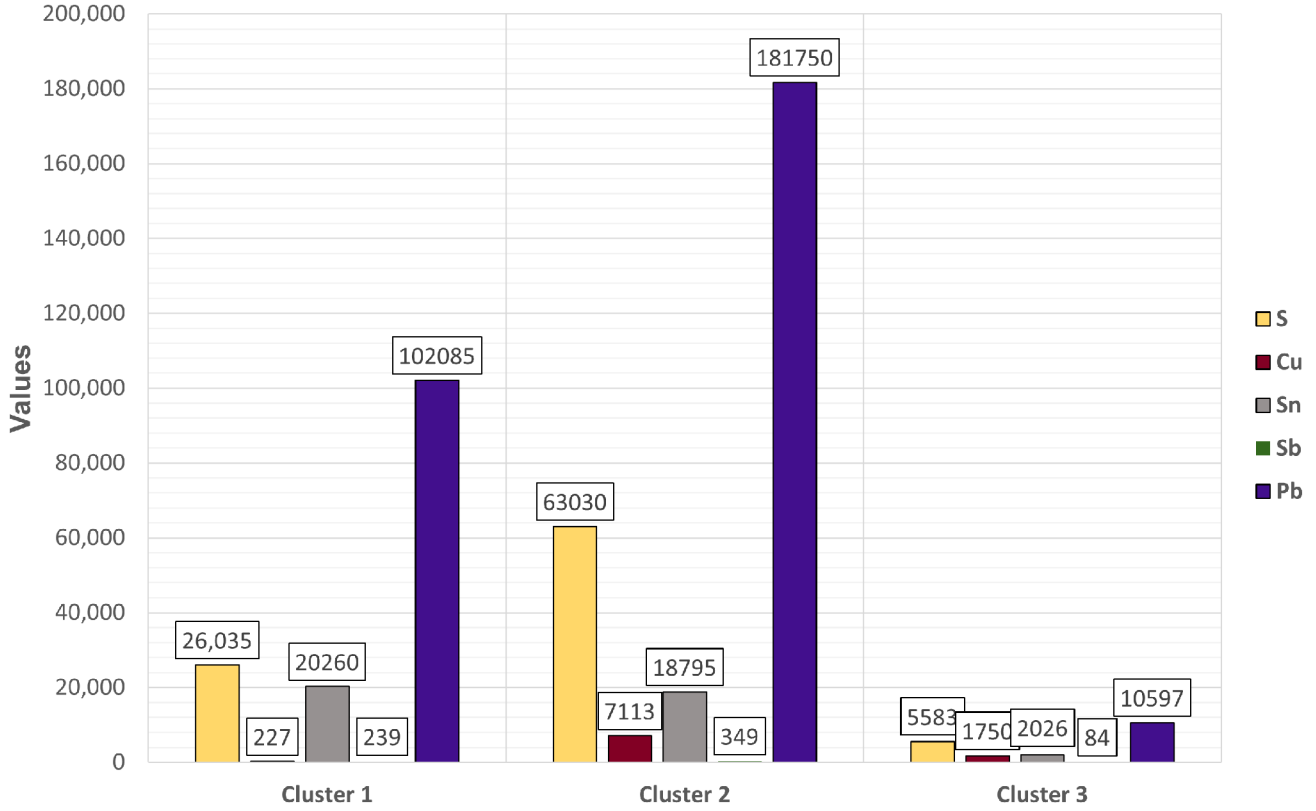

Figure 10. Clusters based on the chemical compositions of analyzed glass beads from the Agusan River Valley.

fragments from Indonesia (Dussubieux 2009), Malaysia (Dussubieux and Allen 2014), Singapore (Dussubieux 2010), and the Pandanan Island (Palawan) and Santa Cruz (Zambales) shipwrecks in the Philippines (Craig and Dussubieux 2022). The compositional results for both beads also indicate minor concentrations of Mn which may have been used to reduce the greenish tinge introduced by iron impurities in the sand used to produce the glass (Henderson 2013). These beads also contain major levels of S and As which could indicate the use of arsenic sulfide pigments as yellow colorants such as alacranite (As_8S_9) and orpiment (As_2S_3). Both pigments have been utilized in Japanese woodblock prints from the late Edo (1615-1868) and early Meiji (1868-1912) periods (Luo et al. 2016), as well as Chinese reverse glass paintings dated to the beginning of the 20th century (Steger et al. 2019).

Cluster 2 is composed of dark green and light blue beads ([unprov]-XIII-[2022]-81, -83, -89, -92). This group is characterized by significantly higher concentrations of S, Cu, Sb, and Pb and middle-range Sn relative to the other clusters. Ni and Zn are also elevated. The four beads appear to have been colored with a brass alloy, as evidenced by minor concentrations of Cu and Zn in association with Pb and Sn. The use of this combination as a colorant for blue glass has been recorded in Indonesia (Dussubieux 2009) and Malaysia (Dussubieux and Allen 2014; Ramli et al. 2017). Slight differences within the cluster can be observed: the dark green beads have higher levels of Cu and Zn compared to the light blue beads, suggesting that a slight increase in raw materials could produce a darker color (Dussubieux et al. 2010), a testament to the mastery and technical knowledge of early glassworkers.

Cluster 3 is composed of eight beads – two brown melon beads, one dark shadow blue bead, two dark navy beads, one yellow segmented bead, and two polychrome beads. This group is characterized by significantly lower concentrations of S, Sn, Sb, and Pb, as well as the highest levels of Mn, relative to the other clusters. Varying levels of Mn appear to be the primary colorant for this group.

The brown melon beads ([unprov]-XIII-[2022]-32, -34) may have been colored with MnO_2 as they are the only samples that contain major Mn levels. Ferric oxide (Fe_2O_3) has also been recorded as a brown colorant (Dong, Li, and Liu 2015), but the volatility of Fe due to surface weathering precludes a positive determination.

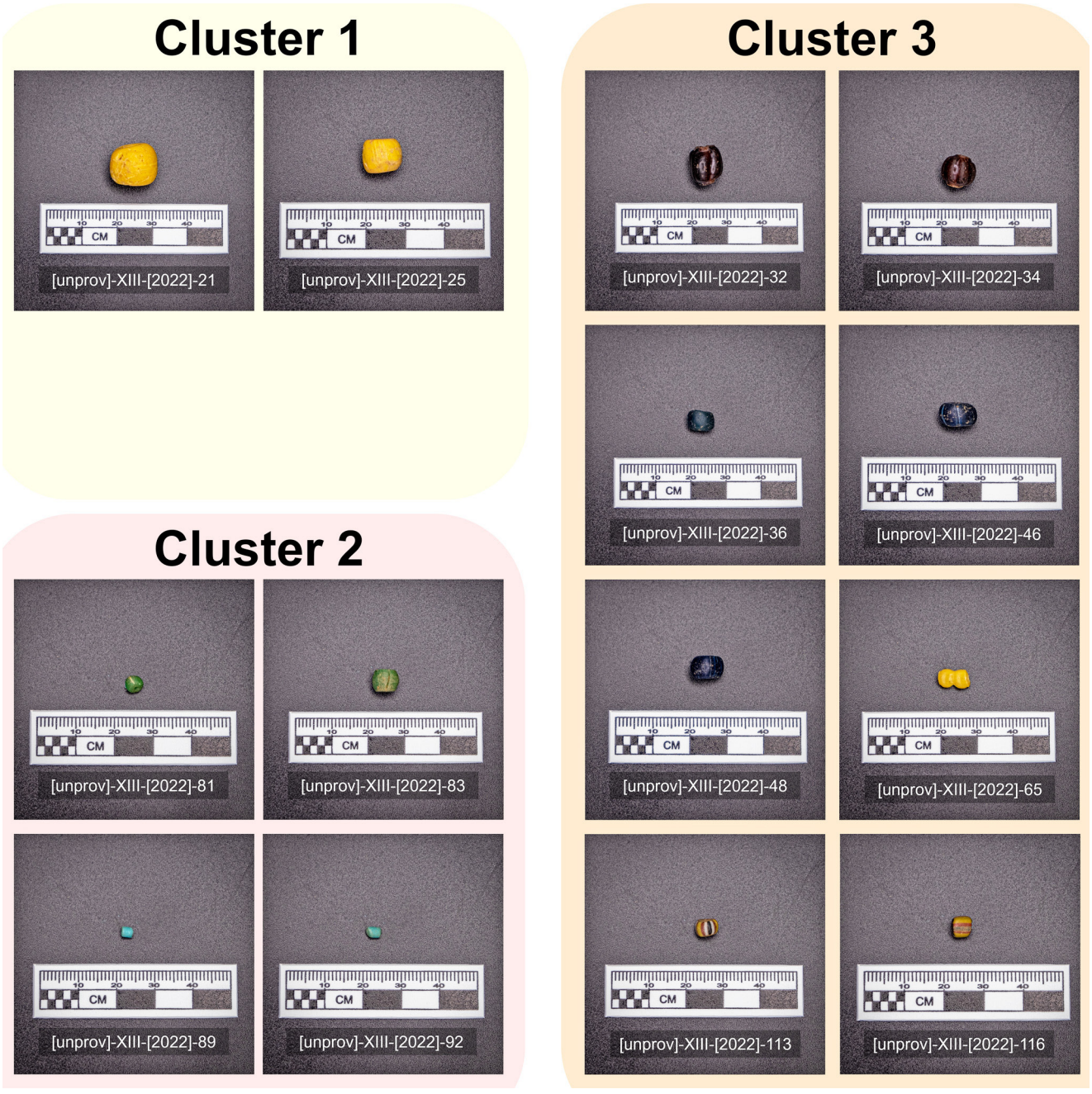

Figure 11. Summary of cluster analysis of glass beads from the Agusan River Valley.

The dark shadow blue and dark navy beads ([unprov]-XIII-[2022]-36,-46,-48) contain trace amounts of Co alongside minor Mn concentrations. These suggest a second type of blue colorant: a manganese-containing cobalt ore. Ono et al. (2018) note a Chinese origin for cobalt ores with manganese – as opposed to zinc-bearing cobalt ores (Dussubieux 2009) – which have been used as a blue colorant for potash glass. The dark shadow blue bead also contains relatively higher levels of S, Pb, and Sn, which could suggest another additive.

Though visually similar to the Cluster 1 beads, the yellow segmented bead ([unprov]-XIII-[2022]-65) was grouped in Cluster 3 due to its relatively higher Mn and lower S, Sn, Sb, and Pb levels. As content was also lower. Variations in the levels of As and Sn among the Cluster 1 samples and this segmented bead may be the contributing factor in the difference in grouping. Still, its S, Sn, and Pb concentrations are higher than the other samples in Cluster 3.

The final two beads in Cluster 3 ([unprov]-XIII-[2022]-113, -116) are polychrome with multi-colored longitudinal stripes. The base color of 113 is yellow and the glass contains slightly higher concentrations of As, Pb, and Sn compared to the other bead which has a brown body. Both contain minor amounts of Cu and Zn nearly comparable to Cluster 2 beads.

DISCUSSION

The Agusan River Valley bead assemblage is composed of 34 bead types: three stone, thirty glass, and one metal. Predominant among these are opaque yellow glass doughnut beads. Lamb (1965:113) notes that "color is an important factor in our understanding of the significance of beads." The preference for certain colors may reflect a community's values – whether these are sartorial, mercantile, or societal in nature. It is thus possible to surmise that the high percentage of yellow glass beads in this assemblage could reflect a preference for this color.

A similar preference can be seen in Localities 1 and 4 at the Napa Property Site in Catanauan, Quezon (1st-2nd centuries). At both sites, opaque yellow glass beads predominate. They accompany primary adult jar burials and occur with other prestige goods such as a shell disc pendant, metal implements, obsidian, and a deer antler pendant (Basilia 2015; Luga 2013). Whether this preference is widespread throughout early Philippine communities cannot be determined at this time.

The consistent occurrence of worked and unworked gold items in Butuan and other northeastern Mindanao sites (Bolunia 2017; Burton 1977; Gamas 2020), along with the posited precolonial gold-working tradition in that region (Estrella 2016; Ronquillo 1987a), provide evidence for the importance of gold in these communities. The predominance of yellow glass beads may have been influenced by the locals' predisposition towards this precious metal.

The substitution of one material for another in ornaments is well-documented in the literature. Basilia (2011) posits that agate, carnelian, and glass beads may have inspired the application of red and yellow colorants to micro-perforated cut-shell beads. During the Ming dynasty in China, glass was used to imitate jade and white jade, which were considered valuable materials that could only be used by palace officials and the nobility (Kwan 2013).

It is possible that the yellow beads were collected from many sites and that their predominance in this assemblage is misleading. To this end, a comparative statistical analysis of glass beads recovered from other sites within the Agusan River Valley and the rest of the region will elucidate this premise.

Preliminary compositional analysis using a pXRF spectrometer on a select number of stone and glass beads revealed interesting insights into their origin and manufacture. The four stone beads do not correspond to Carter and Dussubieux's (2016) compositional data set of potential raw material sources in India, Iran, and Thailand. In particular, the Ba level of the Agusan River Valley samples is greater than those recorded in agate and carnelian beads from Cambodia and Thailand. This could indicate a different geologic source.

The available data sets for stone beads and their geologic deposits are sparse compared to similar studies on glass materials. Investigations and identifications of outcrops and quarries with evidence of historical exploitation would be helpful in determining the extent and intensity of exchange networks for semi-precious stone beads and ornaments in the precolonial period.

For the glass beads, three compositional clusters were identified based on their coloring agents. The clusters match the colorants of beads from other sites in East and Southeast Asia, including China (Steger et al. 2019), Japan (Luo et al. 2016; Ono et al. 2018), Indonesia (Dussubieux 2009; Ono et al. 2018), Malaysia (Dussubieux and Allen 2014; Ramli et al. 2017), Singapore (Dussubieux 2010), and two shipwrecks in the Philippines (Craig and Dussubieux 2022). Most of these sites fall within the presumed chronological range for the Agusan River Valley bead assemblage (10th-16th centuries) and thus illustrate the extent and intensity of the Valley communities' participation in the maritime exchange networks during this period.

There are two exceptions, however. Alacranite and orpiment as yellow colorants were detected in Japanese woodblock prints and Chinese reverse glass paintings dated between 1615 and the early 20th century (Luo et al. 2016; Steger et al. 2019). These dates are *younger* than the presumed range for the assemblage, but orpiment has long been in use in China, where it was part of the traditional painting palette and existed in large geological deposits (Gliozzo and Burgio 2022; Steger et al. 2019). As such, its use as a coloring agent appears to have long been in practice.

On the other hand, the Aru Manara site in Northern Maluku, Indonesia, presents an *older* assemblage. Blue potash-glass beads colored with manganese-bearing cobalt ores – a potentially similar colorant as in the Cluster 2 blue beads – was excavated from layers dated to 150-50 BC (Ono et al. 2018). Beads of this type were imported to Japan during the Yayoi Period (550 BC-AD 150), but their distribution waned during the Kofun period which began in AD 250 (Ono et al. 2018). These dates are significantly older than the presumed range for the assemblage and contemporaneous with the Early to Developed Philippine Metal Ages.

There are three possibilities: 1) blue potash-glass beads were still being traded to the Philippines during the Age of Contacts and Trade, 2) they represent an heirloom bead tradition (Francis 2002), or 3) were recovered from older contexts. Bolunia (2017) noted the absence of an archaeological site linking Agusan del Sur's Neolithic and Age of Contacts and Trade periods. Additionally, one of the Tabon Cave beads mentioned in Lankton, Dussubieux, and Gratuze (2006) is a dark blue potash-glass bead dated to the 1st-3rd centuries BC.

Unfortunately, the uncertain provenience of the Agusan River Valley bead assemblage prohibits a conclusive determination on these early dates. Nonetheless, the current evidence strongly suggests a connection between sites in the Agusan River Valley, Island Southeast Asia, and East Asia during the 10th-16th centuries.

CONCLUSION

Multiple levels of analysis were employed to elicit a range of useful data from the Agusan River Valley bead assemblage, a set of glass, metal, and stone beads donated by a pothunter to the ARVAHRP. Descriptive and typological analyses, following the template of Santiago (2003) and Cayron (2006), were used to identify a preference for opaque yellow doughnut-shaped beads. The consistent occurrence of worked and unworked gold materials at Agusan River Valley sites could have influenced this preference, with yellow-colored glass mimicking the appearance of gold ornaments.

The results of preliminary compositional analysis using a pXRF spectrometer suggest the participation of precolonial communities in the Agusan River Valley within a wider exchange network in Island Southeast Asia and East Asia. The selected glass beads share compositional similarities with glass samples from Indonesia (Dussubieux 2009; Ono et al. 2018), Malaysia (Dussubieux and Allen 2014; Ramli et al. 2017), and Singapore (Dussubieux 2010). The results for agate/carnelian and quartz beads are inconclusive, as they do not correspond to the published data set (Carter and Dussubieux 2016). More research is needed in this area.

A more robust and precise characterization method is needed to confirm the above suggestions, but these preliminary results are promising. "Orphaned" collections, like the Agusan River Valley bead assemblage, can be incorporated into the official archaeological corpus, albeit at a limited and preliminary level.

More research is needed to fully appreciate the significance of different bead types in precolonial communities in the Agusan River Valley, as well as the extent and intensity of bead exchange in the region. The possibility of a bead reworking – if not beadmaking – site in the region warrants a second look, particularly since compositional analysis can identify the chemical signatures of raw materials for glassmaking.

The expansion and updating of Fox and Santiago's (1985) Bead Type Collection is also needed, such as the inclusion of precise compositional data for each illustrated bead. The resulting comprehensive record will be useful in building a better chronology for Philippine beads (Cayron 2006). It may also reveal significant differences in bead preferences and utilization on a site-by-site basis (Lamb 1965), which shall ultimately be helpful in piecing together the Philippine archaeological record.

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EXPLORING LOCAL GLASSMAKING AND SOCIAL SIGNIFICANCE: GILDED GLASS BEADS IN COLONIAL MEXICO CITY

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This article centers on gilded glass beads discovered through excavations conducted by the Instituto Nacional de Antropología e Historia in Mexico City, with a particular focus on the collection from the Convent of the Incarnation. This study challenges two prevalent notions regarding these artifacts in New Spain. Firstly, the archaeological context defies the conventional belief that these beads were exclusively intended for Indigenous or African-origin populations. Evidence suggests that these items were also a component of the attire worn by Spanish women of Peninsular and Creole origin who constituted the local elite. Secondly, by combining archaeological findings with historical sources, it becomes evident that the viceroyalty fostered a specialized glassmaking industry for the production of small objects, including beads. The practice of beadmaking in New Spain commenced during the 16th century and experienced its zenith in the 18th century, characterized by the emergence of distinctive stylistic features that probably included gilded beads.

INTRODUCTION

Gilded glass beads have been found at various archaeological sites dating ca. 1600-1790 in the Americas, with a concentration in the regions of former New Spain. The decorated varieties are referred to as Seven Oaks Gilded Molded in the southeastern United States, a designation coined by Goggin (n.d.) around 1960 but no longer in favor (Francis 2009a:88-89). Their precise place of production remains uncertain, although many experts attribute them to Spanish craftsmen. Debates among specialists revolve around their manufacturing techniques, specifically whether they were molded or wound, as well as how they were decorated and gilded. Regarding their societal utilization, these beads have often been linked to Native American communities. This paper presents collections of gilded glass beads from two distinct excavation sites within Mexico City, with a special emphasis on the Convent of the Incarnation site, which boasts higher concentrations of these beads. Following an overview of gilded glass beads, this paper discusses their social context of use and explores potential manufacturing origins.

GILDED GLASS BEADS: AN OVERVIEW

The current understanding of wound, gilded glass beads remains limited. A type decorated with grooves and dots was initially named Seven Oaks Gilded Molded by John Goggin (n.d.) after the type site in Florida, but subsequent researchers have contested this label. This challenge arises from further archaeological investigations that have unveiled a broader distribution of these beads. It also challenges that the production technique was molding. Lorann Pendleton and Peter Francis (2009:5) therefore introduced the alternative term Incised Gilded, though Karlis Karklins (2023: pers. comm.) points out that the design elements are actually impressed and not cut into the glass. After an extensive examination of the decoration, Peter Francis (2009a) ruled out the use of molds and established that the designs were made by hand, using a paddle and a toothed device. Francis' analysis has also led to the proposition of the existence of small-scale communities specializing in this production (Blair 2016:106-109). However, not all gilded beads are decorated, as plain beads also exist.

The method by which they were gilded remains a subject of discussion. Initially, it was assumed that they were coated with a layer of gold leaf, but more recent analyses suggest that not all beads underwent the same gilding technique. As demonstrated by pXRF analysis conducted on beads of this type from Mound Key, St. Catherines mission, Sapelo Island, Old Mobile, and Fusihatchee, not all that glitters is gold, and some beads lack precious metals (Thompson et al. 2015).

In essence, the beads under discussion are wound, crafted from glass that displays a range of colors, from opaque yellow/white to translucent green, which is a common color in other fine ornamental Spanish glass, as noted by Goggin

(n.d.:32). They exhibit various shapes (oval, spherical, ring, rhomboid, etc.) and sizes. They can be either plain or adorned with alternating longitudinal rows of dots and parallel grooves, or only with grooves. The technique used to create the decoration remains uncertain, possibly achieved by pressing the bead with a paddle or imparted using an open-face mold or a trough mold where the bead is rolled along it while still on the mandrel. Different substances have been used to gild the beads, including bismuth, gold, iron-gold, copper-gold, and a mixture of gold, copper, and iron (Thompson et al. 2015).

As for their distribution, Incised Gilded beads have not been reported outside the Americas in archaeological contexts of the Modern Era, but are especially concentrated in the former territories of New Spain. Their presence is well-documented in the United States, particularly in La Florida (Florida and Georgia). John Goggin (n.d.:33) mentions their occurrence at the Punta Rassa site in Lee County, Florida, without specifying whether they were found in a mission context or a burial mound. He also alludes to their presence at the Bee Branch 1 (8HN17) burial mound in Glades County, the Seven Oaks site (8PI8) in Pinellas County, Lake Butler (8OR11) in Orange County, and the Cook's Ferry (8SE13) mound in Seminole County. Additionally, he mentions that the gilded beads from the Daugherty site (8HG3) could also belong to this type.

Subsequent excavations have shown that in La Florida, Incised Gilded beads are frequently found at religious missions and indigenous settlements. Notable mission examples include the O'Connell site, Leon County, Florida, which corresponds to the last of several locations of the San Pedro y San Pablo de Patale mission (1690-1704) (de Grummond 1997). On St. Catherines Island, Georgia, they have been found in the Wamassee area of the Guale village, dating back to pre-1689 (Blair 2009a:164; Smith 1983:153). Moreover, the largest concentration of gilded beads on the island was uncovered within the Franciscan mission of St. Catherine de Guale in 17th-century contexts. Within the church, the beads were discovered in funerary contexts, situated in the gospel, epistle, and mid-nave aisle areas (Blair 2009b:173). They were associated with 12 individuals, most of indeterminate sex. One exception is the burial of a woman in a coffin located on the gospel side of the church, near the altar and directly in front of the sacristy. Most individuals were young adults aged 20-30, while two were children and three were more than 30 years old. The beads also appeared in the mission courtyard, and one was recovered in the kitchen, near the convent (Blair 2009a).

Not far from this location, on Sapelo Island, the mission San José de Sapala yielded some Incised Gilded beads dating to the 18th century (Jeffries and Moore 2013:370-371; Thompson et al. 2015). Similar discoveries include those at the mission of San Luis Talimali (1633-1704) in the Apalachee Province where three beads were found near the council house (Mitchem 1993:402; Smith 1983:153), San Juan del Puerto (8DU53) (Goggin n.d.:33), and the Ortona Burial Mound mission site (8GL35) where one bead was collected by Goggin and likely dates to the early 16th-17th centuries (Jacob 1998:87-90).

Examples of indigenous sites with Incised Gilded beads include the Boynton Multiple Mounds site (8PB100) in Palm Beach County where three beads were discovered with a burial dating to 1565-1700 (Jacob 1998:105, Table 12, 117). The Philip Mound (8PO446) in Polk County, likely utilized during the late 16th and early 17th centuries, yielded five Incised Gilded specimens (Benson 1967:24), as well as four plain oblate gilded examples (Karklins 1974:5).

