

BEADS IN IRON-AGE AND EARLY-MODERN TAIWAN: AN INTRODUCTION

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Archaeological research has revealed a long history of glass bead exchange and use in Taiwan, yet it has seldom been discussed in the literature. This paper provides an introduction to this exchange from the Iron Age (ca. late 1st millennium BC - mid-2nd millennium AD) to the early modern period (ca. AD 1600-1900) by revisiting the archaeological and historical records. It is suggested that changes in bead styles and chemical compositions over time reveal the transition of bead supply in Taiwan, which further reflects two broad phases of bead trade: Phase I) the earlier involvement of Taiwan in the Indo-Pacific bead exchange (1st millennium AD) and Phase II) the later cultural and economic contacts between the indigenous people, Chinese merchants, and Europeans (2nd millennium AD).

THE EMERGENCE OF GLASS BEADS IN PREHISTORIC TAIWAN

Taiwan is a small island located off the southeast coast of continental Asia. The earliest glass beads there can be dated to the late 1st millennium BC on the east coast (Lee 2005a, 2007, 2015). This period witnessed the transition from the Late Neolithic period to the Early Iron Age through the presence of metal objects and glass beads which are regarded as evidence of overseas influence on the local material cultures of prehistoric Taiwan.

The background to the appearance of glass beads in Early Iron-Age Taiwan should begin with the nephrite (green jade) trade in the South China Sea interaction network during the Late Neolithic period (ca. 1500 BC - late 1st millennium BC), which connected mainland Southeast Asia, island Southeast Asia, and Taiwan. Eastern Taiwan is known for exporting nephrite objects and raw materials to Southeast Asia in the Neolithic period (Hung and Bellwood 2010; Hung et al. 2007). Research has shown that, in the late 1st millennium BC, ancient Southeast Asian artisans produced nephrite objects using local iconography (so-called *lingling-o* and double-headed animal ear pendants) in local communities using raw nephrite imported from

Taiwan (Bellwood et al. 2011; Hung and Bellwood 2010). Within Taiwan, nephrite was also an important raw material for producing tools and weapons, as well as decorative objects during the Neolithic (Liu 2003). The exchange and production of nephrite objects therefore demonstrates the active participation of Taiwan in the South China Sea network since the Neolithic period.

The Iron Age arrived earlier in eastern Taiwan than in the western portion. In eastern Taiwan, iron, bronze, and gold objects (with the continued use of lithic tools) appear as early as the 3rd century BC. In southwestern Taiwan, large quantities of iron artifacts appear in the 2nd century AD, when lithic tools become rare in comparison to the eastern region. Archaeologists in Taiwan generally consider that glass beads and possibly metal objects were imported from Southeast Asia in the Early Iron Age, following the nephrite exchange network established during the Neolithic (e.g., Hung and Chao 2016). This is based on the physical similarity of the Taiwanese specimens to the monochrome Indo-Pacific glass beads in the contemporary South China Sea region. It has been suggested that glass beads may have been used as a new type of ornament and iron objects as tools and weapons during the Iron Age, replacing those of nephrite which were common during the Neolithic period (Liu 2005). It is, however, likely that glass beads and iron artifacts signify the introduction of new material cultures during this period, as nephrite and other lithic artifacts are still found at Iron-Age sites in the eastern region.

PREVIOUS RESEARCH ON TAIWANESE GLASS BEADS

Taiwan is regarded as the homeland of Austronesian peoples who migrated across Southeast Asia beginning around 3000 BC (Bellwood 1995) (Table 1). Several Austronesian indigenous groups in Taiwan were consumers of glass beads. Among them, the Paiwan are famous and the most studied for using heirloom polychrome beads.

Table 1. The Cultural History of Taiwan and Related Developments.

Periods	Notes
Paleolithic (25,000 BC - probably 6000 BC)	<ul style="list-style-type: none"> • Earliest human activities date to around 20,000-30,000 BC. • Chipped pebble tools used. • No evidence of agriculture or pottery making.
Early Neolithic (4000-3000 BC)	<ul style="list-style-type: none"> • Small scale of settlements distributed along the coast or rivers. • Hunting, gathering, and fishing are the main subsistence strategies, but there is evidence of agriculture development. • Pottery production performed, primarily cord-marked red wares. • Polished lithic tools used, including nephrite. • The connection to the Paleolithic culture is unclear.
Middle Neolithic (3000 BC-1500 BC)	<ul style="list-style-type: none"> • Localization of Early Neolithic culture in different regions. • Settlements reveal long-term occupation. • The inhabitants practice hunting, fishing, and rice and millet cultivation. • Cord-marked red wares predominate. • Polished stone tools used. • Nephrite used not only for tools but also ornaments. • Nephrite objects exported to Southeast Asia. • The start of Austronesian migration according to the out-of-Taiwan theory (3000 BC).
Late Neolithic (1500 BC-AD 1)	<ul style="list-style-type: none"> • Diversification of regional cultures. • The scale of settlements is larger than during the Middle Neolithic period. • Inhabitants practice hunting, fishing, and rice and millet cultivation. • Plain red wares predominate, except for midwestern and southwestern regions where grayish-black wares prevail. • The use of stone and nephrite tools/ornaments continues. • A greater amount and diversity of nephrite ornaments, particularly in eastern Taiwan. • Nephrite raw materials begin to be traded to Southeast Asia later in the period. • A few bronze artifacts present in northern Taiwan.
Iron Age (Metal Age) (400 BC-AD 1600)	<ul style="list-style-type: none"> • Begins earlier in eastern Taiwan than western Taiwan. • Metal artifacts appear in archaeological sites, including iron (predominates), gold, copper, and bronze. • Iron production probably took place in northern and eastern Taiwan. • Glass beads, bracelets, pendants, and agate beads present; the use of nephrite ornaments declines. • Plain red wares predominate, but decorated wares are present in southeastern and southern Taiwan. • New migrants probably arrive from Southeast Asia. • Archaeological sites of the later period reveal interaction with Chinese Han people.
Early Modern Period (AD 1600-1900)	<ul style="list-style-type: none"> • The Dutch rule the southern part of Taiwan from 1624 to 1662. • The Spanish occupy the northern part of Taiwan from 1626 to 1642. • Qing rule in Taiwan during 1683-1895.