Incised Gilded beads have also been excavated in other states. In Rhode Island, at the Narragansett burial site in North Kingstown, a substantial quantity of such beads has been interpreted as a result of commercial connections with the Dutch during a period when the Netherlands were under Spanish jurisdiction (Turnbaugh 1984:42, cited by Francis 2009a:89). Maine also features this type of bead, at the Cushnoc trading post site (Cranmer 1990) and the Kirke family house, occupied during 1640-1696 (Gaulton 2006:221). In Alabama, at the Fusihatchee site, a Creek town, these beads are dated to the 17th century (Thompson et al. 2015).

Gilded glass beads are found in the southeastern regions of North America and in present-day Mexico, encompassing three states. In Chihuahua, examples were retrieved from the Convento site at the Casas Grandes mission (Goggin n.d.:33). Moving to the North Sierra of Oaxaca, in the indigenous village of Nejapa, the burial of a young native was accompanied by a significant quantity of gilded glass beads dating to the 17th century (King, Konwest, and Badillo 2012). In Mexico City this type of bead has been also identified in archaeological levels of the 17th-18th centuries (Martins Torres 2018, 2019:621-623).

Further south, they have been documented in Costa Rica, specifically in Puntarenas Province. At Zapotal, located on a military trade route, five gilded beads were found in association with five Nueva Cádiz beads in the funerary assemblage of an individual (Vargas Amador 2011).

Regarding their geographic distribution, gilded beads are primarily concentrated within the former territory of New Spain and are prevalent from the mid-16th century to the end of the 18th century. This pattern, however, may have been influenced by a historical bias in archaeological

endeavors in Latin America, which previously exhibited limited interest in the colonial era, especially concerning glass studies.

In terms of their origin, previous research has not definitively pinpointed the exact place of their manufacture. However, the prevailing consensus among most specialists leans toward attributing them to Spanish craftsmanship (Blair 2016:107; Francis 2009a). The exception is Rebecca Jacob (1998:172) who suggests that their origins could potentially have South American or Mexican roots.

ARCHAEOLOGICAL FINDS IN MEXICO CITY

In Mexico City, gilded beads have been identified at two distinct archaeological sites and are stored at the Archaeological Rescue Division of INAH. Specifically, in the Coyoacán neighborhood, these beads were unearthed at 62 Fernández Leal Street. They were found in the fill of an artesian well associated with the church of the Conception, along with other objects from the 16th-17th centuries. The two spherical-plain beads (CATSA 25850 1/1, CATSA 25850 2/2), corresponding to St. Catherines Type 98 (Blair 2009a:164), are made of translucent glass of undetermined color. They range from 5-6 mm in diameter and 4-5 mm in length (Figure 1, a). Additionally, a significant concentration of these beads was found at the former Convent of the Incarnation in archaeological levels that could be dated between 1639 and the late 18th century.

The Collection of the Convent of the Incarnation

Historical Context

The Convent of the Incarnation stands as a profound testament to the early establishment of the Conceptionist Order, situated in the heart of Mexico City (Figure 2). Originally, a modest monastery was erected in this vicinity by the late 16th century. The networks forged by the devoted women of the convent extended to the upper echelons of New Hispanic society, garnering support from influential public figures to provide financial backing for the convent's construction. The inaugural ceremonies took place in 1639, with the direct participation of the viceroy himself, the Marquis of Cadereyta, signifying an intimate connection to the seats of power. From then on, the institution assumed a pivotal role in the urban landscape, emerging as an emblem of prosperity, quantified by both the quantity and grandeur of its structures.

Up to the middle of the 18th century, the structure experienced substantial expansion, characterized by the successive acquisition of adjacent land parcels. Particularly intriguing are the properties formerly owned by Francisco de Oñate. In 1729, a transfer of these houses took place, with segments allocated to both the Convent and the Royal Customs House.[1] This reallocation was orchestrated with the explicit aim of facilitating the construction of distinct architectural entities for each establishment.

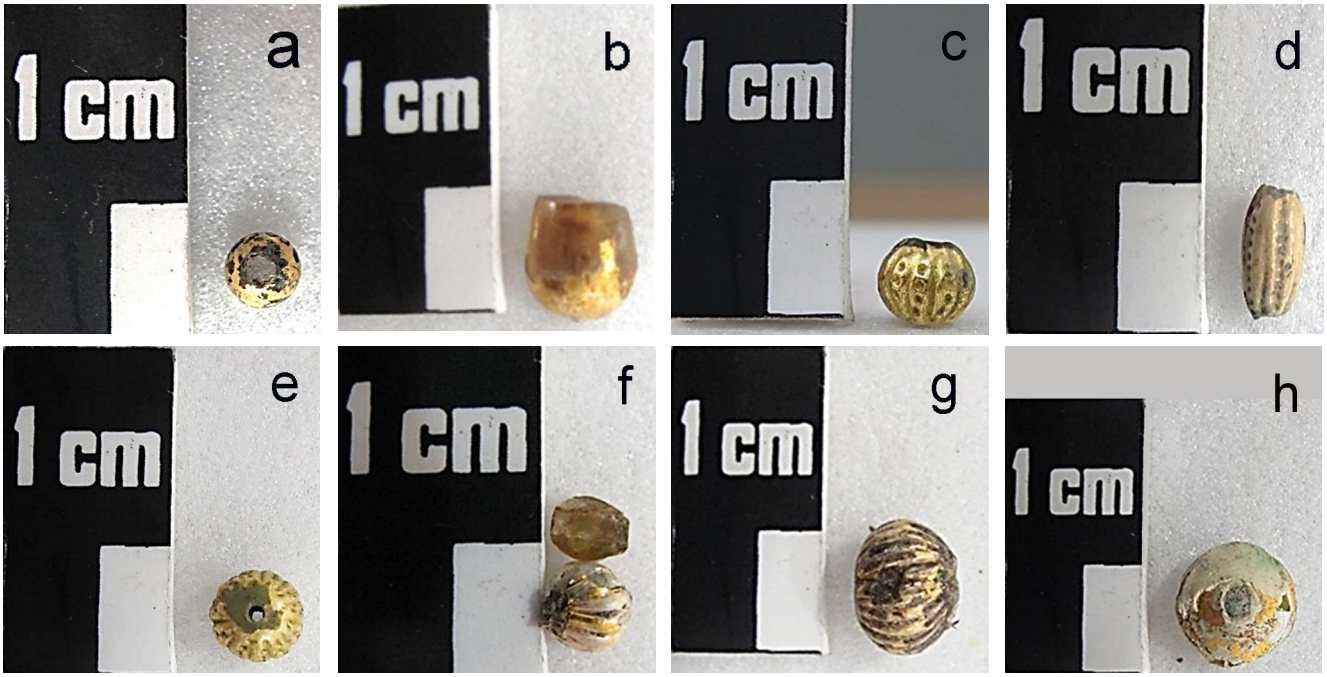

Figure 1. Gilded glass beads from Mexico City: a) spherical plain, b) oval plain, c) spherical, dot-and-groove, d-e) oval dot-and-groove, f-g) spherical grooved, h) rhomboid plain (all photos by the author unless otherwise specified).

Figure 2. Location of the Convent of the Incarnation. Detail from *Screen with Views of Mexico City*; unknown author, 2nd half of the 18th century (Franz Mayer Museum, Mexico City).

Nevertheless, between 1777 and 1779, a portion of the property had to be sold to accommodate the construction of the customs building in response to the escalating volume of trade in the city.[2] Despite spatial limitations, the convent retained a considerable size and continued to fulfill its original function until 1861, when the religious reformation plan mandated the evacuation of the premises. According to findings from on-site archaeological excavations, this transitional phase, extending until 1863, was characterized by the partitioning of specific sections, which were either sold to private individuals or repurposed for governmental use. Following the enactment of the law for the dissolution of religious orders, the building was definitively expropriated by the state, leveraging its potential as an exhibition hall, educational facilities, or lodging for financially disadvantaged students. Eventually, it was repurposed to house a library and the Ministry of Public Education (Salas Contreras 2005), signifying the culmination of its transformative journey.

The Gilded Bead Collection

Archaeological excavations led by Carlos Salas (1996, 1998) between 1989 and 1993 revealed 32 glass beads, 15 of which are gilded. These artifacts were found in two distinct contexts within the convent: a funerary setting in the church and debris from a nursery situated in the Jacaranda Courtyard, one of the former convent cloisters (Figure 3).

The initial section, known as the antechoir or *sala profundis*, is in the northern sector of the church. This room predates the choir and is accessed through an entrance adjacent to the southeast wall, with limited entry for convent residents. The underground chamber contained 86 primary burials and 31 secondary burials, one of them multiple. With the exception of four individuals (two children and two adult women), the rest were predominantly mature or elderly nuns, all of whom were laid to rest in the appropriate black habit attire (Salas Contreras 1996, 1998:147-152). This area was designated for the burial of convent residents who had succumbed to contagious diseases. Traditional burials did not take place within the private chapel of the garden, commonly used for such cases. The depth of this division and the careful isolation of burials with layers of lime minimized contagion risks, effectively isolating

Figure 3. Convent of the Incarnation indicating the *sala profundis* of the church (1) and the Jacaranda Courtyard, former cloister (2) (Google Earth).

the remains, and expediting decomposition. Despite this, significant details of their clothing were imprinted in the lime along with specific objects. Notably, individual 53 possessed two fragments of a single, oval, plain gilded glass bead without any other accompanying artifacts. This bead (CATSA 17350) has no correspondence with St. Catherines varieties. It is made of translucent glass of indeterminate color, and measures 4 mm in diameter and ca. 6 mm in length (Figure 1, b).

Unfortunately, there are limited details regarding the chronological position of this discovery. It is only noted that the burials date back to the colonial period. What we can affirm is that this burial was located in the northern section of the room, immediately adjacent to the choir. This area is where Carlos Salas (1998:144) reported the discovery of rosaries made of glass beads with gold-leaf decoration, although I was unable to locate them in the collections of the Archaeological Rescue Department. The *sala profundis* bead was uncovered within archaeological Layer 3, which corresponds to the initial grid of the *sala profundis* (C12). It is plausible that this layer corresponds to archaeological Layer 3 in the choir. In this area, Carlos Salas identified three burial layers. The first contains burials interred between 1812 and 1861, coinciding with the period between the conclusion of enhancements to the temple and the construction of the new cloister carried out by engineer Miguel Costanzó (1792-1812) and the Liberal Reform of the Church which marked the end of the use of the Convent by religious individuals. The second layer consists of material from the 18th century, while the third layer is composed of backfill containing fragments of materials associated with funeral rites, including tacks, rosaries, lace, and wood remnants. This layer is interpreted as resulting from the removal of lower deposits from the 17th century, intended to reorganize the subsurface of the choir and facilitate its continued use for more recent burials (Salas Contreras 1998:138-142). It is highly probable that this bead is from the same period, as there appears to be a seamless connection between the burials in the choir and those in the antechamber.

Most of the gilded specimens were found in the Jacaranda Courtyard, situated adjacent to the church and positioned between the residential area and the novices' courtyard. This location is next to the designated wash basin courtyard. An archaeological stratum containing various ceramic and glass artifacts was identified below the 18th-century floor in this area. Among the findings are several items associated with medical practices, including pots, plates, and bowls, some inscribed with the name "nursery." Carlos Salas (1998:82-84) interprets these objects as having stylistic elements that range from the 17th century to the latter half of the 18th century. He suggests they may have originated from a hospital or nursery dump dating to the 17th century. However, without additional information, the late 18th century should be considered as the upper limit for the 13 gilded glass beads uncovered there:

1) A spherical dot-and-groove bead (CATSA 23617 1/3), corresponding to Type 105 at St. Catherines, is made of translucent green glass and decorated with longitudinal grooves and alternating lines of dots. It is 5 mm in diameter and 6.5 mm in length (Figure 1, c).

2) An oval dot-and-groove bead (CATSA 23617 2/3), corresponding to Type 106 at St. Catherines, is made of translucent green glass and decorated like no. 1. It is 4 mm in diameter and 9 mm in length (Figure 1, d).

3) Oval dot-and-groove bead (CATSA 23617 3/3), corresponding to Type 104 at St. Catherines, is also made of translucent green glass and decorated as the previous specimens. It is 8 mm in diameter and 10 mm in length (Figure 1, e).

4) Seven spherical plain beads (CATSA 17369 1/5, CATSA 17369 2/5, CATSA 17369 3/5, CATSA 17369 4/5, CATSA 17369 5/5, CATSA 22874 1/2, CATSA 22874 2/2), corresponding to Type 98 at St. Catherines, are made of translucent green or yellow glass. They measure 5-6 mm in diameter and 4-7 mm in length (Figure 4).

5) A spherical grooved bead (CATSA 17376 1/2), Type 101 at St. Catherines, is made of translucent green glass and decorated with longitudinal grooves. It measures 6 mm in diameter and 5 mm in length. This specimen still retains part of the metal setting belonging to a strap (Figure1, f).

6) A spherical grooved bead (CATSA 17376 2/2) with no correlative at St. Catherines is made of translucent green glass and decorated with more than 15 longitudinal grooves. It is 11 mm in diameter and 8.5 mm in length (Figure 1, g).

7) A rhomboid plain bead (CATSA 23618) with no correlative at St. Catherines is a made of translucent glass of indeterminate color glass. It is 11 mm in diameter and 6 mm in length (Figure 1, h). This specimen still retains part of the metal setting belonging to a strap.

Unfortunately, compositional analysis of these beads has not been possible as yet, and accurately determining their chronology, which should range from 1639 to 1792, remains a challenge. According to assessments presented by Carlos Salas, the beads from the Jacaranda Courtyard are likely from the 17th century, aligning with the dating of the majority of previous documented gilded glass beads. Nevertheless, the specific reasoning behind this assertion remains to be clearly resolved.

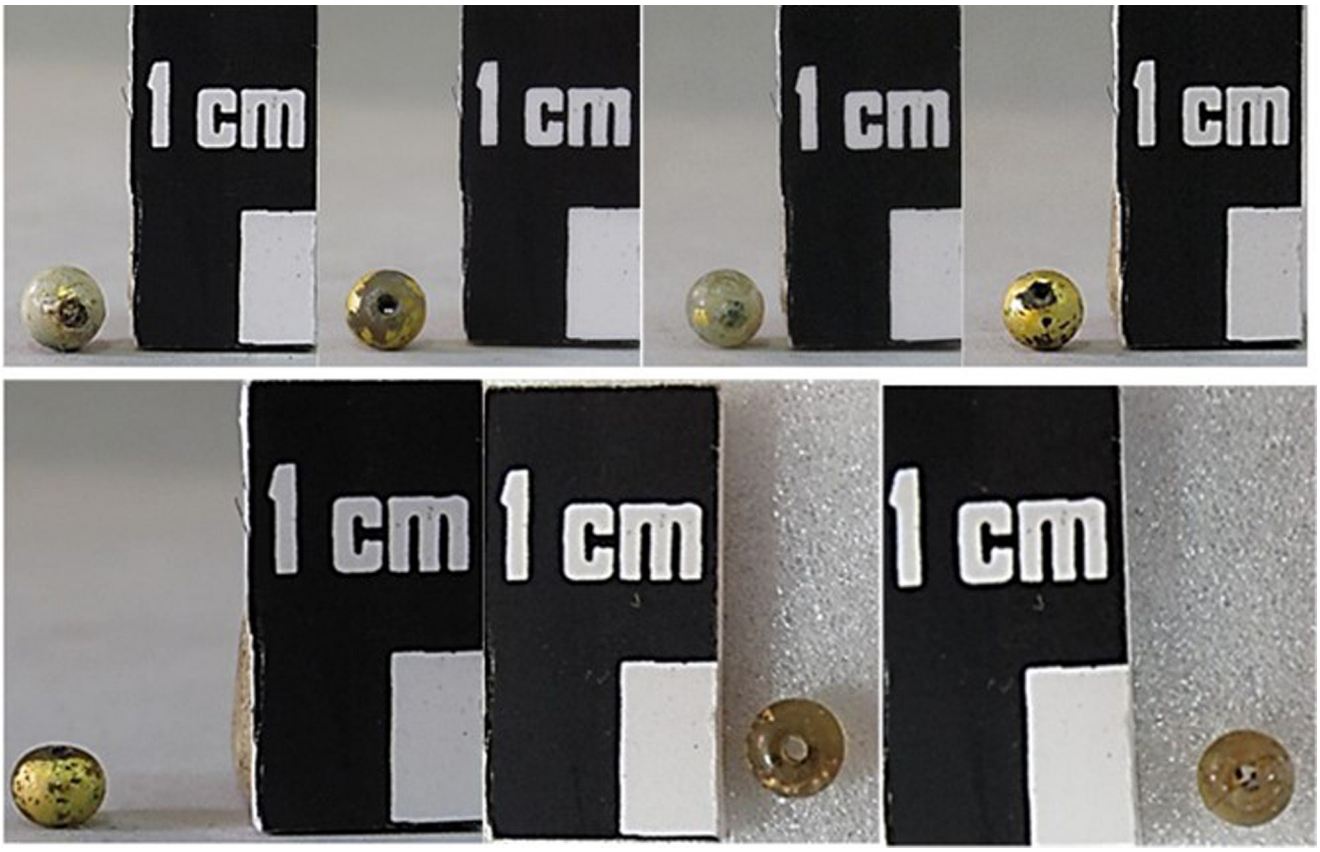

Figure 4. Spherical, plain, gilded glass beads from Mexico City.

EXPLORING POSSIBLE PLACES OF MANUFACTURE

As previously mentioned, the precise origin of gilded beads is still unknown, though most researchers suppose that they may have originated in Spain. This belief is supported by several factors. The primary argument rests on the fact that these beads are exclusively found in contexts associated with Spanish colonization and trade. This strongly suggests a connection between the production and circulation of these beads and artisans or traders within the Hispanic monarchy. However, it is important to delve deeper and clarify that this does not necessarily confirm their Peninsular or European origin.

Peter Francis (2009a:87) suggests a potential link to Andalusia, or possibly Catalonia and Castile (Blair 2016; Francis 2009b:181), where small-scale glass industries existed. Our current knowledge about glassmaking in Spain highlights the presence of significant glass factories in various cities across the provinces during the Early Modern Age, but the lampworking specialization remains relatively underexplored.

The place where unequivocal evidence for the presence of glassworking workshops has been found, and where they likely had a more significant presence, is precisely in Catalonia. The glass productions of Barcelona reached significant development and prestige in both local and international markets. However, outside of this city, the decline in importance of Catalan glass furnaces has been documented. According to Paloma Pastor (1998:12), by the 18th century, very few glassmakers still operated traditional furnaces, producing a variety of everyday glassware. Most of them worked "at the lamp," crafting beads and trinkets that were in high demand and provided greater profits. These artisans often purchased glass rods to shape with the heat of a lamp, but their suppliers remain unknown. It is uncertain whether larger workshops existed that could handle the different phases of production at scale. Josep Gudiol i Ricart (1935:90) suggests that the cylindrical beads found by Alfonso Macaya near the Church of San Pedro Pons in Corbera (Lleida) might represent traces of local manufacture. This idea is based on oral tradition which indicates the presence of an ancient glass furnace in the area, although this information has not been confirmed.

Additionally, I have recently identified the names of six lampworkers (*vidrieros del candil*) in Madrid who operated during the 17th century (Martins Torres 2021:71-75). One of them has familial connections with Barcelona and, having in mind the general guild's structure, with a tendency to keep the art within the family, passing down the knowledge from parents to children, this information hints at a potential influence of Catalan techniques on Madrid's lampworking practice.

Beyond Catalonia and Castile, the activity of lampworkers on the Iberian Peninsula remains largely unrecorded. In the absence of records identifying other specialists in regions with known significant glass production, who could have supplied them with glass rods in different colors, it is plausible to consider that this specialized craft was organized around small workshops. In the 18th century, there are well-documented attempts to establish a Royal Factory dedicated to glass bead production, which were considered a new industry at that time. However, despite the promoters being granted production privileges for six years, these efforts were not formalized.

The first initiative, led by Jacobo Schmitz, received authorization in 1770 to establish a "Factory of Beads, Trinkets, and Enamels of all kinds," in a location or locations of his convenience (Anonymous 1770:85-86).[3] The second initiative was carried out by Roque Ghiselli in 1774. He obtained permission to establish a "Factory of Beads, Glass Stones, and Crystals" in the city of San Lucas de Barrameda, a departure point for ships destined for the Americas (Anonymous 1774:81-82; Larruga 1788, I-3:191). While these endeavors could postdate the gilded beads under discussion, they underscore the fact that during the 17th century and until the end of the following century, there was no similar large-scale manufacturing in the European provinces of the Hispanic Kingdom. Instead, it is supposed that all local production occurred in workshops exclusively dedicated to lampworking tasks.

Rebecca Jacob (1998:172) proposes an alternative hypothesis, suggesting that gilded beads may not have been manufactured in Spain, but could potentially have been made in Mexico or South America. This proposition aligns with our current understanding of glass production in these regions.

In New Spain, there exists a well-established acknowledgment of a glass industry in Puebla. The earliest publications on this matter emerged precisely during the commemoration of Mexico's inaugural centennial of independence (Murillo 1922). These and investigations in subsequent years highlight the early origins of glass production in the region and underscored the exceptional nature of the Puebla case within the colonial American industrialization process (Murillo 1922). Recent works by Miguel Ángel Fernández (1990) and José Peralta Rodríguez (2013, 2018) provide valuable insights into glass production in Mexico City as well, suggesting it is likely that some of the earliest glass productions in the viceroyalty took place in Mexico (Martins Torres 2019: 232-236).

Beyond these main centers, other local initiatives have been identified (Martins Torres 2019:240-246). For instance, there are indications of production in Potosí, possibly linked to the manufacture of *cornamusas*, glass retorts used to sublimate certain metals. Curiously, these activities extended to indigenous settlements where the presence of Spaniards was prohibited. This is exemplified by the case of Benito de Espinosa, who is regarded as the first glassmaker active in the Americas, accused in 1576 of operating a glass furnace in Ameca (Jalisco).

Apart from glassworkers, extensive research in various Mexican and Spanish archives has also documented the presence of *candileros* (lampworkers) in New Spain from the 16th century onwards, with a concentration in Mexico City during the 18th century (Martins Torres 2019). Before 1618, only the names of three of these specialists are known (Table 1). The first identified lampworker in New Spain is Diego Balderas in 1561, mentioned in a document that linked him with a *dorador* (gilder) with whom he may have collaborated on enameled or gilded glass beads. A few years later, in 1595, Blas Hernández arrived in New Spain holding the title of master of lampworking. In that position he entered into an agreement to take on Ángelo Carlo as an apprentice. Carlo, a native of Genoa residing in Mexico, underwent a four-year training period, receiving 40 pesos of common gold annually, along with food and housing. The contract also stipulated that he might undertake journeys to Castile, if necessary.

This information sheds light on the processes of implementing and developing glassmaking in New Spain, involving the organization of artisans into specific branches, including lampworking. The career paths of Diego Balderas and Blas Hernández imply the informal transfer of production techniques and organizational models from various branches of glassmaking to the American colonies. This occurred independently of the legal framework that later regulated the industry through the establishment of guilds and the issuance of ordinances. By 1617, Blas Hernández's influential position allowed him to collaborate with glassmakers Francisco Prieto and Joan de Mora, to propose a regulation for the collection of *barrilla*, a key component in glassmaking.

During the 17th century, 12 lampworkers are known to have operated in Mexico City (Table 2). At least three of

Table 1. Glassworkers Identified in New Spain Until 1618 (Martins Torres 2019).

GLASSWORKERS	CASTE	ORIGIN (QUANTITY)	DESTINATION
Glassmakers	"Españoles" (Iberian Peninsula) - 20	Andalucía (2)	Puebla & Mexico
		Cataluña (1)	Mexico
		Galicia (1)	Mexico
		Extremadura (1)	?
		? (1)	Ameca (Guadalajara)
		? (1)	?
		? (1)	Ixmiquilpan (Hidalgo)
		? (12)	Mexico
	"Españoles" (from Italy)	? (2)	Mexico
	"Criollo" (Afro-American)	Veracruz (1)	Mexico
Lampworker	"Indio" (1545)	Puebla (1)	Puebla
	"Italiano" (1595)	Genova (1)	Mexico
	"Español" (1565, 1595)	? (2)	Mexico
Slave	"Negro"	? (2)	Mexico

them were involved in glass bead production: Francisco de Lara (1634), Diego García de la Gandara (1640), and Alonso Francisco Hidalgo (1640) (Martins Torres 2019). The exact appearance and techniques used in finishing and decorating their beads remain unknown. It is currently impossible to ascertain whether any of the mentioned artisans were involved in crafting gilded beads, and if so, whether they had access to gold or used alternative materials. Research conducted by Thompson et al. (2016) demonstrates that the 16th-century beads from the Mound Key site are gilded with bismuth and not gold. In contrast, the gilding materials of the 17th-century beads from St. Catherines include gold, iron-gold, copper-gold, and gold-copper-iron, while beads from Sapelo island are exclusively gilded with gold. The beads from the Old Mobile and Fusihatchee sites, dating to the late 17th and early 18th centuries, also incorporate bismuth, gold, and copper-gold, revealing the diversified nature of the gilding materials.