These beads are endowed with social meaning, denoting aristocracy and land ownership, for example (Hsu 2005).

Polychrome beads are also seen in Rukai, Beinan, and Tao, but less is known about their social and cultural significance

there in comparison with Paiwan. Among some groups, specific bead types are used in ritual events. For example, Kavalan shamen use gold-glass beads to communicate with the spirits (Hu 2012). The social and ritual functions of glass beads among the Atayal, Amis, and Siasiat groups are less known. They do, however, use monochrome glass beads combined with those of shell and agate to create necklaces (Hu 1996:51; Ling 1962; Wong 1996:23).

The exchange of glass beads in the prehistoric period and its relationship with the indigenous bead cultures, the Paiwan group in particular, was researched by archaeologists and ethnographers in the mid-20th century. Early discussion often recorded and compared archaeological and ethnographic materials (Kano 1955; Miyoshi 1932). The style of archaeological (surface finds) and ethnographic glass beads related to Paiwan was recorded and chemical analysis was carried out on a few ethnographic specimens (Chen 1966, 1988:361-365; Sato 1988[1942]:190). This was used to discuss the migration of Paiwan ancestors during the prehistoric period. Tadao Kano (1955:66, 78-80) reported some archaeological finds of gold-glass beads in the northern and northeastern regions (confirmed to be the Kavalan group in later research; Chen 2006) and recorded the style and use of several polychrome glass beads among the indigenous groups (likely Paiwan). Some of the archaeological and ethnographic glass beads were further associated with Southeast Asia based on their physical appearance (Kano 1955:66, 78-80; Miyoshi 1932).

Research on glass beads excavated in Taiwan started in the early 2000s and primarily consisted of the chemical analysis of beads from Shisanhang (Tsang and Liu 2001:93-106), Kiwulan (Chen, Chiu, and Li 2008c:188-200; Cheng 2007), Shenei (Cheng 2007), Xiliao (Chen and Cheng 2011), Chongde (Liou, Wang, and Liu 2014), Jiuxianglan (Yang and Lee 2016), and Huagangshan (Hung and Chao 2016:1543-1544). Stylistic analyses, based on the colors and shapes of mostly monochrome beads, were carried out on beads from Shisanhang and Kiwulan (Cheng 2007; Tsang and Liu 2001:93-106). Some of these analyses, however, are preliminary investigations and have been unable to fully address the archaeological meaning of the analytical data. Only recently, with a greater analytical database, has more integrated and interpretive research been carried out by Wang (2016), in which an interdisciplinary approach was used to study glass beads in Iron-Age Taiwan. This research focused on the 1st millennium AD. Studies of beads of the 2nd millennium are limited by a lack of comparative material and most research has concentrated on European influence during the early modern period (late 2nd millennium) rather than the Late Iron Age (early 2nd millennium) (Wang and Liu 2007).

THE FIRST MILLENNIUM AD: TAIWAN IN THE INDO-PACIFIC GLASS BEAD EXCHANGE

Glass beads of the 1st millennium AD have been found at several archaeological sites in different regions of Taiwan with varying temporal placements (Figure 1). Beads appear earlier in the eastern coastal regions than the western. This corresponds to the earlier start of the Iron Age in the east as opposed to the west. In eastern Taiwan, beads appear earlier on the southeastern coast rather than the northeastern one. Generally, from the southeast to northeast, glass beads have been found at Jiuxianglan (ca. 3rd century BC - 8th century AD; Lee 2005a, 2007, 2015), Xiaduoliang (possibly 7th century AD; Lee 2009), Balan (6th-14th centuries AD; Fu and Chen 2004), Huagangshan (the Upper Layer Culture, ca. 100 BC - AD 400; Chao, Liu, and Chung 2013), Chongde (ca. early 1st millennium AD; Liu, Wang, and Chung 2007), Blihun Hanben (ca. late 1st millennium AD; Liu 2014), and Kiwulan (the Lower Cultural Layer, ca. 4th-12th centuries AD; Chen, Chiu, and Li 2008c:17-30).

In northern Taiwan, glass beads have been found at Shisanhang where ¹⁴C dating suggests a very long occupation (2nd-15th centuries AD; Tsang and Liu 2001). Guishan, at the southern end of the Hengchun peninsula, is the only site where glass beads of the 1st millennium AD have been recovered (Li 1993, 1995), and the artifacts show a cultural affinity to southeastern Taiwan during the Iron Age.

In southwestern Taiwan, our current understanding of the types and chronology of glass beads comes primarily from the Tainan region where the majority were reported at archaeological sites dating later than the 2nd century AD, such as Daoye (ca. 2nd-6th centuries AD; Tsang and Li 2010), Litzuwei (ca. 1st-8th centuries AD; Chen and Chen 2017), Wujiancuo (ca. 6th-10th centuries AD; Nanke Archaeological Team 2005), and Xiliao (ca. 6th-14th centuries AD; Liu et al. 2011).

In the 1st millennium AD, bead colors are predominantly monochrome red, orange, yellow, green, and blue (Figure 2, a-e), with occasional black specimens. The majority resemble the well-known Indo-Pacific beads, and are widely distributed in the southeastern, southwestern, and southernmost regions. Most of the beads were grave goods, while some were recovered from contexts where beadmaking may have taken place (e.g., Jiuxianglan). The beads are of drawn manufacture, based on the longitudinal striae on the surface. They are all made of mineral-soda alumina (m-Na-Al) glass and belong to subtype 1, with an elevated level of barium (1040 ppm on average) and low uranium (< 8 ppm) (Wang 2016). The production of m-Na-Al glass originated

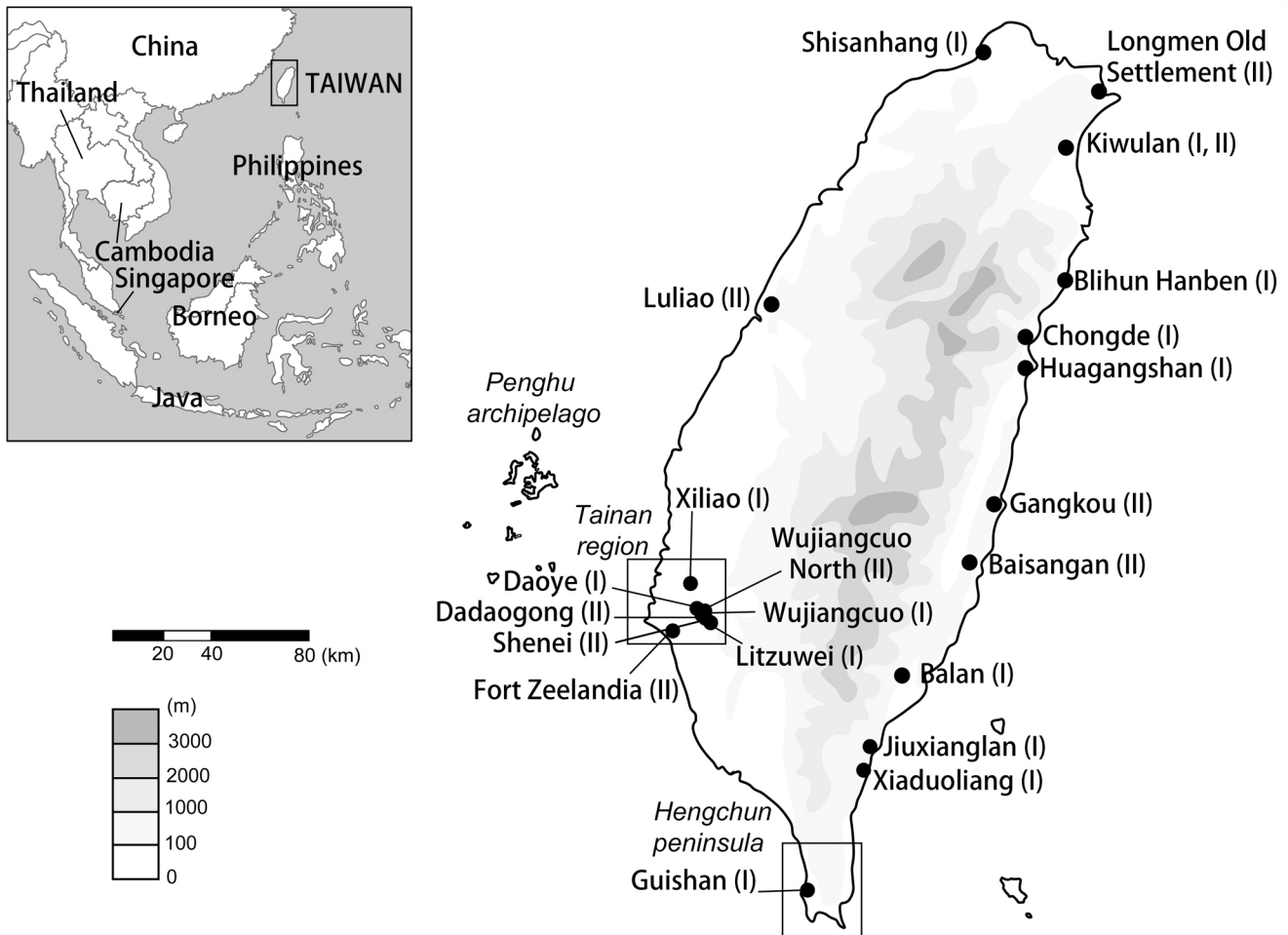


Figure 1. Taiwan showing the location of sites mentioned in text. I: Phase I, the 1st millennium AD; II: Phase II, the 2nd millennium AD (drawing: Kuan-Wen Wang).

in South Asia, where beads of this composition were traded to Southeast Asia between 400 BC and the 1st millennium AD (Dussubieux, Gratuze, and Blet-Lemarquand 2010). The presence of Indo-Pacific beads with this composition matches glass beads from the South China Sea region (Carter 2016; Dussubieux and Gratuze 2010), suggesting that bead exchange during this period in Taiwan was associated with the South China Sea interaction network.