It is important to note that a common technique used to create a gilded appearance on glass beads in the 18th century without actual gold was described by the Creole scientist José Antonio Alzate (1785:7). He alludes to a practice of producing copper-colored glass beads for crafting rosaries intended for the natives:

> One cannot overlook a practice carried out by the "Candileros," that is to say, by the artisans who craft small glass pieces using a lamp. Those who work with glass in larger quantities in Mexico, through a well-considered practice, introduce blue color to the glass by mixing it with copper. The "Candileros" source this glass, and for crafting Rosary beads that possess the desired copper color, much sought after by the indigenous population, they subject the beads to the smoke or soot of the lamp. As a result, the copper mixed with the glass is revitalized. Indeed, any person not acquainted with true Chemistry would judge these beads to be made of copper. What does this prove? The revitalization of copper, through the influence of phlogiston in the fat. To this, add what was previously discussed about the revitalization of silver. The certainty remains that even the most skilled Mercury-User [referring to an alchemist] given copper metal will undoubtedly not be able to obtain even the smallest portion of copper metal. Let us apply this same principle to minerals or silver metals (translated and adapted by the author).[4]

This information is particularly interesting in light of the new data provided by pXRF analysis, which indicates the presence of copper-gold and gold-copper-iron gilded beads (Thompson et al. 2015).

Table 2. Lampworkers in Mexico City from 1618 to 1680, Highlighting the Three Bead Producers (Martins Torres 2019).

NAME	CASTE	DATES OF OPERATION
Pedro de Cárdenas	"Español"	1629-1640
Francisco de Lara	"Español"	1629
Riviera	?	1633-1640
Francisco Bezerra	?	1634
José de León	"Español"	1636
Diego García de la Gándara	?	1640
Alonso Franco Hidalgo	"Español"	1640
Juan de Espinosa	?	1640
Diego de Ruceta	?	1640
Diego Becerra	?	1642
Francisco de la Vega	?	1672
Tomas de León	?	1672
Francisco de Ugarte	?	1672
Agustín Baptista	?	1672
Antonio de Espinosa	?	1674
Francisco Duran	?	1680

Outside of New Spain, several papers highlight glassmaking at Ica, Peru (Ramos 1984, 1989; Soldi 2005), and Cochabamba, Bolivia (Morales 1978), but its significance within the Hispanic monarchy's glass industry had not gained much attention. Additionally, recent archival investigations have also identified glassmaking in Lima (Peru), Guambacho (Peru), Arica (Chile), Córdoba (Argentina), and intents to produce glass in the Jesuitic missions of Paraguay (Martins Torres 2019). However, there is no evidence of lampworking in these places.

THE SOCIAL CONTEXT OF BEAD FASHION

The first point of consideration revolves around the perception of glass beads as "Indian artifacts" in America since the colonial era. The chronicles of the Indies contain various accounts that illustrate how, in the early stages of Spanish presence, the extensive use of glass beads was closely linked to the practice of gift giving. For instance, in Bernal Díaz del Castillo's *True History of the Conquest of New Spain*, published in 1576, he recounts various episodes in which they were utilized. On one specific occasion, they were employed to prevent conflicts:

> ... when the indigenous people arrived with the ten canoes near our ships, responding to the peace signals we made and beckoning them with our hands, waving for them to come and speak to us, ...without any fear they came and boarded the flagship, over thirty of them, and we gave each of them a string of green beads... (translated and adapted by the author).[5]

The same author points out other instances where this was not feasible, and the act of gift giving was subsequently employed to satisfy the defeated and maintain peace over time:

> And to those two indigenous messengers, green beads and blue diamonds were given, and Aguilar spoke many sweet and flattering words to them, stating that we wanted to consider them as brothers, that they should not fear, and that the past war was their fault. He instructed them to call all the chieftains from different villages, as we wanted to converse with them. Many other things were gently advised to attract them to peace... (translated and adapted by the author).[6]

Beads also served as a form of currency for the ransom of captives. Bernal Díaz del Castillo dedicates a few lines to describe the history of Jerónimo de Aguilar and Gonzalo Guerrero, the only survivors of a shipwreck who lived for some time at Maya communities in the Yucatán. The author recounts how Hernán Cortés, upon receiving news of Spaniards near Cozumel, sent traders to deliver gifts and a letter requesting they join his group. Apparently, among the gifts were glass beads which Jerónimo de Aguilar used to pay for the use of a canoe and the services of rowers to meet the Spaniards:

> When the Spanish man who was in the custody of the Indigenous people received certain news that we had returned to Cozumel with the ships, he rejoiced greatly and thanked God. He hurried to come, along with the two Indigenous individuals who had carried the letters and the ransom, to embark in a canoe. And since he paid well with green bead ransoms that we sent, he found it rented out immediately, with six Indigenous rowers aboard (translated and adapted by the author).[7]

Simultaneously, beads were used to acquire various products, embodying the principle of barter prevalent between the natives. One of the most significant effects of these transactions was obtaining sustenance, as well as valuable objects such as gold. This is connected to the perception that the Spaniards deceived the local populations, convincing them to trade their gold for worthless trinkets.

> ... while we were preparing our ship, many indigenous people from the town of Tonalá, located a league away, came to us. As a gesture of peace, they brought maize bread, fish, and fruit, which they willingly offered to us. The captain bestowed them with many compliments and presented them with green beads and diamonds. He communicated through gestures that they should bring gold for trade, promising to provide them with items in exchange for our ransoms. They had hidden gold jewelry beneath, and they received beads in return for it. People from Coatzacoalcos and other nearby villages also came, bringing their own jewelry (translated by the author).[8]

Although the cited texts transport us to the initial years of European presence in America, this idea persisted throughout the entire viceregal period. It is evident in the expectations expressed through the distribution of glass beads to presidios and missions in New Spain during the 17th and 18th centuries, specifically intended for the local inhabitants. For instance, in 1692, Governor Don Domingo de Theran de los Ríos dispatched a shipment of beads to the San Francisco de Texas and Real de Santa Margarita de Buenavista missions, enabling Captain Gregorio de Salinas Varona to offer them as gifts to the native communities he faced.[9] Furthermore, as early as the 19th century, between 1806 and 1809, the Franciscan fathers overseeing the missions in Alta California requested various colors of glass beads as part of their supplies.[10]

This concept is also conveyed through iconography originating in New Spain and circulated throughout Europe, contributing to the dissemination of that image on both sides of the Atlantic. For instance, an engraving featured in the French edition of Antonio de Solis' *History of the Conquest of Mexico*, published in 1691 (Figure 5), and a painting depicting "natives of distant communities" from a series of *casta* paintings by Miguel Cabrera, created in 1763 (Figure 6), provide concrete examples. These visual representations not only display their bodies adorned with feathers and beadwork but also serve as a manifestation of the establishment of indigenous uniqueness from the European perspective. The incorporation of such material elements in the cultural depictions of the most isolated individuals within the viceroyalty reinforced the perception of native populations as exotic and distinct, further perpetuating the concept of their "otherness" in the domination context. This artistic portrayal becomes a tangible reflection of the cultural and social dynamics during that time, emphasizing the European concept of the native populations of the Americas.

Figure 5. Indigenous people illustrated in the *History of the Conquest of Mexico* (Antonio de Solís 1691; Bibliothèque pnationale de France, ark:/12148/btv1b23000099).

Figure 6. *Indios Gentiles*, Miguel Cabrera, 1763 (Museum of the Americas, Madrid).

Curiously, these objects are present in the collections of national museums in Spain, encompassing historical-ethnographic items spanning the Modern Era to the present (Martins Torres 2021), with only a few objects dating back to 1700. Primarily comprising rosaries and necklaces from the period between 1650 and 1750, various anthropologists (Cavero and Alonso 2002) and art historians (Herradón 2005; Piñel Sánchez 1998) have interpreted these pieces as examples of popular jewelry used in rural environments. This stands in contrast to the notion of refined and courtly jewels more commonly associated with higher social groups living in the urban areas. In some cases, they have been linked to non-canonical forms of Catholic religion and the warding off of specific types of illness. In a way, they were ideologically associated with the construction of an "otherness" in European geography that drew parallels between the lower strata of the population on both sides of the Atlantic. However, the use of glass in adornment accessories was not limited to the lower strata of the population of the Iberian Peninsula. From the late 17th century onwards, there was a growing fondness for cut-glass jewelry among the ladies of the court. This went against successive decrees aimed at prohibiting the use of imitation gemstones. This practice was still uncommon in Europe and drew admiration from outsiders, such as the Frenchwoman Marie Catherine D'Aulnoy, who visited Spain in 1679 and was surprised by the fact that:

> ... they are charmed by fake stones; despite having so many fine and beautiful ones, they don't refrain from wearing the bad ones, which are nothing more than roughly carved glass pieces, completely similar to the ones peddlers sell to our countrywomen... (translated by the author).[11]

Her words carry a dismissive judgment that is detached from the socio-cultural context she observed and clearly indicate that this trend did not emerge in Spain as a more economical option at the end of the 17th century. Those who wore glass adornments weren't lacking the means to acquire other jewelry made from precious materials; instead, they used them as an alternative. This also suggests that artistic quality was not solely tied to material value, but rather the highly regarded technical skill of lapidaries (who worked with gemstones and glass) or jewelers (who, unlike goldsmiths, were restricted from selling precious materials and engaged in trade with glass beads, among other items), as well as its aesthetic impact.

This information challenges the prevailing belief that glass adornments were solely associated with individuals from lower socioeconomic backgrounds in Europe, but also in the Americas. In New Spain, both Peninsular and Creole elites strove to imitate European fashion trends, albeit with adaptations tailored to local sensibilities. As a result, a plethora of courtly attire, liturgical textiles, and household linens decorated with beadwork provide insights into the manifold social strata that glass beads traversed. Their circulation extended beyond the boundaries of subordinated people and encompassed individuals from native groups and people of African descent.

The ideas expressed so far demonstrate that the use of glass beads throughout the colonial period was quite widespread among the entire population, regardless of their economic capacity or social status. This prompts us to weigh the likelihood that certain glass beads unearthed in diverse archaeological settings in New Spain may not necessarily have belonged to individuals of modest financial means or from social backgrounds of Native American or African-American origin. Building upon this foundation, significant avenues of research are designed to be explored concerning the gilded glass beads from the Convent of the Incarnation. Notably, whether disparities existed in the types of beads favored by distinct social collectives, potentially linked to their preferences, purchasing power, access to production centers, distribution and sales networks, or even other forms of symbolic considerations.

Regarding the socio-economic context, it is important to emphasize that although the convent aimed to gather nuns from the elite of New Spain, not all were considered equal. Their status was determined by their ability to pay the dowry, which was among the highest in New Spain at that time.[12] The convent also accommodated secular women, both free and enslaved, who provided their services to that institution or even to a particular resident.[13] Their lives were shaped by the architecture of the building and the rules set by the Conceptionist Order. These factors, coupled with each individual's status within the institution, determined the spaces they could circulate in and even influenced the appearance of their bodies.

In the church, a single example of an oval, plain gilded glass bead was found in a funerary context in the antechoir. This area was reserved for the elite members of the convent population, particularly those who suffered from contagious illnesses. The customary funerary practice for these nuns in black habits, which culminate their religious profession, involved dressing them in garments worn during the ceremony of their vows. Archaeological records indicate that this attire included a habit, apron, cap, and veil. Notably, the veil of the burial features intricate lace remnants made from copper and maguey fibers, reflecting the solemnity of the occasion (Salas Contreras 2005). Fragments of a crown and a branch near the arm were also unearthed. Crafted from metal wire, some coated with silver, these complements were adorned with flowers, whether natural or made of paper. Additionally, a medallion or shield often graced the chest, with one instance revealing beadwork impressions in a plaster fragment, suggesting that the shield had been bead-embroidered. Furthermore, a bead rosary was frequently draped over the left shoulder.

While the only depictions of the nuns from the Convent of the Incarnation in their final moments (Figure 7) suggest that some rosaries used towards the end of the 18th century featured gilded beads, older portraits from other convents depict nuns wearing beads similar to the oval plain gilded glass bead found in the church (Figure 8). This resemblance, along with the deposition context, strongly indicates that the bead with the burial may have been part of a rosary belonging to a nun in a black habit, signifying her high status within New Hispanic society.

The significant concentration of these materials in a debris area abundant with nursery-related items leads to the hypothesis that the beads likely played a role in contexts connected to illness and healing rituals. They could have been incorporated into rosaries or amulets used by nuns, their attendants, or individuals who frequented the convent, to beseech divine intervention for healing or to commend the soul as death approached.

Concerning amulets, it is worth noting that their use was not entirely condemned by the Church, and in some instances, they are associated with divine imagery or medicine. On the other hand, while apparent orthodoxy prevailed within the convent, the influence of Indigenous women from various American ethnicities and African and Asian backgrounds might have led to behaviors considered divergent and cultural exchanges between these groups, similar to occurrences outside the convent. Hence, it is not difficult to imagine that women continued to utilize their protective objects or traditional remedies, and that some nuns sought out formulas from other women to heal the body or satisfy their ambitions. All these circumstances make it difficult to define the social profile of the user of these beads. There is compelling evidence suggesting that religious women from the upper echelons of Creole society occasionally used these beads. However, it is also important to consider the possibility that they were employed by other individuals. This becomes particularly pertinent if future research reveals that the gilded beads had a higher price compared to other glass beads. This argument has been used to suggest that the glass beads gilded with gold, of higher value, were initially intended for the use of the ecclesiastics and that, when they broke, they may have been repurposed by Indigenous people at North American missions (Francis

Figure 7. Portrait of Prudencia, a professed nun of the Convent of the Incarnation in Mexico, deceased in 1781. Copy made by Andrés Lopez in 1872 (New York State Office of Parks, Recreation and Historic Preservation).

Figure 8. "Sister Elvira of Saint Joseph, Religious of Santa Ines, twice Prioress. Died on 6 May 1711, aged 74 years, 4 months, and 4 days, and a nun for 5 months and 18 days" (Museo Nacional del Virreinato, http://mediateca.inah.gob.mx/repositorio/islandora/object/pintura%3A2586).

2009a: 88). However, as previously demonstrated (Martins Torres 2016:115), even those from the lower ranks of New Hispanic society substantially invested in acquiring jewelry with significant symbolic value and a high cost. Thus, this argument inherently lacks sufficiency as a criterion.

In the mentioned circumstances, the relationship between this small consumer community and its preference for gilded beads, along with the community of artisans producing them, should be investigated. This exploration could shed light on potential social connections as well as shared economic and political interests associated with beadmaking and trade. The consumption of glass beads made in New Spain by members of the Spanish elite with strong roots in the land could have served as a distinctive marker through which they could differentiate themselves from recently arrived Peninsular Spaniards. In doing so, they would also be demonstrating their support for the development of local industries and the colonial economy. This trend would become more pronounced from the mid-18th century onward with the emergence of a discourse on Creole identity, which laid the foundation for 19th-century independence movements.

CONCLUSION

The presented data allow us to assert that the gilded glass beads were used by Creole women in New Spain, as well as by individuals from original ethnic groups, mainly during the 17th century and probably also during the following century. Their production most likely took place within the New Hispanic context, where several lampworkers operated, particularly in Mexico City. These workshops would have been small establishments where the craft was passed down from parents to children or where apprenticeship contracts were established to facilitate the learning of the specialty.

Generally, glassworker guilds excluded the participation of women, although widows were permitted to assume their late husbands' positions without examination, indicating their possession of the necessary knowledge to carry out the tasks. Similarly, regulations excluded castes (including natives, Africans, and Afro-Americans) from the higher echelons of the guild hierarchy to favor Spanish control of the sector. However, it has been proven that this was not always the case. It is conceivable that certain workshops combined lampworking tasks with the production of glass rods, as some artisans held the title of glassworker as well. It is also possible that a division of labor existed within these smaller workshops with the gilding being performed by a person other than the one who created and decorated the bead. The insights provided by Alzate's data indicate the existence of various lampworking workshops producing gilded beads in the 18th century. All these workshops formed a small community from which a new type of bead emerged at that time and place. Their use by the highest social strata of the Convent of the Incarnation indicates that the nuns supported this local manufacture through their consumption practices and taste preferences

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ENDNOTES

1. Archivo General de la Nación [AGN], México, Bienes Naciones, vol. 18, exp. 8, 1729.

2. AGN, Tierras, container 946, vol. 2238, exp. 7, 1777-1778; AGN, Obras Públicas, container 17, vol. 41, exp. 1, 1778; AGN, Reales Decretos Originales, vol. 116, exp. 228, 1779.

3. Archivo Histórico Nacional, Spain, Consejos, Book 1521, Nº 25, 1770.

4. "No se puede dejar pasar en silencio una práctica acostumbrada por los Candileros, quiero decir, por los Artesanos que fabrican por medio del candil pequeñas piezas de vidrio: Los que trabajan vidrios por mayor en México por una práctica muy bien pensada, dán color azul al vidrio por mezcla de cobre; los Candileros se surten de él; y para construir cuentas de Rosarios, que tengan el color de cobre, color muy apetecido por los Indios, después de fabricadas las cuentas, las exponen al humo ú ollín del candil; entonces el cobre mezclado al vidrio se revivifica; y es cierto que qualesquiera persona que ignore la verdadera Química, juzgará aquellas cuentas por de cobre: ¿qué prueba esto? La revivificación del cobre, en virtud del flogistico de la grasa: añadase esto á lo expuesto sobre la revivificación de la plata; lo seguro es, que si al mas hábil Azoguero se le entrega el metal de cobre, seguro es no conseguirá la mas pequeña porción de metal de cobre: apliquemos esto mismo respecto á los minerales ó metales de plata" (Alzate 1785:7).

5. "... llegados los yndios con las diez canoas çerca de n[uest]ros nauios, con señas de pas que les hizimos y llamandoles con las manos y capeando para q[ue] nos viniesen a hablar, ... sin temor ninguno vinieron y entraron en la nao capitana sobre treynta dellos y les dimos a casa vno vn sartalejo de quentas verdes ..." (Díaz del Castillo 1904 I-2:11).

6. "E aquellos dos yndios mensageros se les dio cuentas verdes E diamantes azules, y les dixo Aguilar muchas palabras bien sabrosas y de alagos, y que les q[ue] remos tener por hermanos, y que no oviesen miedo, y que lo pasado de aquella guerra q[ue] Ellos tenian la culpa, y que llamasen a todos los Caçiques de todos los pueblos q[ue] les queremos hablar y se les amonesto otras muchas Cosas bien mansamente para atraellos de paz" (Díaz del Castillo 1904 I-35:95).

7. "Quando tuvo notiçia çierta El español questava En poder de yndios que aviamos buelto A coçumel Con los navios, se alegro En grande manera y dio graçias a dios y mucha priesa En se venir El y los dos yndios que llevaron las cartas y rrescate A se embarcar En vna canoa, y como la pago bien En quentas verdes del rrescate que le enbiamos, luego la hallo alquilada con seys yndios rremeros con ella" (Díaz del Castillo 1904 I-28:78).

8. "... y estando adereçando n[uest]ro nauio vinieron muchos yndios del pueblo de tonala, questa vna legua de alli y muy de paz truxeron pan de maiz, y pescado, y fruta, y con buena voluntad nos lo dieron, y el capitan les hizo muchos alagos y les mando dar quentas verdes y diamantes y les dixo por señas que truxesen oro a rrescatar y que les daria de n[uest]ro rrescate, y trayan joyas de oro baxo, y les dauan quentas por Ello y tanbien vinieron los de guaçacalco y de otros pueblos comarcanos y truxeron sus joyezuelos" (Díaz del Castillo 1904 I-16:46).

9. Biblioteca Nacional de México, Manuscritos, Nº Sistema 000604373, "Recibo por armas, pólvora, ropa, avalorios y otros géneros entregados a las misiones" (Receipt for weapons, gunpowder, clothing, glass beads, and other goods delivered to the missions), f. 187v-188r.

10. AGN, Archivo Histórico de Hacienda, vol. 283, exp. 23. AGN, Archivo Histórico de Hacienda, vol. 283, exp. 45.

11. "... las piedras falsas les encantan; ellas, que poseen tantas finas y que son tan bellas, no dejan de llevar otras malas, que no son más que pedazos de vidrio labrados toscamente, enteramente semejantes a los que los vendedores ambulantes venden a nuestras provincianas ..." (D'Aulnoy 1986:346).

12. According to historical records, since the late 17th and early 18th centuries, it cost 3,000 pesos (AGN, Bienes Nacionales, vol. 128, exp. 37, 1691).

13. In 1663, the nun Ana de San José Neli requested a servant due to being ill (AGN, Indiferente Virreinal, vol. 2885, exp. 7, 1663), and in 1600, the abbess

Luisa de Encarnación requested six free indigenous or mulatta women on behalf of the congregation (AGN, Bienes Nacionales, vol. 78, exp. 39, 1600).

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BEAD COLOR SYMBOLISM AND COLONIALISM IN THE MOHAWK VALLEY DURING THE LATE 17TH CENTURY

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Scholarship has long recognized the significance of glass beads in post-Columbian North America. For Northeastern Native Americans, beads were relationally entangled within sociopolitical relationships and the spiritual world. In the Mohawk Valley of eastern New York state, bead types and colors have been useful temporal markers, but their social and spiritual significance has received less attention. This paper seeks to address the metaphysical significance of glass beads from the Veeder (Fda-2) site, a late 17th-century Mohawk village in eastern New York state. Through the interpretation of color symbolism, the Veeder bead assemblage can be contextualized alongside multi-scalar phenomena such as colonialism, disease, warfare, and the large-scale emigration of Catholic Mohawks. Indeed, the selection of specific bead colors can shed light on the villages' inhabitants state of being and provide a way to further understand the intersection of colonialism and Native American interactions.

INTRODUCTION

Beads of varying materials have been significant throughout both the pre-Columbian and the historic periods as items of production, exchange, adornment, and ritualistic practices. As Blair, Pendleton, and Francis (2009:2) note, "Beads reflect behaviors that influenced people's lives: the economic, the technological, the social, and the ideational." Regarding historic glass beads, archaeological research in North America has focused on answering questions of provenience, manufacturing techniques, and exchange networks, due to the wide geographic distribution of beads and their deep temporality, as well as their entanglement in both political and spiritual spheres (Hamell 1992; Kidd and Kidd 1970; Turgeon 2004:20). Perhaps the most prominent focus of bead research in North America has centered on refining bead typologies and diachronic trends in manufacturing techniques. This long history of research has identified significant changes in bead size, shape, color, and manufacturing techniques, making them sensitive temporal markers and ideal for the seriation of archaeological sites (e.g., Bradley 1983; Fitzgerald 1983; Kent 1983; Kenyon and Fitzgerald 1986; Kenyon and Kenyon 1983; Little 2010; Marcoux 2012; Moreau 1997; Smith 1983). More recently, bead research has incorporated archaeometric methods to address place of manufacture and date, while others have investigated their intersection with ritual, identity, and colonial relationships (e.g., Blair 2015, 2017; Dussubieux and Karklins 2016; Panich 2014; Ross 1997; Turgeon 2004).

In the Mohawk Valley of eastern New York state, historic glass bead types and colors have been used as diachronic markers, yet the reasons for these preferences are not well understood. This article takes a nuanced approach to bead research by historically situating diachronic changes in glass bead color in the Mohawk Valley alongside colonial entanglements that included conflict, population decline, and religious influence. I draw on archaeological research and ethnohistoric accounts of Mohawk (and Haudenosaunee [Iroquois] more broadly) spirituality and color symbolism to contextualize these shifts in the middle to late 17th century. I argue that the Mohawk demonstrated a high degree of agency in their selection of particular beads to reflect the spiritual state of the communities due to broad historic events occurring in Iroquoia and the Northeast. Specifically, I suggest the consumption of black glass beads at the Veeder site (commonly referred to as Caughnawaga; ca. 1679-1693) was an active representation of mourning as a result of depopulation of the Mohawk people following the emigration of Catholic Mohawks to Quebec, as well as conflict with the French and long-term disease-driven population decline. Through this analysis it is possible to link colonial entanglements with the consumption of black glass beads by the Veeder inhabitants.