Indo-Pacific beads have also been excavated from burials in the northern and northeastern regions, although they are not as dominant as in the southern areas. Some of the bead styles differ from those of other regions. In particular, the long tubular beads (ca. 6-10 mm in length) covered with orange glass (Figure 2, f) are only found in the northern and northeastern regions (e.g., Shisanhang and Kiwulan). The compositions of the core seem to differ; some are glass while others are of an undetermined earthen

material (pers. obs.). The orange glass is m-Na-Al and the glass core is plant-ash glass (Wang 2016).

Other unique bead types from the northern and northeastern regions include long tubular dark-blue beads (ca. 10 mm in length) (Tsang and Liu 2001:95), shorter tubular light-blue beads (ca. 3-5 mm in length) (Figure 2, g), and small oblate yellow beads (ca. 3 mm in diameter) (Figure 2, h), all with a plant-ash composition (Wang 2016:102-111). These bead types are seldom encountered in other regions of Taiwan, and some are also uncommon in Southeast Asia. Both glass compositions are, however, frequently seen in Southeast Asia (Carter 2016; Dussubieux and Gratuze 2010; Wang and Jackson 2014), suggesting they are related to glass from the South China Sea region. These unique bead types suggest the possibility of glass bead reworking in Taiwan or Southeast Asia.

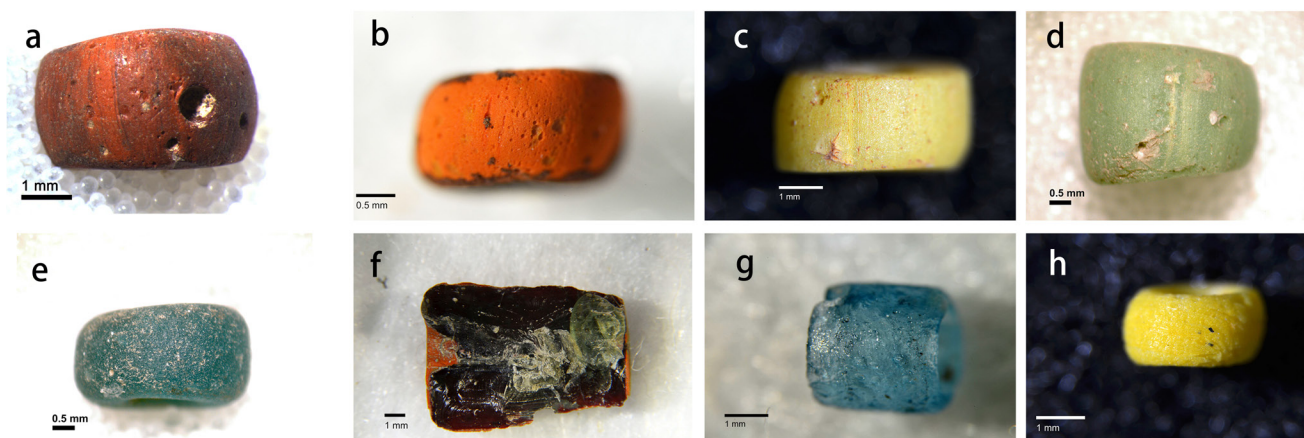


Figure 2. Drawn glass beads of the 1st millennium AD excavated on Taiwan: a) red, Jiuxianglan; b) orange, Kiwulan, Lower Cultural Layer; c) yellow, Guishan; d) green, Daoye; e) blue, Daoye; f) orange outer layer, Kiwulan; g) long, tubular, light blue, Kiwulan; h) yellow, Kiwulan (photo: Kuan-Wen Wang).

The finds of Indo-Pacific beads – with their wide regional distribution and temporal span – indicate the continuous participation of Taiwan in glass bead exchange over at least a millennium in the South China Sea region. The presence of uncommon bead types in northern and northeastern Taiwan also suggests diverse bead exchange during this period. This may be associated with various external exchange networks between these regions and the South China Sea, or may be the result of controlled bead exchange within this particular area.

On the other hand, archaeological evidence of glass bead production has been found in southeastern Taiwan. The presence of a glass bead on a mandrel at Jiuxianglan, together with glass rods, glass wasters, and thousands of glass beads, suggests that this site was a center of wound beadmaking and bead exchange during the Iron Age (Lee 2005b). Recent research, however, has revealed that most of the recovered beads are of drawn manufacture and not wound. The chemical composition and microstructure of the beads and the beadmaking waste also do not match (Wang et al. 2018). It is now suggested that most of the glass beads at Jiuxianglan may be imports from Southeast Asia and, based upon the archaeological find contexts and chronological differences, beadmaking may be a later development at Jiuxianglan. Thus, there is no current evidence for bead production in Taiwan before the mid-1st millennium.

Despite glass beads occurring commonly at Iron Age sites, they are not found until the 10th century in the midwestern region, where the first known occurrence is at Luliao. Their appearance and chemical composition, however, are not similar to the Indo-Pacific beads found at other Iron Age sites during the 1st millennium.

THE SECOND MILLENNIUM: A TRANSITION IN GLASS BEAD SOURCES?

At the turn of the 2nd millennium, different styles and chemical compositions of glass beads occur. Most are wound or folded, as indicated by wind marks that encircle the bead in many cases (Ho and Liu 2005). A greater variety of bead shapes are present, compared to the 1st millennium. In addition to oblate and tubular forms, there are long bicones, long ovals, and faceted forms (Figure 3). Although the majority are still monochrome, the hue of most beads differs from those of the 1st millennium. The colors include opaque white, milky blue, translucent pale blue, and ruby red (Chen, Chiu, and Li 2008c:18-26; Ho and Liu 2005). There are also a few polychrome specimens, mostly with a combed design. The lead-silicate glass (high-lead glass) composition with or without potash predominates during this period, while soda-lime-silicate glass and potash-lime-silicate glass are encountered occasionally (Cheng 2007; Cui et al. 2008). The varied bead styles and chemical compositions may indicate a change in bead origin(s) in Taiwan, which matches what was happening in Southeast Asia as well.

The Late Iron Age: Glass Beads of Chinese Origin?

At present, Luliao (ca. 10th-16th centuries) in midwestern Taiwan is the earliest site where wound beads with a high-lead composition have been excavated, and both lead-silicate glass and potash-lead-silicate glass have been reported (Cui et al. 2008; Ho and Liu 2005). Glass beads have also been recovered from sites such as Dadaogong, Wujiancuo North, Shenei (all ca. 15th-17th centuries) (Cheng 2007; Nanke Archaeological Team 2005), and Fort

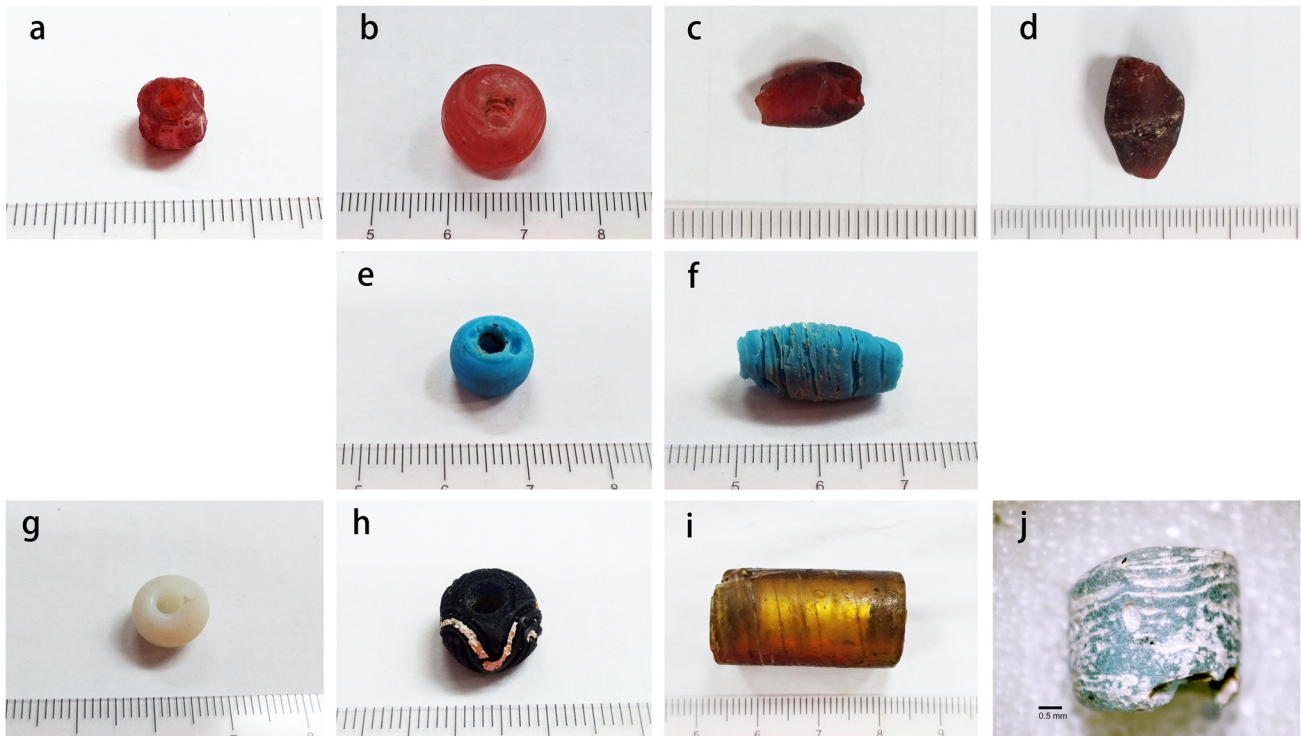


Figure 3. Taiwan glass beads of the 2nd millennium AD: a-d) ruby red; e-f) milky blue; g) white coil; h) dark blue with wavy decoration; i) gold-foil; j) tubular with unaltered ends (a-i, from the Upper Cultural Layer at Kiwulan; j from Wujiancuo North) (photo: Kuan-Wen Wang).

Zeelandia (17th century; Lee, Liu, and Fu 2006:2/117-2/121) in southwestern Taiwan, from Kiwulan (the Upper Cultural Layer, 15th-19th centuries; Chen, Chiu, and Li 2008c:17-30) in northeastern Taiwan, and from Baisangan (ca. 10th-15th centuries; Yeh 1993) and Gangkou (ca. 13th-19th centuries; Yeh 2005) in eastern Taiwan. Chemical analyses carried out on glass beads from Kiwulan (Cheng 2007) and Dadaogong and Shenei (Kuang-Ti Li 2015: pers. comm.) reveal they are composed of potash-lead-silicate glass. The presence of lead-silicate and potash-lead-silicate glass in this period clearly suggests a different tradition of glassmaking, possibly Chinese, in comparison to the m-Na-Al glass and plant-ash glass of the 1st millennium AD. Lead-silicate glass and potash-lead-silicate glass were also found in contemporary Singapore (Dussubieux 2010) and Cambodia (Carter, Dussubieux, and Beaven 2016), suggesting that the transition of glass composition was a regional phenomenon around the South China Sea.