HAUDENOSAUNEE SPIRITUALITY, COLOR SYMBOLISM, AND ADORNMENT

For the Haudenosaunee, the spiritual world was entwined with and affected all aspects of life (Brandão

1997:2). The Haudenosaunee origin story offers insights into their beliefs and how they understood their physical, social, and spiritual worlds. The story reveals essential characteristics of Haudenosaunee gender roles, clan structure, and political organization. Sky Woman, the central character, represents the role of Haudenosaunee women as the source of life, sustenance, and mother to men who shaped the physical world (Snow 2008:5). Her twin sons, Sapling and Flint, represent family living arrangements and village and tribal moiety division, as well as the opposition of good and evil (Snow 2008:5). The various spiritual ideas discussed in the origin story were enacted through ritualistic ceremonies and imbued and connected tangible materials with ideological beliefs. This notion is evident in the multitude of ceremonies performed, such as the Green Corn, Maple, and Berry festivals (Morgan 1962). Additionally, directionality, such as the cardinal directions and clockwise or counterclockwise movement, was imbued with meaning and was embedded throughout Haudenosaunee practices (Hamell 1983:6). Furthermore, community movement and village relocation were not only a result of the exhaustion of subsistence materials, but may also have been affected by a sense of spiritual pollution (Engelbrecht 2003:104). According to various scholars (Engelbrecht 2003:104; Hamell 1987; Herrick 1995:67), the Haudenosaunee believed that if an ancestor was neglected or offended, their animate ghost could cause "ghost sickness" or illnesses and other problems for the living. For example, illness may have been caused by an imbalance in the spiritual world, one's family, clan, or community, or one's body and spirit (Engelbrecht 2003:47-48).

Indeed, almost all objects, natural or human-made, had the potential to contain spiritual power or have a connection to the spirit world. Colors and objects, often inseparably linked, were believed to embody specific spiritual meanings and powers (Hamell 1992; Miller and Hamell 1986:323). The connection between the body, adornment, and color was actively expressed through tattoos, clothing, and ornaments. Johannes Megapolensis, a Dutch pastor in New Netherland, noted that the Mohawk strung wampum into belts that were worn around the neck or body. Individual strands formed earrings (Snow et al. 1996:44). However, according to Snow (2008:92), trade with the Dutch changed the clothing of the Mohawk, who no longer depended on deer, substituting cloth for hides. Furthermore, as broadcloths replaced deer hides, glass beads and silver brooches began to replace shell beads (Snow 2008:92). Men's leggings, breechcloths, shirts, and moccasins were originally decorated with dyed quills and moose hair, later with beads and other trade goods (Snow 2008:92). Women wore leggings from the knees down, long skirts, and long overblouses which were also adorned. Men painted their faces: blue connoted health and well-being, black represented the imbalance of war or mourning, while red signaled life or violent death (Snow 2008:93). Considering the intertwined spiritual and physical worlds of the Mohawk, adornments could have been used to represent and express the spiritual state of both the individual and the group. The material and, importantly, the color of adornments could have been used to signal a specific spiritual state.

THE IMPORTANCE OF COLOR

For the Haudenosaunee, ritualistic and spiritually significant objects had a specific symbolic association that was conveyed by the object's color (Miller and Hamell 1986:323). Drawing on the linguistic research of Berlin and Kay (1969), Miller and Hamell (1986) argue that Iroquoian groups divided basic color conceptions and their subsequent symbolic links into three categories: white, black, and red. George Hamell, who has conducted the most research on color symbolism of Northeastern Indigenous groups, describes the three colors as representing the "states-of-being" of its participants. According to Hamell (1992:456), "color is a semantically organizing principle of ritual states-of-being and of ritual material culture," meaning that white, black, and red, as well as combinations of these colors, represented specific physical and spiritual states of individuals and groups. To the Haudenosaunee, different, but related hues of each of the three basic colors were associated with the same symbolic meanings as one of the main colors. Hues ranging from sky blue to white and nearly white were interchangeable in most spiritual and ritual contexts (Hamell 1992:460; Miller and Hamell 1986:324). The same interchangeable conception was true for black and red; dark colors such as dark blues and purples, as well as different but bright hues of red, embodied the same meaning as their black and red counterparts.

Ritual was used to maintain one state of being or transform it into another, at least temporarily (Hamell 1992:456). For the Haudenosaunee, white, black, and red organized ritual into three contrastive and complementary spiritual states: social, asocial, and anti-social (Hamell 1992:456). Although the Haudenosaunee categorized colors into three main groups, others, such as yellow, may also have had spiritual significance. White, blue, bright or reflective substances, and sources of light were the most potent, all connoting the same symbolic meaning, such as life, knowledge, harmony, and positive states of physical, social, and spiritual well-being (Hamell 1983, 1992; Turgeon 2004:34).

Red connoted the animate aspects of life and was symbolically linked to fire and the animate (blood) and

the emotive states of life, as well as the antisocial and war (Hamell 1992). According to Turgeon (2004:34), "red was the colour of antisocial states-of-being, animacy and war, although it could have positive connotations, if consecrated to socially constructive purposes, or negative ones if consecrated to socially destructive functions." Blood, certain pigments, stones, native copper, berries, fruit, red willows, and red cedars were imbued with the symbolic and inherent qualities of red (Hamell 1992).

Black, dark blues, and indigo represented the converse of all symbolic meanings of whiteness and was associated with the absence of light, well-being, harmony, and the purposiveness of mind and knowledge (Hamell 1992). Additionally, it connoted the absence of animacy, as well as death and mourning (Hamell 1992). Turgeon (2004:34) succinctly described the symbolic meaning as "black expressed asocial state-of-being, negative aspects of life and, ultimately, death."

BEAD RESEARCH IN THE MOHAWK VALLEY

In the Mohawk Valley, glass beads have predominantly served as temporal markers. Although the manufacture, shipment, or trade dates of the beads have not been fully researched, Donald Rumrill (1991) has conducted the most extensive work on the subject. Using artifacts such as kaolin pipes, firearm components, and Jesuit rings to date archaeological sites, he used these relative dates to establish a chronological sequence for glass beads in the region (Figure 1). Rumrill (1991:5) validated his chronology by finding congruence between his dates and those obtained by Dean Snow (1995) through AMS dating of various materials. Rumrill has attributed beads in the Mohawk Valley to 12 phases; the first starting in 1560 and the last ending in 1785. While Rumrill's phases are largely chronologically accurate, his designations are categorized by either manufacturing technique, color, or general time period (e.g., Black Seed Bead Period, Blue Bead Period, and Early Historic Period). This approach is useful in tracking diachronic trends, but is not conducive for contextualizing the consumption of glass beads by Mohawk communities. If color was the defining attribute in bead choice for the Mohawk, bead shape or manufacturing technique are less useful for understanding changes in bead frequency and historically contextualizing Mohawk agency in bead selection (Hamell 1992:459).

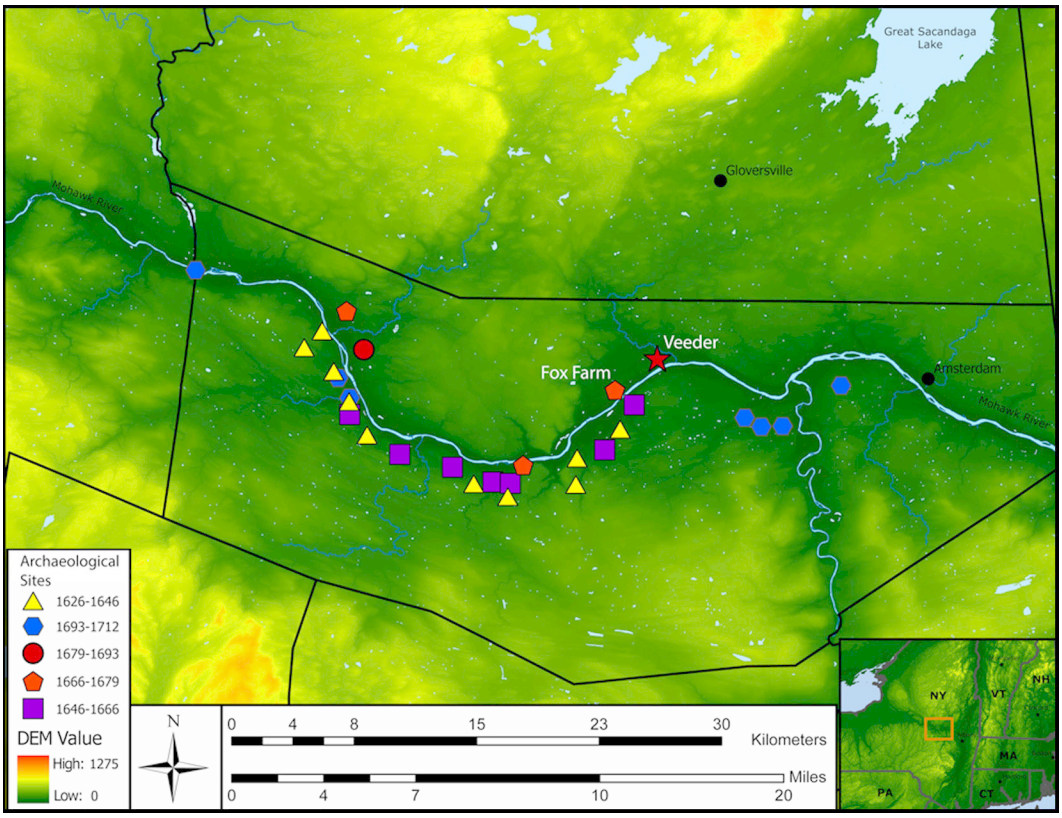

Figure 1. Location of Mohawk sites by temporal period, Montgomery County, New York (all images by author).

RECATEGORIZING BY COLOR

As previously stated, Rumrill's bead chronology is the only comprehensive analysis of beads for the Mohawk Valley. Due to a lack of time and the unavailability of many of the collections used by Rumrill, his chronology and analysis of bead assemblages is employed here. To better understand bead colors in the region, I recategorized the horizons defined by Rumrill (1991) by the three colors recognized by the Mohawk (black, white/blue, and red), as well as a few colors that fall outside this main color scheme (Table 1). The bead horizons were chosen to test if there was in fact no color preference during particular phases and to contextualize the Veeder site bead assemblage and the 1679-1693 period. I applied the same process to Douglas Clark's (2019) analysis of Oneida bead assemblages. Six temporal periods were chosen, spanning 1635-1725, to establish a comparative dataset (Table 2). Although this process is somewhat subjective, it is necessary to understand the decisions of the consumers (i.e., Mohawk and Oneida) and not the European distributors.

Generally, there appears to be a preference for white/blue beads during the early 17th century, though there was a significant shift to red beads between 1667-1682 (Figure 2). The timing of this change corresponds with an increase in hostilities between the Mohawk and the French and the re-introduction of Catholic missions and Jesuits in Mohawk villages. The red bead period abruptly ends ca. 1679 when hostilities between the French and Mohawks erupt once again. It also corresponds with the expulsion of Catholic Jesuits from Mohawk villages and a significant emigration of Catholic Mohawk converts to Quebec. These shifts are different than those observed among the Oneida, who preferred red beads between 1655 and 1696 (Figure 3). It is interesting that the Oneida bead assemblage deviates from that of the Mohawks as the Oneida were the closest to the Mohawk, both geographically and politically (Snow 2008). It is plausible that the difference is a result of the depopulation of Mohawk communities, something that was not experienced by the Oneida. It appears the various colonial entanglements of the mid- to late-17th century impacted disparate Haudenosaunee populations in different ways. The Mohawk village of Caughnawaga provides insight on how bead colors reflect the historical impact of conflict and depopulation in the Mohawk Valley.

Table 1. Mohawk Bead Color Frequency by Period.

Color	1630-1646	1646-1659	1659-1666	1667-1682	1682-1693	1694-1712
Black	8.25%	2.52%	0.00%	9.96%	86.69%	84.21%
Green	4.31%	0.00%	19.61%	0.37%	1.32%	0.00%
Red	17.12%	48.18%	27.45%	82.16%	6.19%	0.00%
While/Blue	68.72%	49.02%	52.94%	6.77%	5.80%	15.79%
Yellow	1.60%	0.28%	0.00%	0.74%	0.00%	0.00%
Total beads	836	357	51	815	759	38

Table 2. Oneida Bead Color Frequency by Period.

Color	1635-1655	1650-1660	1655-1670	1665-1677	1685-1696	1696-1725
Black	10.51%	7.42%	22.51%	15.56%	25.42%	25.58%
Green	1.95%	1.57%	10.73%	0.26%	1.33%	6.20%
Red	12.65%	13.48%	38.18%	78.11%	55.58%	14.73%
White/Blue	70.82%	72.41%	25.74%	5.45%	16.41%	49.61%
Yellow	3.31%	4.39%	2.75%	0.53%	1.18%	0.78%
Other	0.78%	0.73%	0.09%	0.10%	0.07%	3.10%
Total beads	514	956	1053	3047	1353	127

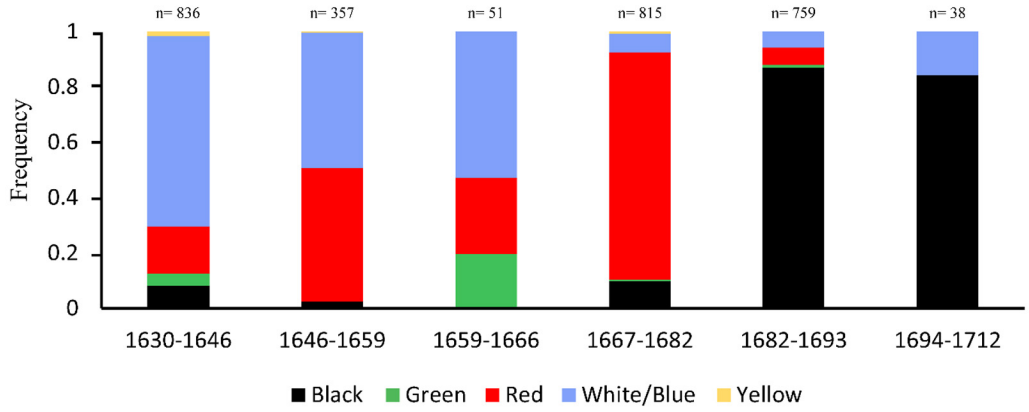

Figure 2. Frequency of Mohawk bead colors by time period.

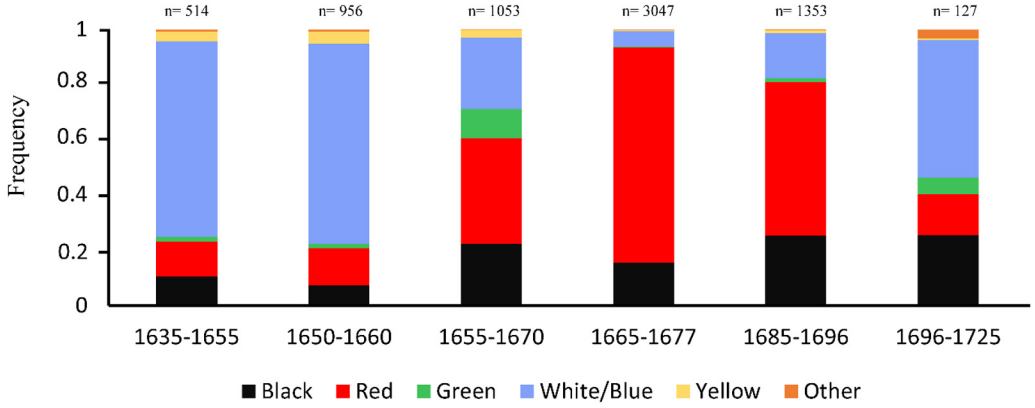

Figure 3. Frequency of Oneida bead colors by time period.

THE VEEDER SITE

Research on the Veeder site is surprisingly limited, considering that it is the only fully excavated Mohawk village. Thomas Grassmann (1969:638-647) directed the excavation and devoted only nine pages of his lengthy book, *The Mohawk Indians and Their Valley*, to this site. His book focuses on the history of the Mohawks during the historic period and utilizes historic documents, but did not incorporate the archaeological data in his synthesis. Most of his discussion about the excavations details the size and shape of the stockade and the longhouses.

Dean Snow conducted the most extensive research on the Mohawks and Caughnawaga (Snow 1995, 1996; Snow and Starna 1989). Snow, along with William Starna, focused on determining the population size of Mohawk villages (Snow and Starna 1989; Starna 1980). Snow (1995:443) and Starna (1980:380) found that the Veeder site was crucial in establishing a ratio to determine population numbers at Mohawk sites during the late 17th century. They proposed a ratio of 1 person per 20^{m2} with a possible 10% error.

Snow (1995:431-443) gives a brief overview of the site, discussing past research and excavations, provides information about Kateri Tekakwitha (the first North American Indigenous person to be canonized as a saint), demographics, the artifact assemblage, and gives an analytical summary. He determined the Veeder site dates to 1679-1693, when the site was abandoned after being burned by the French (Snow 1991). Snow (1995:443) bases the *terminus post quem* of the Veeder site on the presence of HG kaolin pipes and the large amount of small, round, black beads (Figure 4). He suggests that the actual Caughnawaga site, where Jesuits resided and Kateri Tekakwitha was baptized, was a different location known as the Fox Farm site, a village occupied between 1667-1682 (Snow 1995:431-432). Snow indicates that after Catholic Mohawks and French Jesuits returned to Canada, the remaining non-Catholics moved to the Veeder site (Snow

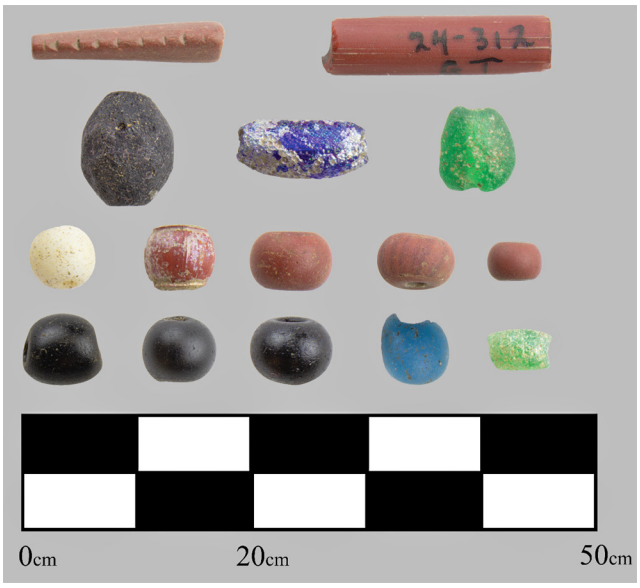

Figure 4. A sample of beads from the Veeder site.

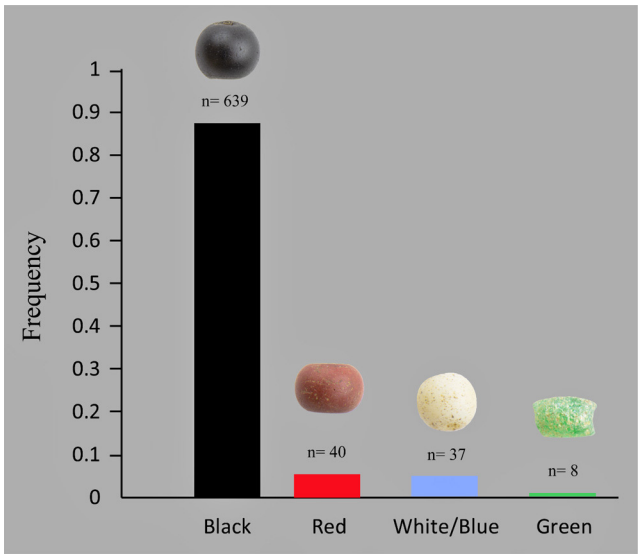

Figure 5. Frequency of bead colors from the Veeder site.

1995:431, 443). He also states that by 1679, Mohawks lived in standardized longhouses of three to four hearths, no longer expanding or contracting to accommodate families, due to their fragmented society (Snow 1995:443).

In addition to Snow, Rumrill (1985, 1991) has analyzed part of the artifact assemblage from the site, focusing on the beads and pipe stems. He briefly discusses the Veeder site, which he dates to 1679-1693, and falls within his "pea-size black bead period" (Rumrill 1991:35-36). As shown in Figure 5, the Veeder assemblage contains a total of 724 beads (Rumrill 1991), with the majority being black (88.26%), followed by red (5.52%), white/blue (5.11%), and green (1.10%). This is a dramatic shift from the previous phase (1667-1682) where red beads comprised approximately 82% and black beads represented 10% of all bead assemblages (n=819). To understand this dramatic shift in bead color, I contextualize the symbolic meaning of color within a historic framework and link the selection of black beads by the Veeder population with dramatic population loss through disease and warfare.

BEADS IN HISTORICAL CONTEXT

Population Loss Through Epidemics and Warfare

"The horrendous losses of the middle seventeenth century... threw the Iroquois into a convulsion of unending retribution against real and imagined enemies. Traditional enemies faced the rage of warriors seeking revenge for the constant loss of friends and family members" (Snow 2008:110). The Haudenosaunee in general, but particularly the Mohawk, suffered extraordinary population loss due to disease and warfare. Between 1630-1690, the Mohawk population decreased from 7740 to 1000 (Snow 2008:110). By 1700, the Mohawk population had dwindled to 620 individuals. No other tribe experienced as heavy a population loss as the Mohawks.

Although population decline for the Mohawks was a gradual process, specific years saw especially large losses. The Mohawk were afflicted by disease in the years 1634, 1636, 1646-1647, 1660, 1662-1663, 1672, 1679, and 1690 (Brandão 1997:151). Specific data on the number of Mohawks killed in warfare is not available; however, during the years 1603 and 1701, between 1738 and 2065 Haudenosaunee were killed and 3791-4157 were captured (Brandão 1997: Table F.1). Interestingly, only a few years after two-thirds of the Mohawk population moved to Canada in 1667, six raids took place, resulting in 730-930 Haudenosaunee captured and 300-600 killed (Brandão 1997: Table F.1). Although these data are representative of all the nations, the victims were likely predominately Mohawk, due to their poor relationship with the French at the time. It is possible the raids were a result of population loss, causing the Mohawks to seek revenge and bolster their population by obtaining captives.

The population loss had a profound effect on the Mohawk way of life. Haudenosaunee villages became increasingly populated by mourning survivors and adopted captives. The dramatic decrease in population wreaked havoc on the

traditional clan segments, resulting in the standardization of longhouse size with only 3-4 hearths (Snow 2008:111). This was a break from traditional longhouses that expanded and contracted based on the size of a clan segment.

Population loss not only affected intra-village settlement, but inter-village settlement as well. Epidemic disease and warfare caused a decrease in the number of villages, forcing village populations to merge. The Mohawk population shrank from 7740 to 2830 in a matter of months during the smallpox epidemic of 1634 (Snow 2008:100). The epidemic caused the Mohawk to almost immediately abandon their four villages, establishing three new, smaller villages (Snow 2008:100). Similarly, around 1679, the Mohawk again were forced to decrease the number of villages from three to two, though the departure of Catholic Mohawks was the cause, not disease (Snow 1995:429). Snow (1995:429) proposes that it was around this time the Fox Farm site (1667-1679) was abandoned, and the remaining non-Catholic Mohawks moved to the Veeder site. He also suggests that the non-Catholic residents of the White Orchard site, the upper castle, remained until 1689, when the Lipe site began to be constructed (Snow 1995:429). The Schenck site, the middle castle, was abandoned and the inhabitants moved to the White Orchard site or the Veeder site or both (Snow 1995:429). A smaller satellite hamlet may have been occupied, supporting no more than 100 people, but this site has yet to be located (Snow 1995:431). The decrease in Mohawk villages can be interpreted as a small-scale coalescence of the Mohawk. The intricate and intertwined political, ecological, social, and spiritual aspects of Mohawk life would certainly have been affected.

While distinct groups may not have moved into a singular region, the separate Mohawk clan segments were forced to combine. Matrilineal blood lines and extended families would have been brought together and intra-site marriages would have been more difficult.

Conflict

Unlike the Dutch and French, the English did not restrict trade with the Mohawk. The trade of guns between the Mohawk and British gave the Mohawk an exceptional advantage over other tribes and subsequently increased their political power within the League of the Haudenosaunee. The Mohawk remained close to the English, which led to a French attack, under the command of the Marquis de Tracy, which destroyed the Mohawk villages in 1666. The Mohawk learned there was a limit to British protection and signed a treaty with the French following the attack. As a result, the Mohawk lost some political power and also accepted Jesuit missionaries into the valley (Snow 2008:119). Regardless of their treaty with the French, the Mohawk maintained close ties to the English, both for economic and political reasons, as well as their belief in honoring the alliance forged with the British.