A preliminary investigation of the glass beads reveals the presence of different styles and beadmaking methods. For example, at Luliao and Kiwulan, styles include ruby-red beads with biconical, long tubular, long oval, and round forms (Figure 3, a-d), opaque white coil beads (Figure 3, g), and dark-blue oblate beads with white wavy lines around

the middle (Figure 3, h) (*see also* Chen, Chiu, and Li 2008c; Ho and Liu 2005). These styles are rare in the earlier period. Swirls that encircle the coil beads indicate they were wound, while seams on the long tubular ruby-red specimens suggest the use of the folding method. Considering the dates of Luliao and Kiwulan, the similarity of their beads does not necessarily imply direct exchange between the two but rather may indicate the sharing or participation in similar exchange networks over hundreds of years.

It should also be noted that white/black biconical beads seem to be present only at Luliao (Ho and Liu 2005), while large quantities of “golden beads” (long tubular beads with gold foil sandwiched between two glass layers; hereafter gold-foil beads) were excavated at Kiwulan (Figure 3, i) and other sites in northeastern Taiwan, such as Longmen Old Settlement (Pan 2005), but not in other regions. In addition, the light-blue beads with a tubular shape and unaltered ends (Figure 3, j) predominate at Dadaogong in southwestern Taiwan. Similar styles have also been found at Wujiancuo North and Shenei in the same region.

There are obvious differences between the beads of the 1st and 2nd millennia in terms of their chemical composition (soda-fluxed-silicate glass to high-lead glass), beadmaking technology (drawn to wound/folded), and

styles (typical Indo-Pacific beads to varied styles including coil beads, long ovals, etc.). Taken together, this suggests a possible change in where the raw glasses were made and the beads produced. Here, the presence of high-lead glass suggests a Chinese tradition of glassmaking, as lead-silicate glass and potash-lead-silicate glass were produced in China no later than the Tang dynasty (618-907) (Brill, Tong, and Dohrenwend 1991; Gan 2007). The winding technique (coil beads) and ruby-red beads are also thought to be associated with China (Francis 2002:75-78). A Chinese-related origin thus is possible for glass beads in the early 2nd millennium, which suggests an extension of the trading partners in the South China Sea network.

For Chinese contact in Taiwan, the archaeological record reveals the temporary settlement of Chinese Han people on the Penghu archipelago, off midwestern Taiwan, since the late Tang dynasty (ca. 8th century), but not the main island of Taiwan (Tsang 1995:66-68). From the 8th century onwards, trade/exchange activities, direct or indirect, between the Han people and the inhabitants of Taiwan are exhibited by other artifacts such as Chinese coins, ceramic wares, and porcelains (Hung and Chao 2016; Liu 2011:262-264). During the Song (960-1279) and Yuan (1271-1368) dynasties, the Han people from southeastern China fished off the coast of southwestern Taiwan, which may have facilitated economic interaction between the Han people and the local population (Tsao 1979:119-120, 154).

The likely change in the source(s) of glass beads during the 2nd millennium does not, however, mean that Taiwan ceased to engage in the South China Sea interaction network. The archaeological record reveals that the ceramic wares and porcelain probably imported from China became common in Taiwan in the early 2nd millennium (Liu 2002:70). Chinese ceramics are also present in Southeast Asia during this period; e.g., the Philippines (Junker 1999:189-194) and Borneo (Harrison 1970), as well as countries on mainland Southeast Asia, including Thailand and Cambodia (Miksic 2006). The trade/exchange of objects (including glass beads) with communities in Southeast Asia is recorded in a few Chinese archives. In *Zhu Fan Zhi* ("Description of Barbarians"), written by Rugua Zhao in the early 13th century, it is mentioned that glass beads and other objects (such as metal, ceramics, and silk) were traded to the Philippines and Borneo. In the 1330s, the trade in glass beads, ceramics, porcelain, metal, and silk in Southeast Asia was more widely noted in *Dao Yi Zhi Lue* ("A Brief Account of Island Barbarians"), written by Dayuan Wang. Neither document mentions the inter-island exchange of glass beads to Taiwan. It is only in *Dao Yi Zhi Lue* where "soil beads [possibly glass or clay beads], agate, gold beads, coarse [ceramic] bowls and Chuzhou wares" are noted as trade items.

An expansion of maritime trade with the participation of Chinese merchants in the broader South China Sea region is supported by the archaeological finds of new Chinese-type glass beads in Taiwan and the historical literature documenting glass bead exchange in Southeast Asia during the 2nd millennium. The presence of Chinese-type beads at Luliao during the early 2nd millennium may represent the early reach of Chinese mercantile activities. The beads found at other sites later than Luliao suggest Taiwan's continuous acquisition of these items with the supply changing to Chinese-related sources in the broader South China Sea exchange network during the Late Iron Age.

The Early Modern Period: Complex Exchange Activities Between Peoples

The early modern period in Taiwan was initiated by the arrival of Europeans in the 1620s. The Dutch settled in southwestern Taiwan in 1624 and the Spanish occupied northern Taiwan in 1626. During this period, Taiwan was a hub of the Dutch East India Company (VOC) and the Spanish Empire for the trade between Southeast Asia, China, and Japan. A discussion of glass bead exchange during this period is rather difficult and challenging. This is partly due to the lack of research and partly because of the complex economic interaction between the Europeans, their exchange partners in Southeast Asia, and the local people of Taiwan. Within Taiwan, the Europeans might have brought "new" glass beads to establish relationships with local communities, but currently there is no strong evidence to support a European origin of raw glass. Wang and Liu (2007) tried to explore potential European sources based on the stylistic similarities and relevant artifactual evidence of a blue glass bead found at Fort Zeelandia (a fortress built by the Dutch at Tainan between 1624 and 1634) and the gold-foil beads recovered from Kiwulan, but were unable to reach solid conclusions due to the lack of compositional data and other comparative information.