Following the end of King Philip's War, fought between the British and New England Native Americans, all other Native nations were deemed children of the Haudenosaunee (Snow 2008:124). This agreement would be called the Covenant Chain, binding the English and the Haudenosaunee going forward and allowing the English to claim hegemony over all the Indian nations construed as subordinate to the Haudenosaunee (Snow 2008:124).

In 1688, James II, who replaced Charles II after his death in 1685, was deposed and William and Mary assumed the throne (Snow 2008:126). In the same year as their accession to the throne, William and Mary declared war on France. The war was called King William's War in North America. While many of the French Jesuit and pro-French Catholic Mohawks had left the valley roughly ten years earlier, the new conflict enabled both sides to release pent-up anger.

This residual anger and new war led the New York Haudenosaunee to attack and raze the French settlement at Lachine Rapids in 1689 (Snow 2008:126). The French and their native allies retaliated in 1690, burning Schenectady, New York, and in 1693, aided by the Caughnawaga Mohawks who fled to Canada, attacked the Mohawk villages (Snow 2008:126). King William's War ended in 1697, but the Haudenosaunee and the French continued to fight on (Snow 2008:127).

Catholicism in the Mohawk Valley

Beginning in the 1640s, French Jesuits attempted to convert the Mohawk. However, Jesuits were no longer allowed in Mohawk territory after the epidemic of 1646, which they believed was the result of a small black box left by Father Isaac Jogues. The Mohawks believed he had cursed them and upon his return from a brief trip to Canada he was killed (Grassmann 1969:119; Snow 2008:114). Not until 1666-1667 were Jesuits allowed back into Mohawk territory, following peace between the Mohawk and the French. Two missions were set up, one in the most western village and the other in the most eastern one. However, tension between Catholic and traditional Mohawks increased, resulting in roughly two-thirds of the population moving to Canada in 1679 (Snow 2008:124). Notably, many of the inhabitants of the Fox Farm site (also called Caughnawaga) fled to a settlement at Laprairie, south of Montreal, and would establish a village slightly to the west, also named Caughnawaga. By 1673, there were more

Mohawks at La Prairie than in the Mohawk Valley (Snow 2008:122). The last Jesuit left Mohawk territory in 1684.

While the schism between Catholic and traditional Mohawks is well documented, it has not been discussed or examined through material culture. Surely a group that places high value or strong spiritual significance in both color and objects would express their beliefs with objects, specifically beads, clothing, and powerful spiritual items. Likewise, Catholicism imbues many objects with ritualistic and spiritual significance. Jesuits, as well as Catholic Mohawks, would have had rosaries, rings, crucifixes, and other religious paraphernalia. It is likely that objects expressing spiritual beliefs have been excavated but not interpreted through this lens. An analysis of adornment items is often difficult, as determining their meaning requires fine data collection and many of the items that would have connoted meaning are perishable and do not survive in the archaeological record. However, beads, used for adornment both daily and ceremonially, do.

Beads and Mourning

Historic accounts note red, blue, and white as connoting positive aspects of life such as well-being and harmony. It is therefore reasonable or plausible that black – the dialectic color of white – would have been prominently used to represent the anti-social or lack of well-being. Mourning among the Mohawk was a social process, outwardly expressed through color symbolism. Indeed, it is reasonable to assume their state of being (mourning) would have continued to be expressed by adornment throughout the year-long mourning process. Upon the death of an individual, particularly an important individual, clan and moiety members from different villages would provide the dead with the things they would need in the afterlife, such as wampum or glass beads, clothing, and furs (Brandão 2003:83; Snow 2008:105-106). Some family members would paint their faces or whole bodies black (Engelbrecht 2003:66; Snow 1996:116). Furthermore, according to Hamell (1983), black beads could be used as a countercharm, identified with evil, death, or the intended victim, and were reserved to the deceased's mourning kinsmen.

DISCUSSION

I argue that the use of black beads by the Mohawk ca. 1679-1693 was an expression of their dramatic population loss due to epidemics and political and religious conflict (Figure 6). The possible use and symbolic meaning of black beads at the Veeder site becomes clearer when Hamell's analysis is combined with Snow's (1994:431-432) assertion that Catholic Mohawks had already left the valley, thus making it unlikely that black beads were used in rosaries.

It is apparent that black beads at the Veeder site would have been used and understood in a "traditional" framework. If the semantic meaning of blackness and darkness – connoting death, mourning, and the absence of well-being and harmony – was embedded in black beads by the inhabitants at the Veeder site, their state of being can be interpreted as negative, anti-social, and mourning.

While the Mohawk were using similar items between 1667-1679 and 1679-1693, there was a distinct change in the historic glass bead assemblages of the Fox Farm (1667-1679) and the Veeder site (1679-1693). As Snow (1995:429, 431) notes, the non-Catholic population at the Fox Farm site moved to the Veeder site when Catholic Mohawks emigrated to Canada. The dramatic change from red beads, which have been used to define the 1667-1682 period, to black beads (1682-1693) (Rumrill 1991:31, 35) can be interpreted as a result of the coalescence of the Mohawk. As previously discussed, color was an important aspect of Mohawk culture and was intertwined with almost all aspects of life. The depopulation, warfare, and epidemics that led to the coalescence in the Mohawk Valley are likely the same factors that led to the change in bead color. Simply put, the interpretation of bead color change, when incorporated with other lines of evidence, may be a way to better understand the fission and fusion or coalescence that occurred in the Mohawk Valley, specifically between 1667-1679 and 1679-1693.

Johnson (2000:125) discusses the use of colored paint or cloth tied around the head by the Narragansetts during the Pequot War to mark themselves as English allies. He argues that this practice may be an adaptation of the Native practice of symbolizing group identity. This notion may be applicable to the color of the beads among the Mohawks, where specific bead colors signify a connection to or a membership in a specific group, i.e., Catholic or non-Catholic and/or, like the Narragansetts, pro-British or anti-British. However, the color symbolism of beads is likely linked to the spiritual state of the Mohawk and not their political relationship with the British. When the symbolic meaning of colors in Mohawk culture is taken into consideration, it becomes apparent that bead color during the 1679-1693 period could not be related to their relationship with the British. During the black bead period (1682-1693), the Mohawk had a strong relationship with the British, considering the British to be their brothers against the French. For the Mohawk, black is not a color of peace, well-being, hope, or even war; it is an anti-social or negative color, typically associated with death and mourning.

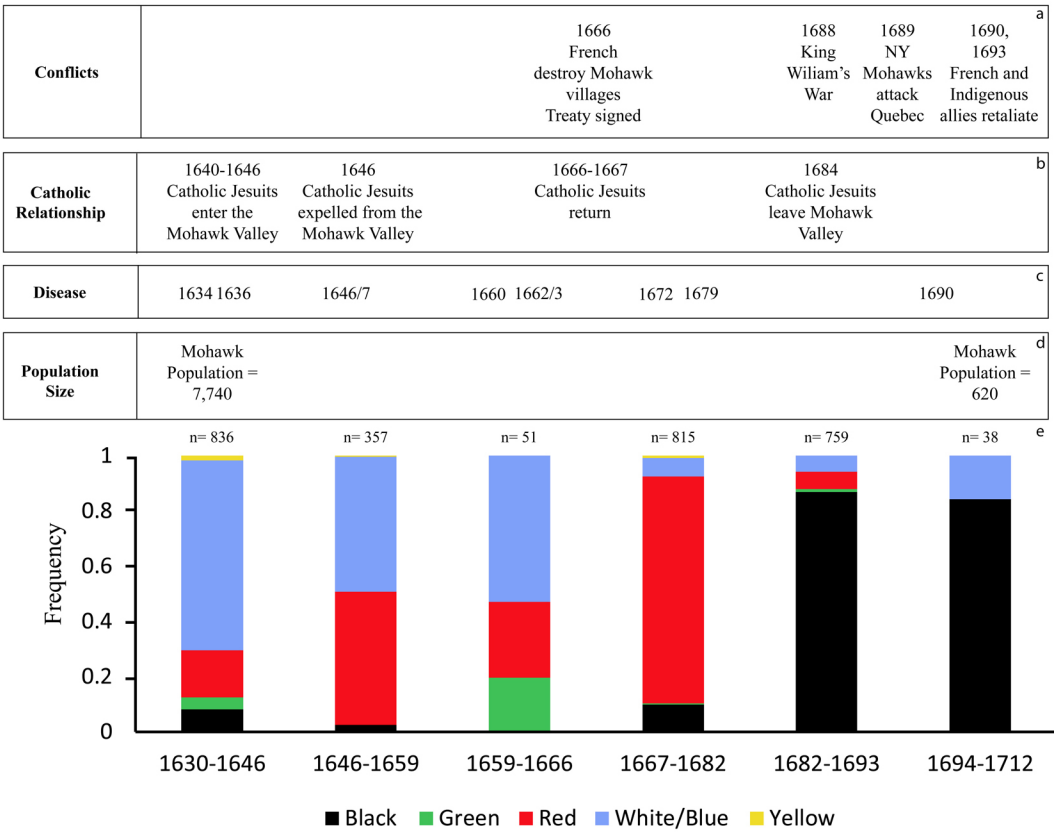

Figure 6. Bead color frequency by time period in the Mohawk Valley (e) related to a) Mohawk and European conflicts in the Northeast; b) Jesuit occupation in the Mohawk Valley; c) epidemics that affected the Mohawk; and d) change in population size of the Mohawk between 1630 and 1712.

CONCLUSION

Objects of adornment are a unique class of artifacts that have the potential to provide important and insightful information that enables archaeologists to engage with past peoples' inward and outward expression. While investigating the manufacturing process and source of glass beads and their temporal placement continues to be an important avenue of research in exploring past exchange networks and political relationships, there must also be an attempt to understand how beads were used as expressions of status, identity, and spirituality. For the Haudenosaunee, materiality and color were entwined and possessed the power to alter the spiritual and physical world. The preponderance of black glass beads among the Mohawk between ca. 1682 and 1693 was likely a result of their dramatic population decline and reflects the emotional and spiritual state of the remaining communities. As the data from the Mohawk Valley indicate, there was a dramatic shift from the use of red beads to black. This change did not occur among the Oneida who, although closely linked to the Mohawk, did not experience population decline at the magnitude of the Mohawk. Moreover, the Oneida did not have to grapple with the emotional burden caused by years of intra-societal conflict and the willful emigration of community members. By examining the multiscalar entanglements of politics, religion, and materiality, it is possible to contextualize the meaningful use of objects by past populations.

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ANALYZING AESTHETICS AND CONTEMPLATING COSMOLOGIES: GLASS BEADS AND THE SOCIO-POLITICAL ECONOMIES OF THE HAUDENOSAUNEE CONFEDERACY, CA. 1655-1754

Kaitlin LaGrasta

This paper compares glass bead color, shape, and size patterns from 19 Seneca, Cayuga, Onondaga, Oneida, and Mohawk towns, ca. 1655-1754. During this time, Haudenosaunee (also known as Iroquois) Nations sought trading relationships with Europeans and other Indigenous communities to obtain goods by choice, rather than by dependence. As actors with agency, Haudenosaunee Nations intentionally sought specific visual characteristics of glass beads to generate desired outcomes. Within the context of Haudenosaunee cosmology, the colors red, white, and black have aesthetic and ideological power because their animacy evokes dynamic states of being and facilitates transformation. Considering glass bead color, shape, and size patterning across multiple contemporaneous towns in the Haudenosaunee Confederacy illuminates nation-specific aesthetic preferences, trends in bead use, and draws attention to Haudenosaunee economic and aesthetic motivations for wearing and exchanging glass beads during the fur trade.

INTRODUCTION

The Haudenosaunee Confederacy presently consists of the Mohawk, Oneida, Onondaga, Cayuga, Seneca, and Tuscarora Nations.[1] Historic and current Haudenosaunee (Iroquois) lands are situated in what is now New York state and the provinces of Ontario and Quebec. This paper focuses specifically on fur trade-era (17th-18th centuries) Seneca, Cayuga, Onondaga, Oneida, and Mohawk settlements in New York (Figure 1).[2] Historically, Haudenosaunee towns relocated periodically out of both ecological and sociopolitical necessity (Gerard-Little 2017). Moreover, Haudenosaunee populations during this time were heterogeneous, as evidenced through incorporation of captives from other tribes into their communities through individual and group adoption (Jordan 2013; Richter 2011) as well as marriage (Waterman 2008).

George Hamell's publications (1983, 1992, 1996) on color symbolism and Haudenosaunee cosmology shifted the focus of North American glass bead research from a narrative of European influence to a discussion of Indigenous agency. Hamell examined color symbolism in the Seneca context to contemplate the metaphysics of the colors red, black, and white in Seneca cosmology and material culture. While widely used and cited within archaeological scholarship, Hamell's (1992) linguistic interpretation of color symbolism in the Seneca context is based in Eurocentric color theory, and the articles are not completely transparent about their sources from within the Haudenosaunee community. In this paper, I extend this analysis by examining color in the context of Haudenosaunee cosmology and ceremony, using work by Seneca archaeologist Arthur C. Parker, non-Indigenous scholar William Fenton, and Tuscarora scholar J.N.B. Hewitt, who directly attributed information to Seneca and/or Haudenosaunee voices in their writing. This paper expands upon Hamell's groundwork on color symbolism using available written work, with the intention of providing a baseline for future interpretations on color involving a partnership with Haudenosaunee community members.

As Hamell worked within the Seneca context, I begin my data analysis with glass bead assemblages from three eastern Seneca sites: Ganondagan (ca. 1670-1687), White Springs (ca. 1688-1715), and Townley-Read (ca. 1715-1754). I collected data from domestic-context assemblages at the three sites to serve as a baseline of comparison. Next, I reanalyzed published datasets from other contemporaneous Haudenosaunee Confederacy towns, which include Seneca, Cayuga, Onondaga, Oneida, and Mohawk glass bead assemblages. I then discerned whether the glass bead color patterns I observed at Ganondagan, White Springs, and Townley-Read are consistent across the other Haudenosaunee towns. Finally, I integrated the data analysis with my discussion on Haudenosaunee cosmology and aesthetics to offer some potential explanations for the patterns I observed in the glass bead data.

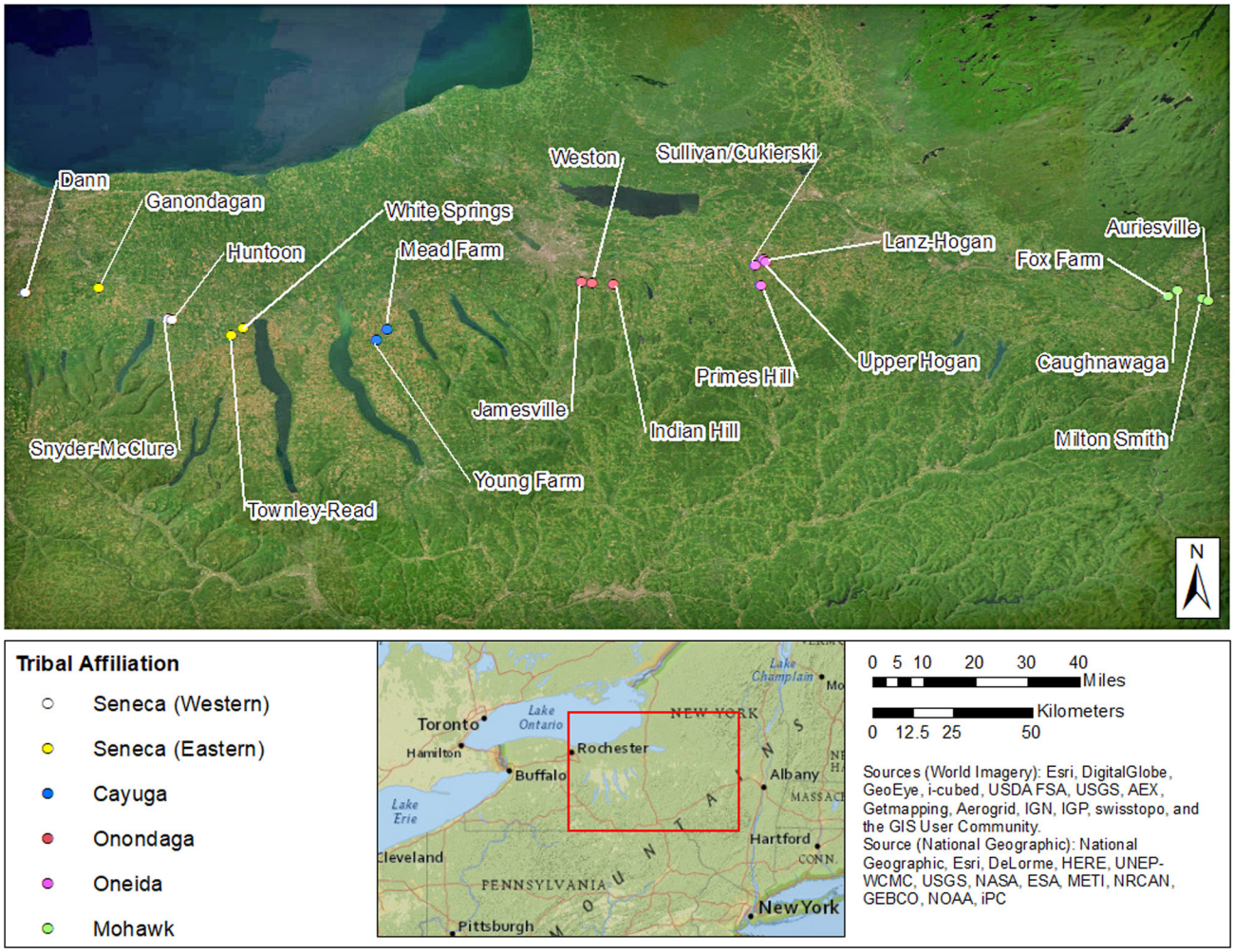

Figure 1. Locations of the sites mentioned in text (all images by the author).

DISCERNING HAUDENOSAUNEE AESTHETICS IN THE 17TH AND 18TH CENTURIES

Using work by Ruth Phillips (2013), I integrate the discussion of color within a broader framework of aesthetics to contextualize glass beads and their colors within Haudenosaunee visual vocabulary. Phillips (2013) wrote about four Anishinaabe (also known as Ojibwe or Chippewa) visual strategies which include animacy, visual ambiguity, space, and ornamentation. Anishinaabe lands and populations, historically and presently, are situated in the Upper Great Lakes region. The Seneca Nation had trading relationships with tribes of the region, including those studied by Walder (2018) such as the Ho-Chunk, Potawatomi, Meskwaki, Tionontate-Wendat, Odawa, and Anishinaabe. The application of Phillips' visual strategies to a Haudenosaunee context is appropriate, based on these cross-cultural relationships. Further, Haudenosaunee and Anishinaabe scholar Vanessa Watts (2013) bridges Haudenosaunee and Anishinaabe cosmologies in her discussion of Place-Thought via the Creation stories of First Woman and Sky Woman.

In this article, I primarily consider animacy to examine how glass beads both reflected and influenced Haudenosaunee aesthetic, economic, social, and political attitudes, and how Haudenosaunee people use glass beads to carry messages and convey meaning during the fur trade. From a Haudenosaunee perspective, animacy is fundamental to the existence of every human and non-human in the world. It is the "embodiment of the feminine" because it is derived from Sky Woman (Watts 2013:23). As she was falling from the sky, birds helped Sky Woman get onto the back of Turtle, where she created the land from her body. As such, the human world and the non-human world are inseparable; there is no binary, oppositional distinction between nature and culture. Within a framework of "Place-Thought" – derived from the experience and existence of

Sky Woman – the land is animate because it is "alive and thinking" and humans and non-humans "derive agency through the extensions of these thoughts" (Watts 2013:21). In discussing the art from Ganondagan, Hill (1986:18) echoed this sentiment: "everything has animate energy." As Phillips (2013:69) notes, "animate presence is dependent on human interactions with other-than-human beings." Beads are such animate, other-than-human beings that influence, and are influenced by, the decisions and actions of Haudenosaunee people. The historical, social, and aesthetic roles of wampum are broadly analogous to those played by glass beads.

By the mid-17th century, glass beads had been integrated into Haudenosaunee decorative tradition for nearly one hundred years, and their use was built on an even older visual vocabulary and cosmological framework centered around shell beads, including wampum. According to oral tradition, Hiawatha was the first person to string together shell beads to be condoled after his family was killed (Tehanetorens 1976; Williams 2018). He and the Peacemaker brought The Great Law of Peace to unite the Mohawk, Oneida, Onondaga, Cayuga, and Seneca Nations under the Haudenosaunee League (Tehanetorens 1976). The Great Law of Peace establishes strength through unity (Ransom and Ettenger 2001), as well as reciprocal responsibilities within one's family and community (Williams 2018). The Great Law of Peace, as well as other treaties like Two Row Wampum, are recorded on woven wampum belts.

These agreements were regularly renewed or "polished" to preserve them and to maintain their principles of peace, good mind, and strength (Ransom and Ettenger 2001). "Polishing" may include gift giving, which is an essential part of maintaining individual and community well-being (Creese 2016). As such, the shell beads used in wampum belts are involved in "making and sustaining relationships" through a collective process between humans and non-humans (Creese 2017:61; Watts 2013).

From a Haudenosaunee perspective, the Earth exists as the celestial tree (also called the Tree of Life or the Tree of Peace) on the back of Turtle, who is swimming in the sea (Watts 2013), and the World's Rim exists beyond this sphere (Fenton 1962; Hamell 1992). Above the Earth is the Sky Dome, "from where light and life descend," and below the Earth is where "powerful evil creatures" like serpents and horned monsters live (Hill 1986:18). Within the Seneca context, the Edge of the Woods is the physical and metaphysical threshold around a town, which is "the world in a microcosm" (Hamell 1992:454). This space is where rites of passage and social exchanges between human beings and other-than-human beings occur (Fenton 1987; Hamell 1992:454). Grandfathers dwell at the edge of the woods and in other liminal spaces such as below the water and in caves (Fenton 1987; Hamell 1992). Grandfathers, such as False Faces (Fenton 1987), Panther (longtail) (Hamell 1998; Hewitt 1904:204), and Serpent (Hamell 1998; Hewitt 1928:466), are keepers of important substances and their associated rituals. They interact with individuals who enter these physical spaces (Fenton 1987).

Wampum primarily originated from the Mid-Atlantic coast, which is located beyond the World's Rim of a Seneca town, and at the World's Rim where the land meets the ocean. Wampum ceremonies occurred at the threshold of a town to link "insiders to outsiders… promoting social, political, and economic change" (Hamell 1981:12). Wampum also had and continues to have uses in "public affairs, and in official communications, in ritualistic and fiducial transactions" (Hewitt 1907:907). In addition to shell beads, other materials like red stone (pipestone/catlinite and slate) and copper were exchanged between Northeastern Indigenous communities prior to the arrival of Europeans (Hamell 1992:451). These so-called "exotic" objects contained "an elevated cultural efficacy" within Haudenosaunee communities due, in part, to their origin from the "cultural frontier" beyond the World's Rim, where they could be exchanged with other humans and other-than-human beings, such as Grandfathers (Hamell 1992:454). As such, the glass beads brought by Europeans to Haudenosaunee country "were perceived and received as analogous" to existing material culture (Hamell 1992:459; Phillips 2013:173-174).

Hamell (1992:456) argues broadly that material culture is used in ritual contexts to aid in transforming from one state of being to another. However, as the animacy of human beings and other-than-human beings is inherent and not limited to ritual contexts, it may be unreasonable to impose a binary between "ritual" and "daily life" in Haudenosaunee contexts. I assert that Hamell's readings are not only applicable to ritual situations, they can also be used to interpret domestic assemblages at Haudenosaunee sites.

Haudenosaunee glass bead use during the 17th-18th centuries included embroidered, woven, and strung beadwork worn by men, women, and children. Embroidered beadwork adorned clothing, including skirts, leggings, coats, hides, headwear, and footwear. Strung beadwork includes necklaces, bracelets, and hair adornment. Strings of beads could also be worn around the waist, ankles, arms, and legs, or hung from the nose and/or ears (Karklins 1992). These categories of embroidered, woven, and strung beadwork do not have precise boundaries and realistically existed, and continue to exist, along a continuum. Karklins (1992) also cites other personal items adorned with glass beads, including object inlays (e.g., pipes, clubs, and tomahawks), knife

sheaths, blankets, pouches, and cradleboards. However, the nature of the archaeological collections I examined for this article makes it difficult to identify glass beads used for these purposes.

BROADENING HAMELL'S INTERPRETATIONS OF COLOR

In his writings about Seneca cosmology, Hamell points to white, red, black, and yellow as metaphysically significant colors. He interprets whiteness as representative of positive "social" states of (well) being, deriving this interpretation from the association of white wampum and silver with life, wealth, and peace (Hamell 1992:455-456). White wampum was used in "rituals of re-creation and resuscitation" (Hamell 1981:6). In addition to white shell, Hamell (1998) argues that other white or reflective materials – including white stone (flint, chalcedony, quartz) and metal (silver) – had similar agentic qualities. White stone and metals, in addition to glass beads, are also associated with the scales of the Serpent; they are carried in medicine bundles to achieve success in courtship, warfare, and hunting (Hamell 1998:270-271). The association between white and positive states of well-being is also evident in the Seneca language. According to site manager and Seneca faithkeeper Peter Jemison, "Ganondagan" was chosen as the name of Ganondagan State Historic Site because it means "white village," which "has more to do with ideals of purity and peace than with the color white" (Jones 1986). Though Hamell (1992:465, note 9) argues white is a ritually "bivalent" color, meaning it may be applied to "socially constructive" or "socially destructive" purposes, he only discusses the "socially constructive" agency of white in a Haudenosaunee context throughout his paper.

Hamell's interpretation of white is consistent with what others have written. Hewitt (1907:907) indicates that white wampum is associated with "peace, health, welfare, and prosperity." Hill (1986) writes that the White Roots of Peace exist at the base of the Tree of Peace, lead in the four cardinal directions, and guide people to the center of the Haudenosaunee Confederacy. Both white and red are also associated with the White Dog Sacrifice, during which a pure white dog (sometimes more than one) is ritually sacrificed, painted with red dots, and burned in a fire alongside tobacco (Tooker 1965) and other objects such as white wampum and ribbons (Blau 1964:97). Euro-American observers' descriptions of the Seneca White Dog Sacrifice in the 18th and 19th centuries also note feasting on the dog and sprinkling its (white) ashes at the door of every house (Tooker 1965:131-135). Modern practices of this ceremony may involve a white basket of ribbons rather than a dog (Blau 1964:99). The White Dog Sacrifice provokes socially positive outcomes: to prevent and heal sickness, assure agricultural productivity, secure success in hunting, and obtain protection from natural disasters (Blau 1964:104; Tooker 1965).

Hamell (1983:7, 1992:456-457, 465) argues red can represent "potent" substances associated with life. These substances include blood, berries, and fire (Hamell 1992:456). Berries are associated with healing, medicine, and liminality (Hamell 1986). Hamell (1992:465) also argues that red can evoke "antisocial" states of being like warfare, which he deduced from the use of red pigments in burials and on wampum belts. Bradley (2011:26) and Puyo (2014) observed painted wampum belts with red pigments soaked into the sinew and rawhide. A red wampum belt can communicate war (Hamell 1996; Woodward 1979:29). Hamell (1992:456-457) argues that red, like white, is "bivalent:" when red is combined with white, it can be "socially constructive" and when it is combined with black, it can be "socially destructive."

Hamell (1992:456-457) argues black is an "inanimate" color, representing death, mourning, and "asocial" states of being. He deduced this interpretation from the word for "black" in the Seneca language which means "the color of (char)coal" (Chafe 2014). Hamell (1992:465) notes that a period of mourning is marked by extinguishing fires and painting faces black with charcoal. He also points out that condolence wampum is deep purple (Hamell 1992:465). According to J.N.B Hewitt (1907:907), dark purple wampum represents the potential for "hostility, sorrow, death, condolence, and mourning," which is in line with Hamell's association of blackness with mourning. However, glossing black and purple as the same "dark" color (Hamell 1992:470) may obscure the distinctiveness of purple as it relates to purple wampum. Further, Hamell's analysis of black as only representing death and mourning may be too limited. In terms of blackness, it is helpful to consider Kanohwa'gëgo'na, "the Great Black Door, through which all good and evil messages must come to reach the confederate house of lords and council" (Parker 1916:96). The Great Black Door is significant in both ritual and in daily life. It is the entrance to the longhouse, the western threshold of the Haudenosaunee Confederacy, and the entrance (also associated with the west) to the Other World and to the Village of Souls (Hamell 1981:13; Parker 1916). One approaches the Great Black Door from the east, sets aside weapons, and waits to be greeted and brought inside by the host (Hamell 1981:14). The door is a site of transformation, illustrating the fluid relationship between west and east, darkness and lightness, and visitor and resident.

Hamell (1992:462) makes the case that yellow was an unpopular color because of its association with sickness. Hamell derives this interpretation from the Seneca word for yellow which translates as "the color of bile" (Chafe 2014). Yellow skin is also a symptom of jaundice or viral hepatitis (Hamell 1992:462). This is a limited interpretation, as the sun and the sunflower are important to creating and sustaining life. The sun exists in the Upper World above the Celestial Tree, both of which give light and life to everything below (Parker 1912). Flowering plants and "stars" also exist in the Upper World and grow from the celestial tree, providing light (Parker 1912). The sunflower provided the only source of light for Earth during creation, standing in for the Celestial Tree, according to Hewitt's recording of Earth Grasper (Adams 2013:91). Overall, it seems that yellow has a more positive valence than Hamell hypothesized.

According to Fenton's (1962, 1987) interpretations, the components of False Face exemplify the integrated relationship of red, white, and black and their association with the life-giving force of the sun (yellow). False Faces exist beyond the World's Rim and are noticed by hunters who encounter them in the forest (Fenton 1987:95). They have contorted faces from being hit with a mountain in an interaction with the Creator. Their faces may be red, black, white, blue, or split, and their color and design come to people in dreams.[3] Allegany Seneca citizen Chauncey Johnny John explained that in return for tobacco and corn mush, False Faces offer protection and remove sickness (which they also play a role in creating) (Fenton 1987:119-120). To prepare for the False Face ceremony, women anoint the masks with sunflower (yellow) oil (Fenton 1987:143). During the ceremony, participants crouch around the fire (red/yellow), imitating the False Face Grandfathers at the edge of the woods (Fenton 1987:277). Participants scoop up hot coals (red), which were once charcoal (black). The coals turn to ashes (white) once they cool and are subsequently blown to heal disease. The False Face ceremony therefore maintains social balance through a collective process. It demonstrates how red, black, and white, as well as yellow substances, are important complementary components for and conduits of transformation.

Though Hamell writes from within the Seneca context, it is not unreasonable to expand his interpretations to the other four nations within the Haudenosaunee Confederacy during the 17th and 18th centuries. At this point, the Mohawk, Oneida, Onondaga, Cayuga, and Seneca Nations were united under The Great Law of Peace and had reciprocal responsibilities to one another.

GLASS BEADS FROM THE SENECA GANONDAGAN/ WHITE SPRINGS/TOWNLEY-READ SITE SEQUENCE

The towns of Ganondagan (ca. 1670-1687), White Springs (ca. 1688-1715), and Townley-Read (ca. 1715-1754) were occupied sequentially by the same eastern Seneca community in what is today Ontario County, New York. These sites have been reliably dated by researchers using a variety of methods, including historical documents and diagnostic artifacts (Jordan 2008:154-162, 2010; Jordan and Gerard-Little 2019:39-40; Parmenter 2010). Ganondagan was occupied during a "peak period in Haudenosaunee power" when the Haudenosaunee Confederacy was at war with other extra-regional Indigenous communities (Jordan and Gerard-Little 2019:41). Historical accounts suggest that Ganondagan was not palisaded, and excavations by Dean and Barbour did not identify one (Dean 1984; Jordan 2018:178-179). In 1687, upon receiving intelligence from Iroquoian allies of the Marquis de Denonville expedition that they were about to invade Seneca country, the community at Ganondagan burned their town and fled to what became White Springs (Parmenter 2010:193-195). The French-Indigenous Denonville expedition subsequently burned and plundered what was left at Ganondagan (Jordan 2018:181; Parmenter 2010:194).

The early years at White Springs were turbulent due to continued warfare with other Indigenous Nations and associated population decline, as well as the spread of disease (Brandão and Starna 1996:215; Jordan 2008:55-57). Historical and archaeological analysis of White Springs suggests the town was a densely populated, nucleated settlement with a palisade in an easily defensible location (Jordan 2018:181-182).

Between 1700 and 1701, the Haudenosaunee Confederacy, New France, New York, and western Indigenous Nations (including Ottawas, Potawatomis, Wendats, Meskwakis, Miamis, and Ojibwes) brokered treaties to secure hunting territories within the western Great Lakes and calm collective hostilities (Brandão and Starna 1996; Jordan 2008:58). However, the Seneca Nation still faced threats of violence resulting from Queen Anne's War (1702-1713), as well as ongoing conflicts with and between other western Indigenous Nations (Jordan 2008:61-62). After the 1713 Treaty of Utrecht formally ended Queen Anne's War, a period of relative regional peace came to Seneca country (Jordan 2008:63-64). Subsequently, Haudenosaunee diplomacy during this period gave the Seneca Nation considerable political and economic power as geographic "middlemen" between the Upper Great Lakes and Albany (Jordan 2008:64-65).

The Seneca community at White Springs moved to Townley-Read in a planned settlement relocation around 1715, likely due to resource depletion around White Springs (Gerard-Little 2017). Townley-Read was part of a neighborhood within the New Ganechstage Site Complex, an unpalisaded, dispersed settlement situated in low-lying terrain. Townley-Read contained two-family "short longhouse" households placed in a line, 60-80 meters apart, adjacent to a waterway (Jordan 2014:64). Jordan (2008, 2018) argues this settlement structure was advantageous for reducing labor demands for both men and women, and the proximity (within 75 km) to newly established European trading posts at Niagara and Oswego likely reduced travel times to trade.

During 2019-2020, I cataloged all the glass beads from domestic context excavations at Ganondagan, White Springs, and Townley-Read using the Kidd and Kidd typology (1970) with supplemental guidance from Karklins (1985, 2012). The *Munsell Bead Color Book* (2012) was used in normal daylight conditions to determine a specimen's color. A strong, concentrated light source was used to assist with recognition of bead core color.

Kidd and Kidd designations are used to describe bead size by diameter: very small (<2.0 mm), small (2.0-4.0 mm), medium (4.0-6.0 mm), large (6.0-10.0 mm), and very large (>10.0 mm). The term "seed bead" is used colloquially to generally describe very small, small, and medium circular beads.

Ganondagan

Archaeologists associated with the private cultural resource management firm Dean and Barbour Associates (henceforth "Dean") excavated domestic spaces at Ganondagan between 1982 and 1984, under a contract with the New York State Bureau of Historic Sites (Dean 1984). Field methods included geophysical survey, test unit excavation, and mechanical trenching. Artifacts were recovered using quarter-inch mesh and flotation.

The excavations recovered exactly 700 glass beads. This count differs from what is reported in Dean (1984) for two reasons: the excavation report examines beads from only the 1983 field season (n=378), and my examination determined that the material of some beads from the 1982, 1983, and 1984 excavations was misidentified in the site report.

Red is the most common bead color (70.9%), followed by black (16.6%), blue (6.9%), white (3.9%), polychrome (1.0%), green (0.7%), and yellow (0.1%) (Table 1). Round beads dominate the assemblage (76.7%), followed by circular (14.3%), tubular (7.7%), truncated teardrop (0.1%), and polyhedral (0.1%). Large (55.1%) is the most common size, followed by medium (26.7%), small (17.0%), and very small (0.4%). No beads are very large, and five beads (0.7%) are broken in such a way that their original size was unidentifiable ("unid."). Only one bead in the assemblage is wound; the remainder are drawn.

Table 1. Characteristics of Glass Beads from Domestic Contexts at Ganondagan.

Ganondagan Glass Beads (1670-1687) Dean and Barbour Excavations, 1982-1984								
Color	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**	**Size**	**Count**	**% of Total**
Red	496	70.9	Round	537	76.7	VS	3	0.4
Black	116	16.6	Circular	100	14.3	S	119	17.0
Blue	48	6.9	Tubular	54	7.7	M	187	26.7
White*	27	3.9	Oval	7	1.0	L	386	55.1
Polychrome	7	1.0	Truncated teardrop	1	0.1	VL	0	0
Green	5	0.7	Polyhedral	1	0.1	Unid.	5	0.7
Yellow	1	0.1						
			Drawn	699	99.9			
			Wound	1	0.1			
* Includes light-colored beads (26 white and 1 oyster white).								

White Springs

The White Springs Project, directed by Dr. Kurt Jordan (Cornell University), excavated domestic contexts at White Springs from 2007 to 2015. Field methods included geophysical survey, shovel test pit excavation, test unit excavation, mechanical stripping, and pedestrian survey. Soils were screened using quarter-inch mesh in plowzone soils and eighth-inch mesh in feature soils. Soil samples were taken for flotation from features, unless the feature was smaller than 0.3 liters, in which case it was screened using eighth-inch mesh.

The White Springs assemblage consists of 479 glass beads (Figure 2). Red beads dominate (50.5%), followed by black (13.6%), blue (11.1%), white (10.9%), polychrome (9.8%), yellow (2.7%), and green (1.5%) (Table 2). The most common shape is tubular (40.7%), followed by round (39.5%), oval (8.1%), circular (5.8%), wound faceted (2.5%), and truncated teardrop (1.7%). The remaining 3% consists of polyhedral (n=2), twisted polyhedral (n=2), unidentifiable shapes due to damage in manufacture or from use/breakage (n=2), and raspberry (n=1). The most common size is large (35.7%), followed by small (34.4%), medium (22.5%), very large (4.6%), and very small (0.6%). The sizes of ten broken beads (2.1%) are unidentifiable. Lastly, the assemblage is dominated by drawn beads (93.9%). Only 5.6% of the assemblage consists of wound varieties, and less than 1.0% (n=2) of the assemblage is unidentifiable.

Figure 2. A selection of glass beads and a glass button (upper left) from House 4 at the White Springs site.

Townley-Read

The Townley-Read glass bead assemblage was recovered from domestic contexts through excavations by the Townley-Read/New Ganechstage Project, led by Kurt Jordan and Dr. Nan Rothschild (Columbia University), advised by Seneca faithkeeper Peter Jemison, from 1996 to 2000. Field methods included geophysical survey, shovel test pit excavation, test unit excavation, mechanical stripping, and pedestrian survey. Soils were screened using quarter-inch mesh in plowzone soils and eighth-inch mesh in feature soils. Soil samples were taken for flotation from some features.

The Townley-Read assemblage consists of 73 beads.[4] White is the most common color (67.1%), followed by black (11.0%), green (6.8%), blue (6.8%), polychrome (4.1%), red (2.7%), and yellow (1.4%) (Table 3). The most common shape is circular (67.1%), followed by round (26.0%), oval (2.7%), faceted (2.7%), and tubular (1.4%). The most common size is small (58.9%), followed by very large (20.5%), large (9.6%), very small (6.8%), and medium (4.1%). Drawn beads dominate at Townley-Read (84.9%); the rest are wound.

The sample size of domestic-context glass beads at Townley-Read is small compared to those of Ganondagan and White Springs. However, Herlich's (2008) analysis of glass beads from domestic, burial, unknown, and surface contexts at Townley-Read suggests it is representative of the overall glass bead color patterning across the site, as red beads represent just 2.7% of the overall Townley-Read assemblage, as well as less than 2.0% of the burial assemblage.

Summary

Across the Ganondagan/White Springs/Townley-Read site sequence, there is a transition from a preference for red glass beads to a preference for white (Figure 3). At Ganondagan, over 70.0% of the beads in the domestic assemblage from the Dean excavations are red. Wray and Graham's (1985) data from burials and mixed contexts also indicate that red is the most common bead color at the site (LaGrasta 2021:33-36). Red remains the most common bead color at White Springs, with over 50.0% of the assemblage comprised of red beads, though this is a decrease from Ganondagan. Though the Townley-Read glass bead assemblage is much smaller than those of Ganondagan or White Springs, supplemental information from Herlich's (2008) analysis of Townley-Read burial contexts confirms that white is the most common bead color there (LaGrasta 2021:41-43). This is a marked difference from Ganondagan and White Springs. Additionally, across all three sites, black is consistently the second most common bead color.

The dynamism of glass bead shape and size across the Ganondagan/White Springs/Townley-Read site sequence demonstrates distinctive trends in bead use, which

Table 2. Characteristics of Glass Beads from Domestic Contexts at White Springs.

White Springs Glass Beads (1688-1715) The White Springs Project Excavations, 2007-2015								
Color	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**	**Size**	**Count**	**% of Total**
Red	242	50.5	Tubular	195	40.7	VS	3	0.6
Black*	65	13.6	Round	189	39.5	S	165	34.4
Blue	53	11.1	Oval	39	8.1	M	108	22.5
White**	52	10.9	Circular	28	5.8	L	171	35.7
Polychrome	47	9.8	Faceted	12	2.5	VL	22	4.6
Yellow	13	2.7	Truncated teardrop	8	1.7	Unid.	10	2.1
Green	7	1.5	Unidentifiable	3	0.6			
			Polyhedral with twist	2	0.4			
			Polyhedral	2	0.4			
			Raspberry	1	0.2			
			Drawn	450	93.9			
			Wound	27	5.6			
			Unidentifiable	2	0.4			

* Includes dark-colored beads (63 black and 2 amethyst [purple])
** Includes light-colored beads (28 white, 3 oyster white, 14 light gray/colorless, 1 pale green, 6 pale blue).

Table 3. Characteristics of Glass Beads from Domestic Contexts at Townley-Read.

Townley-Read Glass Beads (1715-1754) Townley-Read/New Ganechstage Project Excavations, 1996-2000								
Color	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**	**Size**	**Count**	**% of Total**
White*	49	67.1	Circular	49	67.1	VS	5	6.8
Black	8	11.0	Round	19	26.0	S	43	58.9
Green	5	6.8	Oval	2	2.7	M	3	4.1
Blue	5	6.8	Faceted	2	2.7	L	7	9.6
Polychrome	3	4.1	Tubular	1	1.4	VL	15	20.5
Red	2	2.7						
Yellow	1	1.4						
			Drawn	62	84.9			
			Wound	11	15.1			

* Includes light-colored beads (41 white, 7 pale blue opal/alabaster, 1 lilac/nearly colorless).

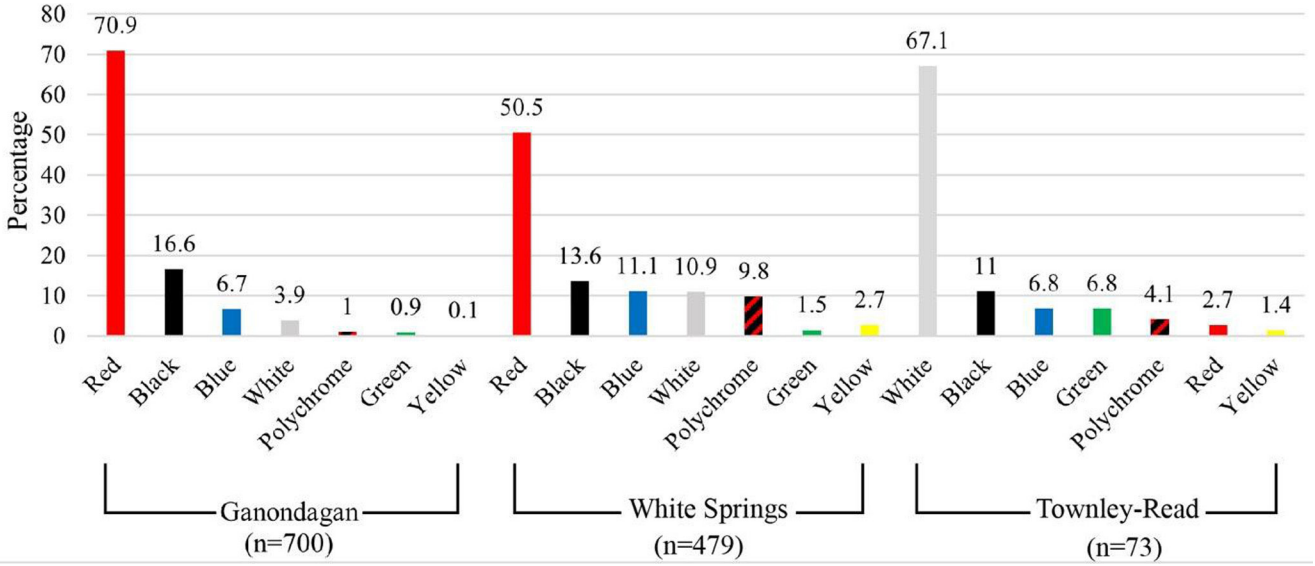

Figure 3. Glass bead colors represented in domestic assemblages at the Ganondagan, White Springs, and Townley-Read sites.

contributed to visually different styles of ornamentation over time. Dominant bead shapes shift between Ganondagan and White Springs, even as red continues to be the most popular color. In the Ganondagan assemblage, round is the most common shape and large is the most common size. The most common shape at White Springs is tubular, but round beads are also quite numerous. Wound beads become common at White Springs, with shapes such as round, oval, faceted, truncated teardrop, and raspberry. Drawn beads with polyhedral and polyhedral-twist shapes are also present at White Springs. The most common size in the White Springs assemblage is large, but small beads are just about as numerous. The White Springs assemblage demonstrates an increase in variety within the Seneca bead palette, involving greater diversity in color, shape, and surface decoration compared to the previous decades. Finally, the most common shape in the Townley-Read assemblage is circular, and the most common size is small. These small, circular beads are more numerous in the Townley-Read domestic assemblage compared to the other sites.

GLASS BEADS FROM OTHER HAUDENOSAUNEE SITES

Jordan (2008:176) writes, "the immediate Seneca response to Denonville was one of continuity rather than change." This is true regarding glass bead color preferences in the early years at White Springs, where a preference for red glass beads is maintained from Ganondagan, despite the Seneca community having to flee their town in advance of the French military incursion. Settlement relocation was not unique to the Seneca Nation; the other five (later six) Haudenosaunee Nations also relocated their settlements both by choice and through violent displacement. Specifically, other Haudenosaunee towns contemporary with both Ganondagan and White Springs were nucleated settlements in strategically defensible locations. During this time, allied Indigenous-Euroamerican military incursions into Haudenosaunee country contributed to the relocations of Haudenosaunee towns near the end of the 17th century (Jordan 2008:53). In the decades following the 1700-1701 peace treaties, as well as the Treaty of Utretcht, Haudenosaunee towns were increasingly not centralized within fortifications. During this time of relative peace, white was the most popular glass bead color at the Seneca Townley-Read site.

Seneca

Starting ca. 1550, the Seneca Nation maintained two principal towns, one eastern and one western, along with interconnected regional and extra-regional "satellite" communities (Jordan 2013; Richter 2011; Wray and Schoff 1953). The Marsh site (ca. 1655-1675) was an eastern Seneca town occupied immediately prior to Ganondagan. The western Seneca town sequence included Dann (ca. 1650-1670, contemporaneous with Marsh), Rochester Junction (ca. 1670/75-1687, contemporaneous with Ganondagan), Snyder-McClure (1688-1710/15, contemporaneous with White Springs), and Huntoon (1710/15-1740/45, contemporaneous with Townley-Read). Available glass bead data primarily comes from burial excavations conducted by Charles Wray and his contemporaries.[5]

Ryan and Dewbury (2010) examined a sample of 170 glass beads from Dann that were surface collected by the Frost family. Due to the comparability of the bead color and shape profiles from an assemblage surface collected by the Frost family at White Springs, I am confident the Dann Frost collection is similarly representative of the site's overall bead assemblage (LaGrasta 2021:38-39). In the Dann Frost collection, red is the most common color (71.8%), followed by black (9.4%), white (7.1%), blue (6.5%), polychrome (2.9%), and yellow (2.4%) (Table 4). The most common shape is tubular (77.6%), followed by round (15.9%), circular (5.9%), and oval (<1.0%). All the Dann beads are drawn. Bead sizes were not recorded.

Jordan (1996) examined and compiled unpublished field notes from Wray and other earlier researchers who excavated burials at Seneca sites dating ca. 1688-1754, including Snyder-McClure and Huntoon. The field notes on five Snyder-McClure burials report a total of 721 glass beads, plus 756 "large beads, different colors" for which a location has not been determined (Jordan 1996). Of the 721 glass beads, black is the most common color (42.0%), followed by unknown (34.0%), yellow (15.3%), white (3.6%), red (3.1%), and blue (2.1%) (Table 4). The most common shape is round (65.7%), followed by unknown (24.0%), faceted (6.9%), and tubular (3.3%). Ten percent of the Snyder-

Table 4. Characteristics of Glass Beads from Other Seneca Sites.