Some glass beads which are still used by current indigenous groups in Taiwan may also have been acquired during this period. This may be inferred from archaeological excavations and the ethnographic and anthropological studies conducted during the second half of the 20th century, during which similar glass beads were recovered and recorded. Current debates regarding indigenous glass beads have focused on their origin. Both European and Southeast Asian origins have been considered, as well as the Chinese contribution of glass beadmaking around the South China Sea (de Beauclair 1970; Chen 1966; Chen et al. 1994:79; Chiu 2001:96; Miyoshi 1932). The regional variation in glass bead styles used by the indigenous groups suggests

that bead exchange during the early modern period cannot be attributed to a single model of exchange activity but should take into consideration the multi-scalar interaction between peoples. Several examples are provided below.

Glass Bead Exchange in Northern and Northeastern Taiwan

During the Spanish stay in Taiwan (1626-1642), a few written records were left in the Spanish archives concerning the local bead trade. In northern and northeastern Taiwan, the acquisition of beads from *sangleys* (traveling Chinese merchants or middlemen) is noted in the archives on Isla Hermosa (the Spanish name for Formosa Taiwan). In reports written in 1632, Jacinto Esquivel, a Spanish missionary (Borao Mateo 2001:162-189), recorded the villages in northeastern Taiwan, including:

Turoban: one village. It has many rich gold mines. The taparris [local population from northern coastal Taiwan] collect gold in huge quantities and sell them to the *sangleys* [Chinese traveling merchants] who pay in stone money and *cuentas* [small colored stones] (Borao Mateo 2001:163).

The *cuentas* may be “small colored stones strung together in the manner of a necklace or a rosary” (Borao Mateo 2001:163) and it is likely that the term refers to glass beads. Based on his observations, Esquivel suggested that the Spanish could also purchase *cuentas*, brass bracelets, and small stones (likely carnelian beads), possibly from the *sangleys*, to exchange for sulphur with the local population. The (re-)exchange of *cuentas* by local people in northern coastal Taiwan was also noted by Esquivel who mentioned that the Qimaurri people traveled among villages in the northern and northeastern regions, exchanging their physical labors, as well as *cuentas* and stones.

It therefore seems that Chinese merchants were the dominant suppliers of glass beads to the local people in the northern and northeastern regions during the early modern period. The inhabitants, such as the Qimaurri, may have acted as middlemen to trade beads to other communities. The Spanish may also have used glass beads, purchased from the Chinese merchants, to exchange for local resources.

The possibility of a non-European origin for the beads, in terms of raw materials, should be considered, and can probably be deduced from the chemical analysis of a few samples. For example, the polychrome and gold-foil beads from the Upper Cultural Layer at Kiwulan are potash-lead-silicate glass (Cheng 2007; Cheng, Iizuka, and Chen 2008). This composition differs from that of European glass beads

which are mostly soda-lime-silica or potash-lime-silica glass (Burgess and Dussubieux 2007; Dussubieux and Karklins 2016; Walder 2013), suggesting a Chinese origin for the Kiwulan specimens (Brill, Tong, and Dohrenwend 1991; Gan 2007). Where the workshop(s) were located remains undetermined.

Gold-Foil Beads in Northeastern Taiwan

Gold-foil beads have been excavated from the Upper Cultural Layer (15th-19th centuries) at Kiwulan in northeastern Taiwan. Wang and Liu (2007) suggest that, based on the stylistic forms of other overseas goods in the same burials, the import of gold-foil beads may have begun during the late 16th or early 17th century. The archaeological evidence suggests that this site may be an old settlement of the indigenous Kavalan people during the early modern period (Chen 2006). Tadao Kano's (1955:79) ethnographic research in the 1920s and 1930s noted that gold-foil beads (*pagao*) were still common in Kavalan societies then. Hu (2012:112) adds that, according to a Kavalan female shaman, this bead type was used to practice shamanic divination, although other interviews suggest that agate beads were also used. Thus the evidence suggests that gold-foil beads were present in northeastern Taiwan as early as the 17th century and remained in continuous use among the indigenous Kavalan group.

Based on the archaeological finds at Kiwulan and the exchange activities noted in Esquivel's report, the Kavalan people may have participated in the exchange network operated by the Taparris, the Qimaurris, the *sangleys*, and the Spanish during the 17th century. It has been suggested that the Kavalan people, who practiced rice cultivation, may have bartered rice and other resources to obtain craft items from the Basay people (i.e., the Taparris and the Qimaurris), the *sangleys*, or the Europeans (Chen 2012). On the other hand, the recovered artifacts suggest direct or indirect exchange with the Chinese (based on the ceramic wares) and Europeans (based on the tobacco pipes) (Chen, Chiu, and Li 2008a:64-125, 2008b:92-109, 2008c:108-109; Wang and Liu 2007). Thus the acquisition of gold-foil beads may be associated with this exchange network, although it is not clear whether the Kavalan people obtained their beads from the Basay people, the Chinese *sangleys*, or the Spanish.