Seneca Glass Beads								
Dann (ca. 1655-1675) Derived from Ryan and Dewbury (2010)			**Snyder-McClure (1688-1710/15)** Derived from Jordan (1996)			**Huntoon (1710/15-1740/45)** Derived from Jordan (1996)		
Color	**Count**	**% of Total**	**Color**	**Count**	**% of Total**	**Color**	**Count ****	**% of Total**
Red	122	71.8	Black	303	42.0	White	13,099	70.8
Black	16	9.4	Unknown	245	34.0	Unknown***	5,058	27.4
White	12	7.1	Yellow	110	15.3	Black	201	1.1
Blue	11	6.5	White*	26	3.6	Blue	134	<1.0
Polychrome	5	2.9	Red	22	3.1			
Yellow	4	2.4	Blue	15	2.1			
Shape	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**	**Shape**	**Count ****	**% of Total**
Tubular	132	77.6	Round	474	65.7	Seed****	18,338	99.2
Round	27	15.9	Unknown	173	24.0	Round	95	<1.0
Circular	10	5.9	Faceted	50	6.9	Unknown	35	<1.0
Oval	1	<1.0	Tubular	24	3.3	Tubular	20	<1.0
						Oval	4	<1.0
Drawn	170	100.0	Drawn & Unknown	646	90.0	Drawn & Unknown	18,430	99.7
			Wound	75	10.0	Wound	62	<1.0
TOTAL	170		**TOTAL**	721		**TOTAL**	18,492	

* Includes light-colored beads (opalescent).
** Includes burials with excavators' estimated counts.
*** Includes unknown, white, blue, black, yellow, and green.
**** Seed is likely the same as circular.

McClure glass beads are likely wound based on Wray's descriptions, and the remaining 90.0% are either drawn or of unknown production. Bead size information was not recorded in detail. In addition to the field notes that Jordan examined, Schoff (1949:24-25) identified 819 glass beads from two burials at Snyder-McClure, but he does not provide further detail.

The field notes on the 20 Huntoon burial assemblages report 18,492 glass beads (Jordan 1996).[6] The most common color is white (70.8%), followed by unknown (27.4%), black (1.1%), and blue (<1.0%) (Table 4). "Seed" is the most common shape (99.2%). Others include round, tubular, oval, and unknown (<1.0% of the total assemblage). Bead size information is not available other than the "seed" designation, which is assumed to include very small, small, and medium beads.

Cayuga

Detailed published datasets on Cayuga archaeological glass bead assemblages come from DeOrio (1978) and Mandzy (1992). Discrepancies in site chronology, dating, and naming conventions are evident in both works.[7] According to Mandzy, the Mead Farm site (called "St. Joseph" by DeOrio) was the principal Cayuga town occupied from ca. 1656 to 1680. This community later relocated to Young Farm (ca. 1680-1710). Bead size information was not recorded by either author.

The Mead Farm (ca. 1656-1680) glass beads are derived primarily from burial excavations (Mandzy 1992:154). In this assemblage, red is the most common color (49.8%), followed by black (17.1%), white (14.1%), blue (6.9%), polychrome (4.6%), yellow (4.4%), and green (3.0%) (Table 5).[8] The most common shape is "seed" (37.9%), followed by tubular (37.9%), round (28.3%), oval (<1.0%), and twisted tubular (<1.0%).

The Young Farm glass beads were recovered by looting, surface collecting, and systematic excavation of both burials and a "village area" (Mandzy 1992:177). Red is the most common color (65.6%), followed by black (12.0%), blue (12.0%), white (6.9%), polychrome (2.9%), yellow (<1.0%), and green (<1.0%) (Table 5). The most common shape is tubular (65.4%), followed by round (27.8%), and "seed" (5.6%). Twisted tubular, wound faceted, oval, and corn shapes are also present (<1.0% each). Mandzy does not differentiate between drawn and wound beads, though it is likely the faceted and corn shapes are wound. The oval shape may be as well.

Onondaga

Bradley (2020) presents data on only the most frequently occurring Kidd and Kidd varieties at the Onondaga Indian Hill (ca. 1663-1682), Weston (ca. 1675-1696), and Jamesville (ca. 1696-1715) sites. The Indian Hill data represent 85.0%, the Weston data 88.0%, and the Jamesville data 71.0% of the total glass bead assemblages, respectively. This sampling strategy is not consistent with how data are presented elsewhere in this paper; it may skew the Onondaga data slightly regarding shape distributions and the proportions of "minority" colors like green, yellow, and polychrome. In addition, Bradley does not provide detailed data on size, but he observes "a trend toward small and very small beads" at both Weston and Jamesville (Bradley 2020:529).

The glass beads from both Indian Hill and Weston are from domestic contexts that were systematically excavated (*see* Sohrweide 2001 for Weston excavation information). In the Indian Hill bead sample, red is the most common color (86.0%), followed by black (11.2%), blue (1.8%), and yellow (1.0%) (Table 6). White beads are not represented. The most common shape is round (72.9%), followed by tubular (26.3%) and circular (<1.0%). Bradley does not report the presence of wound beads in the Indian Hill sample, so all beads are likely drawn. In the Weston sample, red is the most common color (52.4%), followed by black (37.5%), blue (7.5%), and white (2.6%) (Table 6). The most common shape is round (89.5%), followed by tubular (10.5%). Bradley (2020:443) does note the presence of some wound varieties in the Weston assemblage.

The glass beads from Jamesville were derived from surface collections, which may be from domestic and/or burial contexts. Most of the beads are red (51.0%), followed by black (21.0%), blue (11.4%), white (10.8%), polychrome (2.9%), and yellow (2.7%) (Table 6). Wound truncated-teardrop and faceted beads are among the most frequently occurring varieties in the Jamesville assemblage.

Oneida

Clark (2019) aggregates Oneida glass bead data from a variety of sources, including work by Bennett (1983, 1988) and Pratt (1961, 1983). Clark also supplied his own data by re-cataloging some collections. Detailed provenience information is not provided, but it is likely that some of Clark's data comes from burial contexts. He does not outline excavation methodologies for any site, but Bennett (1988) provides information on surface investigations and systematic excavations of the "occupation area" (likely domestic contexts) at Primes Hill. Bead size information is not provided.

Table 5. Characteristics of Glass Beads from Cayuga Sites.

Cayuga Glass Beads Derived from Mandzy (1992)					
Mead Farm (ca. 1656-1680)			**Young Farm (ca. 1680-1710)**		
Color	**Count**	**% of Total**	**Color**	**Count**	**% of Total**
Red	2290	49.8	Red	686	65.6
Black	786	17.1	Black	125	12.0
White*	648	14.1	Blue	125	12.0
Blue	317	6.9	White*	72	6.9
Polychrome	214	4.6	Polychrome	30	2.9
Yellow	210	4.4	Yellow	4	<1.0
Green	138	3.0	Green	3	<1.0
Shape	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**
Seed**	1746	37.9	Tubular	683	65.4
Tubular	1523	33.1	Round	290	27.8
Round	1302	28.3	Seed**	59	5.6
Oval	9	<1.0	Tubular with twist	6	<1.0
Tubular with twist	8	<1.0	Faceted***	4	<1.0
			Oval	2	<1.0
			Corn	1	<1.0
TOTAL	4603		**TOTAL**	1045	

* Includes light-colored beads (white, light grey, colorless).
** Seed is likely the same as circular
*** Mandzy describes "octagonal" or "8-sider" beads, which are likely faceted (wound).

In the Sullivan/Cukierski (ca. 1660-1677) bead assemblage, red is the most common color (75.8%), followed by black (12.1%), polychrome (6.7%), blue (2.8%), white (1.7%), yellow (<1.0%), and green (<1.0%) (Table 7).[9] The most common shape is round (62.4%), followed by tubular (36.7%), "seed" (<1.0%), and oval (<1.0%). Only drawn beads are present.

In the Upper Hogan (1687-1696) assemblage, red predominates (54.8%), followed by black (21.6%), blue (10.5%), polychrome (6.1%), white (4.4%), yellow (1.3%), and green (1.3%) (Table 7). The most common shape is round (51.8%), followed by tubular (38.1%), "seed" (8.0%), oval (1.7%), corn (<1.0%), and faceted (<1.0%). Only five wound beads are present (<1.0%), the remainder are drawn.

White beads (31.0%) dominate the Primes Hill (ca. 1696-1710) assemblage, followed by black (27.0%), blue (19.0%), red (15.1%), green (4.8%), and polychrome (3.2%) (Table 7). Round is the most common shape, followed by faceted (15.1%), tubular (7.9%), "seed" (2.4%), oval (2.4%), donut (<1.0%), and flat disk (<1.0%). Drawn beads comprise 69.8% of the assemblage, but wound beads are also quite numerous (30.2%).

The dominance of white beads (49.6%) continues at Lanz-Hogan (1725-1750), and the proportion of red beads further declines. After white, green (24.3%) is the most common color, followed by yellow (10.4%), blue (10.0%), red (4.3%), black (1.3%), and polychrome (<1.0%) (Table 7). "Seed" beads (99.2%) make up most of the assemblage, though this category likely includes mostly round and

Table 6. Characteristics of Glass Beads from Onondaga Sites.

Onondaga Glass Beads Derived from Bradley (2020)*								
Indian Hill (ca. 1663-1682)			**Weston (ca. 1675-1696)**			**Jamesville (ca. 1696-1715)**		
Color	**Count**	**% of Total**	**Color**	**Count**	**% of Total**	**Color**	**Count**	**% of Total**
Red	2319	86.0	Red	645	52.4	Red	497	51.1
Black	302	11.2	Black	462	37.5	Black	205	21.1
Blue	48	1.8	Blue	92	7.5	Blue	111	11.4
Yellow	28	1.0	White	32	2.6	White**	105	10.8
						Polychrome	28	2.9
						Yellow	26	2.7
Shape	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**
Round	1965	72.9	Round	1102	89.5	Round***	640	65.8
Tubular	708	26.3	Tubular	129	10.5	Tubular	282	29.0
Circular	24	<1.0				Truncated teardrop	26	2.7
						Faceted	24	2.5
Drawn	2697	100.0	Drawn	1231	100.0	Drawn	922	94.9
			Wound	present		Wound	50	5.1
TOTAL	2697		**TOTAL**	1231		**TOTAL**	972	

* Bradley (2020) presents data on only the most frequently occurring Kidd and Kidd varieties at these sites.
** Includes light-colored beads (white, light grey, colorless).
*** Bradley groups round, oval, "elongated," and "flat" bead shapes together in his presentation for Jamesville.

circular beads. Other shapes include (<1.0% total) faceted, round, donut, oval, tubular, and flat disc with inlay. Most Lanz-Hogan beads are drawn (99.4%), but wound beads (<1.0%) are present. Clark also reports one round, blown glass bead.

Mohawk

Rumrill (1991) reports on Mohawk glass bead assemblages and Snow (1995) expands upon and clarifies much of this data. Snow outlines survey and recovery methodologies for each site: Fox Farm (ca. 1666-1679) was excavated by avocational archaeologists; domestic contexts from Caughnawaga (ca. 1679-1693) were systematically excavated; Milton Smith (ca. 1693-1712) was systematically surveyed, but not excavated; and Auriesville has not been surveyed but parts have been excavated, including cemeteries.[10] Therefore, the glass bead assemblages from all but Caughnawaga may consist of beads from both domestic and burial contexts. Bead sizes were not recorded by either author.

In the Fox Farm assemblage, red predominates (92.4%), followed by black (5.4%), blue (1.1%), and polychrome (1.1%) (Table 8). No white beads are present. The most common shape is circular (51.1%), followed by round (43.5%) and oval (5.4%). All Fox Farm beads are drawn. Rumrill (1991:34-35) and Snow (1995) also point out that red beads were just as common at the White Orchard and Schenck sites, which were occupied by Mohawk communities at the same time as Fox Farm. The Fox Farm community later relocated to Caughnawaga. In that assemblage, black is the most common color (88.3%), followed by red (5.5%), blue (4.1%), white (1.0%), yellow

Table 7. Characteristics of Glass Beads from Oneida Sites.

Oneida Glass Beads Derived from Clark (2019)											
Sullivan/Cukierski (ca. 1660-1677)			**Upper Hogan** (ca. 1687-1696)			**Primes Hill** (ca. 1696-1710)			**Lanz-Hogan** (1725-1750)		
Color	**Count**	**% of Total**	**Color**	**Count**	**% of Total**	**Color**	**Count**	**% of Total**	**Color**	**Count**	**% of Total**
Red	2311	75.8	Red	743	54.8	White*	39	31.0	White*	6272	49.6
Black	369	12.1	Black	293	21.6	Black**	34	27.0	Green	3075	24.3
Poly-chrome	205	6.7	Blue	143	10.5	Blue	24	19.0	Yellow	1314	10.4
Blue	85	2.8	Poly-chrome	83	6.1	Red	19	15.1	Blue	1262	10.0
White*	53	1.7	White	60	4.4	Green	6	4.8	Red	538	4.3
Yellow	16	<1.0	Green	17	1.3	Poly-chrome	4	3.2	Black**	170	1.3
Green	8	<1.0	Yellow	17	1.3				Poly-chrome	10	<1.0
Shape	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**
Round	1902	62.4	Round	702	51.8	Round	89	70.6	Seed***	12,541	99.2
Tubular	1117	36.7	Tubular	516	38.1	Faceted	19	15.1	Faceted	53	<1.0
Seed***	22	<1.0	Seed***	109	8.0	Tubular	10	7.9	Round	23	<1.0
Oval	6	<1.0	Oval	23	1.7	Seed***	3	2.4	Donut	13	<1.0
			Corn	5	<1.0	Oval	3	2.4	Oval	5	<1.0
			Faceted	1	<1.0	Donut	1	<1.0	Tubular	4	<1.0
						Flat disk	1	<1.0	Flat disk w/ inlay	2	<1.0
Drawn	3047	100.0	Drawn	1351	99.6	Drawn	88	69.8	Drawn	12,560	99.4
Wound			Wound	5	<1.0	Wound	38	30.2	Wound	78	<1.0
									Blown	3	<1.0
TOTAL	3047		TOTAL	1356		TOTAL	126		TOTAL	12,641	

* Includes light-colored beads (white, light grey, colorless).
** Includes dark-colored beads (purple/"amethyst" and brown/"cinnamon").
*** Seed is likely the same as circular.

(<1.0%), and green (<1.0%) (Table 8). The most common shape is round (98.5%); other shapes include truncated cone, corn, tubular, and circular (<1.0% each). Most beads are drawn (98.9%), but a few wound beads are present (1.1%).

In 1693, Count Louis de Frontenac and his army "pillaged and burned" Caughnawaga, which scattered the Mohawk Nation over multiple settlements (Rumrill 1991:35-37). Milton Smith was likely occupied by Catholic

Table 8. Characteristics of Glass Beads from Mohawk Sites.

Mohawk Glass Beads Derived from Rumrill (1991) and Snow (1995)											
Fox Farm (ca. 1666-1679)			**Caughnawaga** (ca. 1679-1693)			**Milton Smith** (ca. 1693-1712)			**Auriesville** (ca. 1693-1712 / 1712-1750)		
Color	**Count**	**% of Total**	**Color**	**Count**	**% of Total**	**Color**	**Count**	**% of Total**	**Color**	**Count**	**% of Total**
Red	85	92.4	Black	639	88.3	Black	17	37.8	White*	45	47.9
Black	5	5.4	Red	40	5.5	Red	12	26.7	Blue	26	27.7
Blue	1	1.1	Blue	30	4.1	White	7	15.6	Yellow	13	13.8
Poly-chrome	1	1.1	White	7	1.0	Blue	4	8.9	Poly-chrome	9	9.6
			Yellow	5	<1.0	Poly-chrome	3	6.7	Black**	1	1.1
			Green	3	<1.0	Yellow	2	4.4			
Shape	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**	**Shape**	**Count**	**% of Total**
Circular	47	51.1	Round	713	98.5	Round	17	38.0	Faceted	30	32.0
Round	40	43.5	Truncated cone	5	<1.0	Tubular	13	29.0	Circular	28	30.0
Oval	5	5.4	Corn	3	<1.0	Circular	13	29.0	Raspberry	16	17.0
			Tubular	2	<1.0	Truncated cone	2	4.0	Round	13	14.0
			Circular	1	<1.0				Oval	7	7.0
Drawn	92	100.0	Drawn	716	98.9	Drawn	43	95.5	Wound	56	60.0
			Wound	8	1.1	Wound	2	4.4	Drawn	38	40.0
TOTAL	92		**TOTAL**	724		**TOTAL**	45		**TOTAL**	94	

* Includes light-colored beads (white, light grey, pale blue/opalescent or alabaster).
** Includes dark-colored beads (brown/ "cinnamon"), but no actual black beads.

Mohawk people from Caughnawaga immediately after Frontenac's campaign (ca. 1693-1712) (Rumrill 1991:38-41; Snow 1995:454). The bead assemblage from Milton Smith is small (n=56), but black beads continue to be the most common (37.8%), followed by red (26.7%), white (15.6%), blue (8.9%), polychrome (6.7%), and yellow (4.4%) (Table 8). Round is the most common shape (38.0%), followed by tubular (29.0%), circular (29.0%), and truncated cone (4.0%). Most beads are drawn (95.5%), the rest are wound.

Rumrill dates Auriesville to ca. 1712-1750, but Snow (1995:451-455) argues the site could have been occupied earlier by a group of Mohawk people from Caughnawaga ca. 1693-1712 or occupied short-term ca. 1700-1712. Rumrill (1991:41) argues the Auriesville assemblage is characteristic of the early 18th century, and my comparative analysis supports this assertion. White beads are the most common (47.9%), followed by blue (27.7%), yellow (13.8%), polychrome (9.6%), and black (1.1%) (Table 8). No red beads are present. The most common shape is faceted (32.0%), followed by circular (30.0%), raspberry (17.0%), round (14.0%), and oval (7.0%). Wound beads dominate the assemblage (60.0%).

Summary of Haudenosaunee Glass Bead Trends

Across nearly all Haudenosaunee contexts, red is the most common glass bead color, followed by black, from at least the 1650s until about 1700. However, there are two notable "breaks" with this pattern. First, the Seneca Snyder-McClure (ca. 1688-1710/15) collection is dominated by black beads, and red beads make up just 3.1% of the assemblage. Though 34% of the Snyder-McClure beads are of "unknown" colors, even if all these beads are red, black beads would still outnumber red in the assemblage. However, Herlich (2008) notes potentially significant individual variation in the colors of glass beads in burials. Jordan (1996) documents just five burials, so it is possible that the small sample size impacts the colors represented in the Snyder-McClure collection.[11] Further research on the beads from Snyder-McClure is therefore warranted. Second, in the Mohawk Caughnawaga (ca. 1679-1693) and Milton Smith (ca. 1693-1712) bead assemblages, black is the most common color, rather than red. The shift from red to black is stark between Mohawk Fox Farm and Caughnawaga, whereas changes in color preferences in the eastern Seneca sequence, and Cayuga, Onondaga, and Oneida contexts, occur more gradually. The Caughnawaga beads are a large assemblage that was systematically excavated, so I have confidence this sample is representative of the beads used during the site's occupation. Therefore, the high proportion of black beads at Caughnawaga suggests that black was either preferred by Mohawks, not having as much access to red beads as the other four nations at that time, or they had access to another type of red-colored material to use for adornment instead of red glass.[12]

After the turn of the 18th century, white becomes the most common bead color across the Haudenosaunee Confederacy. The increase in white beads in the Primes Hill assemblage (ca. 1696-1710) may suggest that an increase in white beads occurred in the Seneca country during the latter portion of the White Springs occupation, rather than with the Seneca community's transition to living at Townley-Read. At the Seneca Townley-Read and Huntoon, the Oneida Lanz-Hogan, and the Mohawk Auriesville sites, white is the most common bead color.

Though glass bead color patterns are quite consistent across the Haudenosaunee Confederacy (except for Snyder-McClure and the two Mohawk sites), there is considerably more variation in bead shape patterns. At Dann (Seneca), tubular beads are the most common. At Ganondagan (Seneca), Indian Hill (Onondaga), and Sullivan/Cukierski (Oneida), round is overwhelmingly the most common shape. However, at the same time at Mead Farm (Cayuga), seed is the most common shape and at Fox Farm (Mohawk), circular is most common.

Haudenosaunee sites contemporary with White Springs (Seneca) generally have more diversity in bead color and shape with the appearance of wound varieties such as truncated teardrop, raspberry, corn, and faceted. However, while Mohawks, Oneidas, and Onondagas may have preferred round beads at this time, Cayugas and Senecas apparently preferred tubular beads.[13] Seed beads are popular at Townley-Read and Huntoon (both Seneca), as well as Lanz-Hogan (Oneida). Wound faceted beads are the most common shape at Auriesville (Mohawk), but circular beads are nearly as common.

No glass bead data are available for contemporaneous Cayuga or Onondaga sites. Wound beads become more common over time in Haudenosaunee contexts, and the increase in their numbers coincides with the increase in white beads around the turn of the 18th century. The lone wound bead variety found at Ganondagan – an amber truncated teardrop (variety WIi*) – is also present at White Springs (n=9), Onondaga Weston (count not reported; designated WIb2 in Bradley [2020:443]), Caughnawaga (n=5, called "truncated cone," WIe* in Rumrill's Table 25 and Snow's Table 11.3), and Milton Smith (n=2). This suggests the truncated-teardrop form may have been worn at Ganondagan in the later years of its occupation. This variety is not observed at Haudenosaunee sites contemporary with Townley-Read, indicating that it is a potential horizon marker for the 1670s-1690s.

Another possible wound horizon marker is the pentagonal-faceted type (WIIc). My research clarifies Wray's (1983) and Bennett's (1983) longtime claim that such beads appear at Haudenosaunee sites beginning in the late 1680s-1690s. Clark (2019:53) also makes this observation from his empirical analysis of Oneida glass bead assemblages, dating the "wire-wound phase" to 1690-1785. Faceted wound beads are present on all Five Nations sites occupied during the last two decades of the 17th century.[14] However, the presence of faceted wound varieties at Oneida Primes Hill (ca. 1696-1710) but not at Upper Hogan (1687-1696), and at Onondaga Jamesville (1696-1715) but not at Weston (1675-1696), provides a tighter time frame, indicating this shape became more common around the turn of the 18th century.

The similar color and distinct shape preferences across the Five Nations during this time likely yielded visually distinct beadwork between nations. Differences in bead shape provide evidence for deliberate selection on the part of the Haudenosaunee people. The aesthetic characteristics of these glass bead assemblages are the result of strategic choices the Haudenosaunee made as willing participants in the fur trade, rather than a reflection of the bead supply that was generally available from European merchants.

CONCLUSION

The dynamic visual characteristics evident in glass bead assemblages over time demonstrate that Haudenosaunee people intentionally sought certain colors, patterns, shapes, and sizes of glass beads and buttons. I propose that Haudenosaunee people of the 17th-18th centuries valued whiteness and reflectiveness of glass beads for their associations with animacy and positive states of well-being, including peace, health, and wealth. Redness was valued for its potency related to life-giving (or life-taking) aspects such as blood, berries, and fire. Though Hamell (1992) argues black is valued for its ability to communicate feelings of mourning related to conflict and death, it is apparent that blackness is more nuanced. The Great Black Door and the False Face ceremony exemplify the transformational qualities of black as a threshold. Further, the low numbers of yellow beads in the assemblages may not indicate a Haudenosaunee distaste for yellow, but perhaps a reverence for it due to the color's association with the sun and the sunflower.

Moreover, the White Dog Sacrifice and the False Face Ceremony demonstrate how social actors – both human and other-than-human – interact with one another to maintain social balance through collective processes of transformation. As such, the colors white, red, black, and yellow have a complex interrelationship between one another and with humans in the context of Haudenosaunee society.

The glass bead assemblages from three Seneca sites dating 1670-1754 indicate Seneca people preferred red, black, and white beads for ornamentation during this time. The popularity of red beads at Ganondagan (ca. 1670-1687), and White Springs (ca. 1688-1715) likely extended even earlier, as red was the most common bead color in the Dann assemblage (ca. 1650-1670). Though black beads are not as common in the Ganondagan and White Springs assemblages as red beads, they are still the second most popular color. I observe a shift in preference from red to white beads between White Springs and Townley-Read (ca. 1715-1754).

Comparative analysis of glass bead assemblages from contemporaneous Five Nations towns suggests dynamism of color preference is consistent across the Haudenosaunee Confederacy. My analysis indicates the shift from red to white beads occurred around the turn of the 18th century, rather than coinciding with the Seneca community's relocation from White Springs to Townley-Read. This study also demonstrates that while Haudenosaunee beadwork of the 17th-18th centuries may look similar in terms of color, nation-specific shape preferences would have resulted in aesthetic differences. For instance, while the Seneca community was in residence at Ganondagan, they and Onondagas and Oneidas were wearing mostly round beads, whereas Cayugas preferred tubular beads and Mohawks preferred circular beads. This likely yielded visually distinct beadwork between nations.

That the Five Nations had similar preferences for color and distinct preferences for shape appears to demonstrate that they were not simply trading for what was generally available from European merchants. As actors with agency, Haudenosaunee Nations intentionally sought out specific visual characteristics of glass beads to generate desired outcomes. In turn, European supply in the 17th-18th centuries may not have been solely driving the glass bead market in the Haudenosaunee context. The lack of yellow beads at the sites examined in this article may not necessarily be because the color was undesirable to Haudenosaunee people; rather, it could be so potent and special that its use needed to be regulated by the communities. In fact, excavations at the Sonnenschlag and Genenbach glassworks in Upper Austria revealed many amber-colored (yellow) beads, which date to the early years of the 18th century (Tarcsay 2020), indicating that supply may not have been the limiting factor. Since these glassworks were primarily making beads for global export, the amber beads may have been destined for another part of the world if there was not a market in the Haudenosaunee Confederacy.

There were also differences in glass bead color preferences in North American Indigenous communities outside Haudenosaunee territory. Red and black beads dominate late-17th-century Algonkian-speaking Piscataway sites of the Chesapeake region; Piscataway people had similar aesthetic and ideological understandings of red, black, and white (Webster and King 2018; Williamson 2003). Like the Haudenosaunee Confederacy, Piscataways also traded and undertook diplomacy with the English and French during this time (Webster and King 2018), though Haudenosaunee people were also trading directly with the Dutch. In the Great Lakes region, the Iroquoian-speaking Neutral Confederacy, also trading with the French and the Dutch, demonstrated aesthetic and ideological preferences for red beads (Kenyon 1982), though most research on the Great Lakes bead trade is focused on the first half of the 17th century. However, during most of the 17th century in the Southeast, Creek and Guale communities (both Muskhogean-speaking) demonstrated aesthetic and ideological preferences for blue glass beads, and they primarily traded with the Spanish (Blair et al. 2009; Pluckhahn 1996). The question of how global glass bead supply and demand influenced individual site assemblages deserves further inquiry.

The dynamics of aesthetic preferences signal Haudenosaunee motivations for utilizing particular colors

in times of conflict and other colors in times of peace. The popularity of red glass beads during the second half of the 17th century implies Haudenosaunee people sought them for their animate, sustaining, and protective qualities during a time when warfare was frequent. During this period, black was generally the second most popular bead color. To mitigate this difficult time, Haudenosaunee people may have chosen red beads alongside black ones to serve as conduits for transformation into more stable and peaceful circumstances. Just before the turn of the 18th century, white becomes the most common bead color, and red beads make up a considerably smaller proportion of bead assemblages. This white shift roughly coincides with peace treaties signed between the Haudenosaunee Confederacy, New France, New York, and western Indigenous Nations in 1700-1701 (Brandão and Starna 1996; Parmenter 2010). Jordan (2008:57-63) describes how the first decade of the 18th century continued to be violent for the Seneca Nation, so the popularity of white beads may reflect hope for peace. Turgeon (2001:95) points out that white was also a popular bead color early in Haudenosaunee-European interaction, which "may have corresponded to an expression of hope for better well-being through the encounter with Europeans." Perhaps the same sense of optimism and hope for peace was also felt over a hundred years later and articulated through Haudenosaunee demand for white beads to be used for adornment worn in daily life.

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ENDNOTES

1. Hodinöhsö:ni' is the Seneca spelling of Haudenosaunee (People of the Longhouse). The Haudenosaunee Confederacy presently consists of the Mohawk (Kanien'kehá:ka), Oneida (OnΛyota'a•ka), Onondaga (Ononda'géga'), Cayuga (Gayogo hó:no?), Seneca (Onöndowa'ga:'), and Tuscarora (Skarù·rę?) nations.

2. Diasporic Haudenosaunee communities are in other states as well, including Wisconsin, Oklahoma, and North Carolina. Additionally, Haudenosaunee people traveled through and resided in other lands outside their homelands for hunting, battle, and trade. The Tuscarora Nation arrived in what is now New York state in 1713 from what is now North Carolina. They were "welcomed home" into the Haudenosaunee Confederacy in 1722, during the time that Townley-Read was occupied by the eastern Seneca community.

3. There is variation in False Face mask decoration and associations between color and cardinal directions within the Five Nations, and even between Seneca communities at Allegany, Tonawanda, and Cattaraugus. Fenton (1987) describes these differences at length.

4. Jordan (2008:159) analyzed this same assemblage. My analysis differs slightly from his because he did not have access to the *Munsell Bead Color Book* (2012).

5. Wray (1985:112) reports that 132,980 glass beads from Seneca sites occupied ca. 1600-1687 are housed at the Rochester Museum and Science Center. Over 45,000 glass beads from Wray's burial excavations at Dann and Marsh are also housed at the RMSC (Wray 1983:44) and over 18,000 additional shell and glass beads collected from the surface of Dann may be in private collections (Wray 1985:110-111).

6. This number is primarily based on the excavators' estimates and does not represent exact counts. Jordan (1996) also notes that some burials contained glass beads, but their counts were not reported. The index numbers of burials that have glass beads but do not have glass bead counts: #3002 (white seed), #3005 (unknown), #3006 (white seed), #3013 (blue and white tubular, white seed), #3015 (blue, white, black, green

seed), #3501 (white, blue, green seed), #3502 (color unknown, seed). Notably, no red beads were recorded in these burials.

7. The "Mead Farm" site (ca. 1656-1680) that Mandzy discusses is the same site as DeOrio's "Mission Period" St. Joseph (ca. 1650-1680). Mandzy's (1992:10) Paddington site is the same as the Watkins site described by DeOrio, which is roughly contemporaneous with Townley-Read (Kurt Jordan 2021: pers. comm.). Mandzy does not describe the glass bead assemblages from Paddington and a later site he calls Watkins. Excavation of Paddington/Pattington by Ithaca College students and faculty recovered fewer than 10 glass beads (Jordan et al. n.d.). Therefore, no discussion of Cayuga sites contemporary with Townley-Read can be included in this analysis.

8. Mandzy did not use either the *Munsell Bead Color Book* or Kidd and Kidd designations in his data analysis and presentation, but I was still able to assess general bead color and shape information based on his descriptions of each assemblage.

9. Some of the counts in Table 7 differ slightly from what Clark reports in that he reported broken beads as 0.5 count, whereas I counted them as one bead.

10. Rumrill calls Auriesville "Auriesville Shrine," but Snow distinguishes between Auriesville #1, #2, and #3. The #3 site is a cemetery, whereas #1 and #2 are likely domestic areas. The glass bead data for Auriesville outlined in Rumrill, Snow, and Table 8 here is from Auriesville #1 and #2.

11. This argument could also be made for the Mead Farm (Cayuga) glass bead assemblage. During the time Ganondagan was occupied, red beads make up 70% or more of eastern and western Seneca, Onondaga, Oneida, and Mohawk bead assemblages, but just 49.8% of the Mead Farm beads are red. About half (n=2391) of the Mead Farm assemblage apparently comes from just two individual burials, and the other half (n=2212) are unprovenienced (Mandzy 1992:155-156, 158). Much of Mead Farm has been looted over time (Mandzy 1992:153), which may have further impacted Mandzy's artifact sample.

12. Though this article specifically focuses on color analysis of *glass* beads, Hamell (1992:461) is clear that color analysis should include *all* types of beads (shell, stone, metal, and glass). Earlier observations have been made about the relationship between white glass beads and white shell beads (Hamell 1992:461; Sempowski 1989). A cross-material color analysis could clarify reasons for the proliferation of black glass beads on Mohawk sites, as it may be balanced by an increased use of red stone beads. Perhaps Mohawks had access to red stone earlier than the other nations due to their geographic position near the source of red slate (the present-day New York-Vermont border) and/or changes to their trading relationship with the English that forced Mohawks to acquire catlinite/red pipestone beads via trade from the Great Lakes region (Snow 1995:449, 458-459). An increase in red stone beads is also observed at other Five Nations sites after the turn of the 18th century. DeOrio (1978:3-6) observes that red stone artifacts were "at the height of popularity" from 1710 to 1740 at the Cayuga Watkins site when red glass beads were no longer "dominant." Jordan and Gerard-Little (2019:53) observe fluctuations in the amount of red slate, catlinite (from the Great Lakes area), manufacturing debris, and finished objects in the Seneca Ganondagan/White Springs/Townley-Read site sequence. Notably, Jordan and Gerard-Little (2019:53) write that while red glass beads were scant in both domestic and burial contexts at Townley-Read, the use of red stone "went up dramatically." Moreover, at the Onondaga Weston site, Bradley (2020:459-460) observes a noticeable increase in red pipestone, which he argues is related to diplomacy with Ottawas.

13. The most common shape in the Snyder-McClure assemblage is round (65.7%), but 24.0% of the shapes are undetermined. This is different from what is observed at White Springs, at which tubular beads seem to have been preferred. This could be due to different eastern vs. western Seneca shape preferences. However, the Snyder-McClure data is not complete, so this interpretation could use further assessment.

14. Clark (2019) also identifies faceted wound beads at the Oneida Cameron site, which he dates to ca. 1590-1615. Faceted wound beads are then not found in another Oneida assemblage until Primes Hill (ca. 1696-1710). This suggests that the presence of faceted wound beads at Cameron may be due to attribution or collection problems, or from later Oneida activities at the Cameron site. Faceted beads are also present at Cayuga RMBH (ca. 1670?-1687), but the dating of this site is inexact. Mandzy also did not use the Kidd and Kidd typology in his analysis, so my assessment of bead shape is based solely on his descriptions.

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A NEW VARIETY OF FRIT-CORE BEAD FROM JAMESTOWN, VIRGINIA

Emma Derry

The inventory of frit-core beads continues to grow with the finding of a new variation of Type 9 at Jamestown (1607-ca. 1699) in eastern Virginia, the first permanent English settlement in the Americas. It is decorated with four golden yellow and four raised white stripes.

A newly identified frit-core bead (Figures 1-3) from Jamestown, Virginia, represents a variation of the recently described Type 9 (Karklins 2020). The bead is dark navy blue, almost black, with distinct flecks of blue, white, and grey visible with magnification. The core consists of what appears to be crushed quartz fused in a brown matrix (Figure 4). Decoration consists of eight raised longitudinal stripes of alternating white and golden yellow. With magnification, brick-red inclusions can be seen in the yellow. The previously described Type 9 variety only has four white stripes alternating with four low lobes. The Jamestown bead was originally oval in shape, but broke at an oblique angle to the perforation. The remaining section has a maximum length of 13.0 mm and a diameter of 13.5 mm excluding the raised decoration and 15.3 mm including it. The perforation is 2.4 mm in diameter and exhibits a distinct green stain suggesting it was originally strung on either a copper-alloy wire or link.

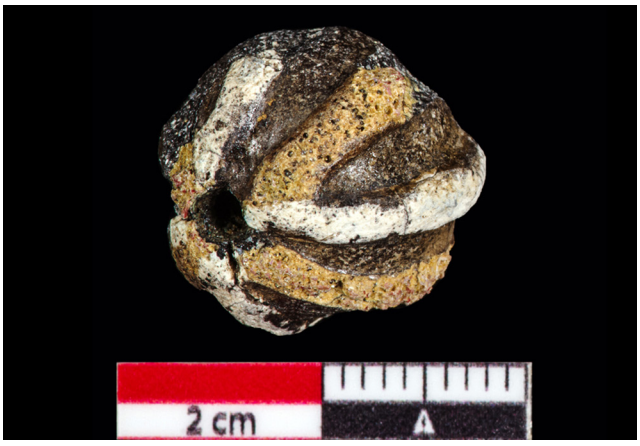

Figure 1. End view of the Jamestown bead (all photos by Charles Durfor, courtesy of Jamestown Rediscovery/Preservation Virginia).

Figure 2. Side view of the Jamestown bead.

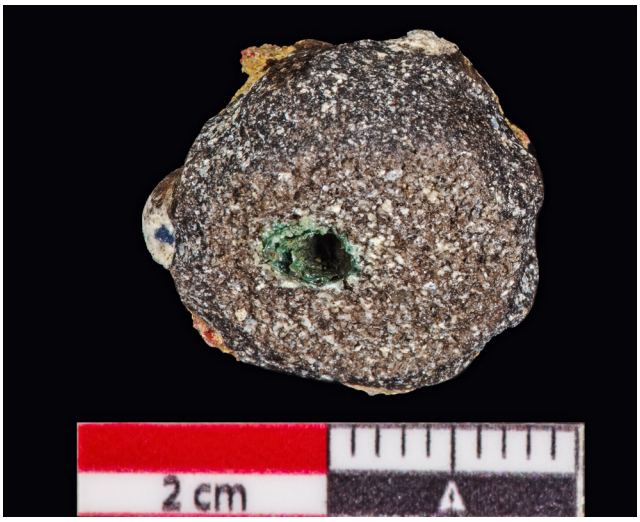

Figure 3. The broken end showing the speckled nature of the core material.

The only other frit-core bead (Type 4A; Figure 5) found at Jamestown was excavated from a tightly dated well dug in 1608 and filled in a distinct episode in 1610 (Derry 2019:41), helping to expand the known date range of frit-core beads

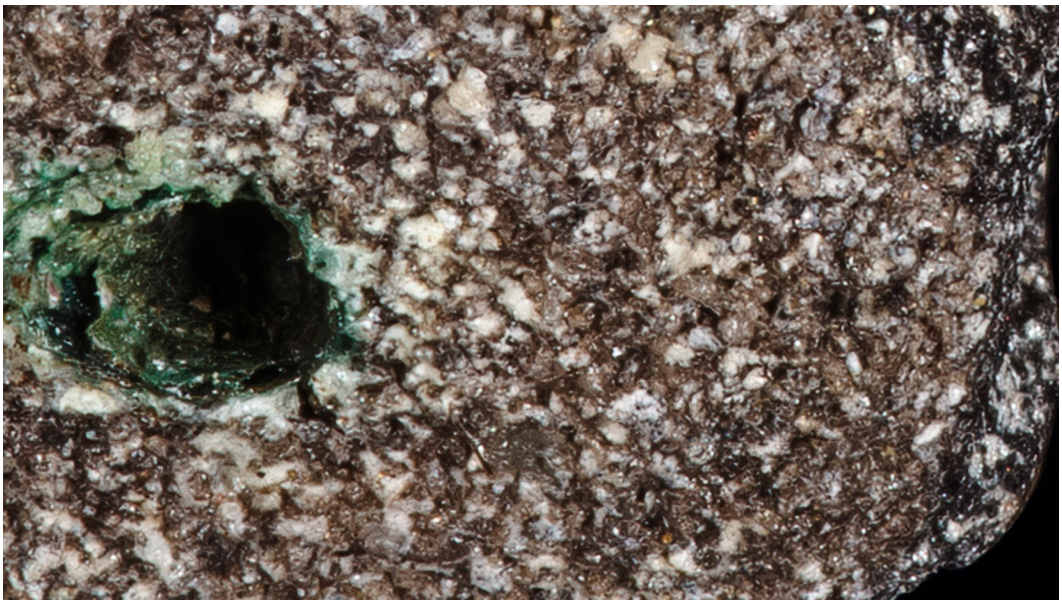

Figure 4. Closeup of the core components.

to include the early 17th century (Karklins 2016). The new specimen, on the other hand, was recovered from a plowzone layer within the boundary of the original 1607 palisade of James Fort, near the west bulwark. In addition to plowing, this area of the fort was disturbed by the construction of Confederate Fort Pocahontas in 1861. Many 17th-century artifacts were displaced from their original contexts during the construction of the earthworks, but features preserved in deeper layers still revealed evidence of the earliest years of the first permanent English settlement in the Americas.

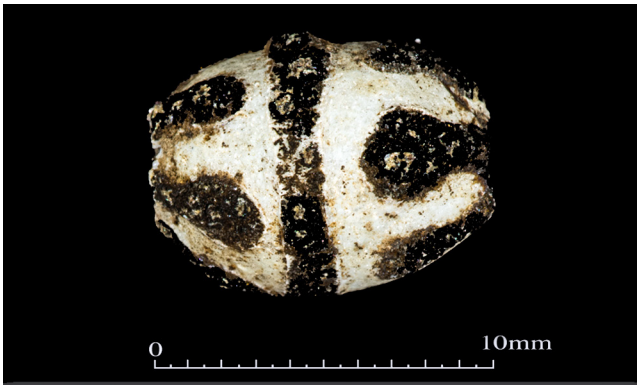

Figure 5. The Type 4A frit-core bead from Jamestown.

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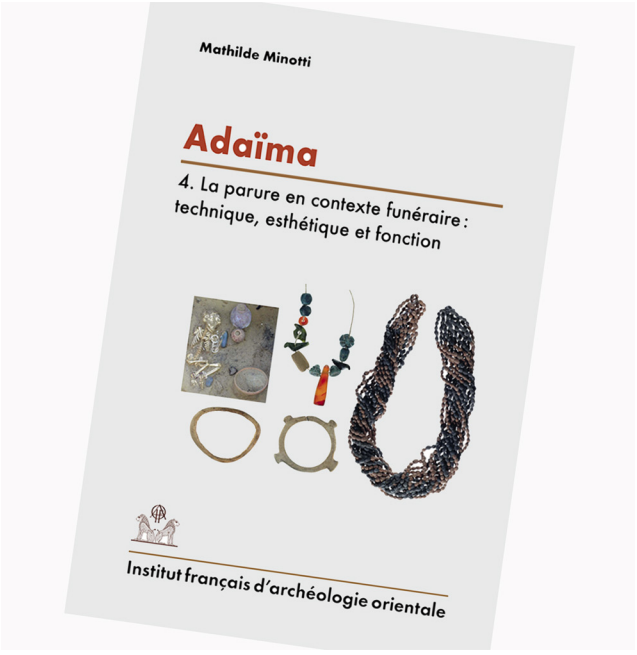
BOOK REVIEWS

Adaïma IV. La parure en contexte funéraire : technique, esthétique et fonction.

Minotti, Mathilde. Fouilles de l'Institut français d'archéologie orientale 88. 2 vols. 2021. xiii + 520 pp., 514 color figs. ISBN: 978-2-7247-0777-9. 48 € (paper), 33 € (pdf).

Sources of information about the structuring of individual and social identities are rare in pre-literate societies, so cemeteries with personal ornaments are a precious resource for researchers. As personal ornaments in their many guises have rarely received equitable treatment in the final publications of excavation projects, it is encouraging to see this two-volume set (text and appendix), by Mathilde Minotti, as the fourth in the Adaïma monograph series. Minotti's book and catalogue describe and evaluate the ornaments of the various cemetery areas and phases at the Predynastic (4th millennium BCE) site of Adaïma in the Nile Valley. The book aims to consider not only the metric and material aspects of the artifacts, but also delves further into the materiality and human relationships revealed by ornaments deposited in graves, considering their contextual role as part of death rituals.



Volume 1 starts with excellent points about the role of personal ornaments in archaeology, answering the general negative prejudices relating to their study and interpretation in the academic sphere. The dynamic relationship between living ornamentation and ornaments for the dead is a fundamental and often neglected part of ornament research that is highlighted both here and throughout the work. The main text is divided into five chapters bracketed by an introduction and conclusion. The introduction to the site gives vital background for those not familiar with the region or period. Adaïma is important for its occupation during the increasingly complex Neolithic/Bronze Age transition and the artifacts are contextually significant because of their location in graves which are informative about many aspects of use and social life.

Over the following four chapters, the ornaments are presented starting with typology and life cycles, followed by materials and manufacture, aesthetics, and finally, the function of ornaments in the funerary sphere, together characterized by the author as a "holistic" approach. The presentation of the ornaments throughout the book is smoothed by a logical and easy-to-understand approach to typological classification accompanied by clear diagrams which will facilitate comparative work by others in the future. Criticisms of existing inherently interpretive terminologies are well placed, and Minotti provides clear, if somewhat complex, neutral alternatives which she uses consistently throughout.

Beyond basic identifications, materials are characterized according to their wider use. Those used only for ornaments and those also exploited in the production of other artifacts are used to identify both possible procurement strategies and the exploitation of different source areas according to need. Thinking about the nature of procurement sheds light on opportunism, choice, value, and ties to different and apparently unrelated areas of procurement, offering a fascinating insight into where ornaments may have fit in the wider activities and contacts of the community.

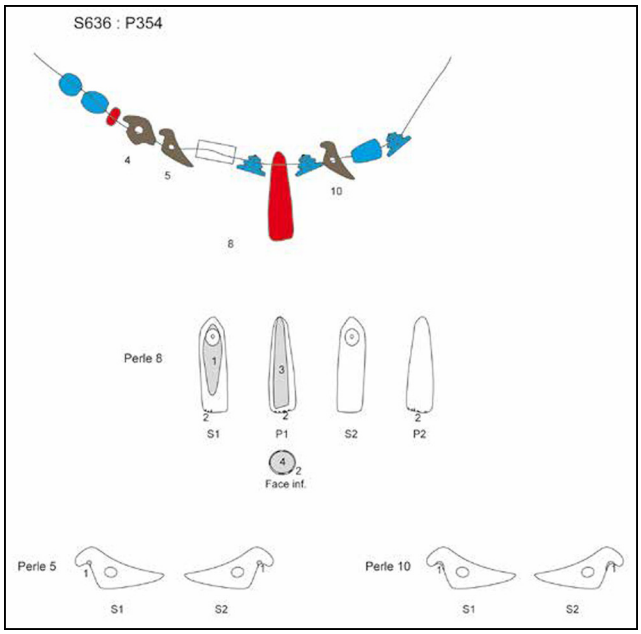
Emphasis is placed throughout on the color of ornaments, centering aesthetics – in the sense of impression created by the ornaments – in the interpretive framework and relating color and form strongly to the human body. Given

our limited understanding of the economic and social values attributed to materials, this is a useful different perspective on the human/ornament relationship. This relationship is further investigated through use-wear. Within complex archaeological assemblages involving multiple materials and many forms, this is a complicated task, which may be why many researchers avoid the subject. Here, use-wear in some materials is investigated using a limited range of techniques, offering some insight into how various materials may have been utilized. Of course, to fully explore and give this subject the attention it deserves would require a second book and years of further experimentation; however, the potential for further work is emphasized.

The use of ornaments on the body, whether in life or death, is a major element of contextual study that is often lacking in archaeological work either because of a lack of data or poor preservation of the contexts. Here the author exploits the data to its maximum potential to investigate not only the positioning of different ornaments on the body, but also the relationship between mode of use, color, and material to understand the visual effect of each object (Chapter 4). In combination with the wider contextual, skeletal, temporal, and spatial assessments, this gives a good idea of by whom, where, and when different ornaments were used in death. The distribution of artifacts throughout the wider cemetery provides insight into temporo-spatial human ornament relationships at the site (Chapter 5). In conjunction with use data, this allows the development of a comprehensive view reaching from context to life history, providing a thoughtful perspective on the burial process itself.

One of the most prevalent problems with the publication of archaeological material culture is the lack of sufficient published supporting data, or suitably presented data, for future comparison with different assemblages by other scholars. Data sharing and comparability are now considered essential in journal publications as well as in project planning; it is, however, still rare that books/book chapters provide sufficient detail to enable either validity testing or continuing study. Here we can ask: would these volumes, particularly the catalogue in Volume 2, allow another specialist to compare this material with their own? The answer is certainly yes, with the proviso that additional images of both the ornaments and their contexts would have been desirable.

The catalogue provides a descriptive inventory of the individual burials and their accompanying ornaments. Beads and pendants are represented by various forms made of faience, marine gastropod shells, bone, and various stones including chalcedony, calcite, quartz, serpentine, and steatite. The artifacts are illustrated in both drawings and color photographs.



Overall, *Adaima IV* offers detailed insight into the ornamentation practices and expressions of identity within grave contexts during an important period of increasing social and economic complexity in Egypt. The detailed data presentation will undoubtedly prove useful in future comparative studies and the level of detail and generally clear and comparable presentation can be regarded as a model for future studies which aim to be both fresh in perspective and widely useful.

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