Gold-foil beads have not only been found in northeastern Taiwan, but also in Southeast Asia. It is noteworthy that ethnographic research by Tadao Kano (1955:79) in the Philippines noted gold-foil beads at Ifugao. Based on the presence of similar styles of Chinese and Southeast Asian ceramic wares at Kiwulan and on a Spanish shipwreck off

the Philippines, a possible exchange route for gold-foil beads via the Philippines during the 17th century has been hypothesized (Wang and Liu 2007). The presence of gold-foil beads therefore may not only reflect the interaction between peoples in northeastern Taiwan, but may also be associated with the economic activities of the Spanish in the South China Sea region.

Polychrome Glass Beads in Southeastern Taiwan

The Paiwan people of southeastern Taiwan are another example. They are famous for using heirloom polychrome glass beads as ornaments, although monochrome glass beads are also used for decoration (Figure 4). The heirloom beads are linked to the social status and kinship of Paiwan societies (Hsu 2005) and are called *ata* or *qkata* (Lin 2018; Umass 2005). The excavation of Iron-Age sites of the 1st millennium AD in southeastern and southern Taiwan (e.g., Jiuxianglan, Xiaduoliang, and Guishan) has unearthed Indo-Pacific beads and pottery with anthropomorphic and hundred-pace snake designs (Lee 2005b, 2007, 2009; Li 1993, 1995). The designs are similar to the decorative elements used by current Paiwan groups, although the physical appearance and chemical composition of Iron-Age beads differs from that of the heirloom glass beads. Excavations at Jiuxianglan (3rd century BC - 8th century AD) in southeastern Taiwan have led to the supposition among Taiwan archaeologists that there may have been local glass beadmaking in Paiwan since the prehistoric period (Lee 2005b, 2007), although recent research does not fully support this assumption. Wang et al. (2018) suggest that the beads recovered from Jiuxianglan may be imports rather than local products. While wound beadmaking technology was used at the site, the recovered beads are drawn. Furthermore, the chemical compositions of the glass debris and the beads do not match. The beadmaking waste also does not indicate the production of polychrome beads, only monochrome specimens. Questions still remain regarding the origin of the Paiwan polychrome heirloom beads and the possible connection of this bead culture to beads dating to the Iron Age. At present, in terms of style and chemical composition, there is little evidence that suggests a direct relationship of the heirloom beads to prehistoric Indo-Pacific beads. The acquisition of polychrome beads may, however, be linked to bead exchange during the early modern period, while their use during this period is obscure.

Previous research has proposed that the Paiwan polychrome beads originated in Southeast Asia (Borneo in particular) or Europe. Regarding a Southeast Asian origin, Tomokazu Miyoshi (1932) noted similar polychrome bead styles among the Kayan and Kelabit tribes in Borneo and

suggested that this might be the homeland of the Paiwan. Chen (1966) and Chen et al. (1994:79) have made a similar argument for a Southeast Asian origin, but with a different chronology. Chen (1966) suggests an “upper time limit” of the early 1st millennium (Iron Age) in terms of the import of Paiwan polychrome beads and the migration of the Paiwan from Southeast Asia to Taiwan. Considering that few polychrome glass beads have been excavated at Iron-Age sites, the “upper time limit” proposed by Chen (1966) requires reconsideration. Chen et al. (1994) associate the polychrome beads with Borneo but with a later date, around the 17th century. It is further indicated by Chen et al. (1994) that a Chinese workshop in Java may be the place where the polychrome beads were made, and they were probably exchanged and circulated in island Southeast Asia and Taiwan.

Despite the hypothesis of a Southeast Asia origin, previous chemical analyses of polychrome glass beads among the indigenous Paiwan groups suggest a Chinese source. This was first reported by Sato (1988[1942]:190) and later by Chen (1988:364). These analyses revealed a high-lead content in the glass and the beads were initially misinterpreted as a Southeast Asian import based on the absence of barium oxide which is indicative of local Chinese glass of the pre-Han and Han periods (Chen 1966, 1988:361-365). This chemical composition was regarded as evidence by Chen (1988:366) that the polychrome beads were precious items brought into Taiwan from Southeast Asia during the early 1st millennium AD (Iron Age) by the ancestors of the Paiwan group. This argument was, however, based on an insufficient understanding of glass bead exchange in Taiwan and beyond during the mid-20th century. Subsequent archaeometric analysis of Chinese and Southeast Asian glass has revealed that the high-lead glass beads used by the Paiwan group may be associated with a Chinese origin during a period later than the early 1st millennium AD (Wang and Jackson 2014). The results of the analysis of Chinese glass have therefore cast doubt on a Southeast Asian “origin” – in terms of glass production – of the polychrome beads. In fact, there is no solid evidence for local production of this type of polychrome bead in China. Similar styles of beads were reported principally in Southeast Asia (e.g., Borneo), but with unknown chemical compositions. This raises questions regarding the circulation of Chinese glass materials, production knowledge, or glassworkers around the South China Sea, questions which unfortunately cannot be fully answered based on current research. It is therefore important that future research consider the possibility of knowledge transmission regarding Chinese glass production or the migration of Chinese craftspeople, as well as the likely reworking of Chinese glass into beads, in the South China Sea region.



Figure 4. Paiwan heirloom glass beads (photo: courtesy of Department of Anthropology, National Taiwan University; cat. no. 1181).

As for a possible European origin, de Beauclair (1970) suggested a Dutch origin for the Paiwan heirloom beads based on archival records regarding Dutch activities in the early modern period, as well as her field observations in eastern Taiwan. Similarly, during fieldwork on a Paiwan tribe, Chiu (2001:96) noted that the glass beads were said to have been acquired from the Dutch. A few 17th-century Dutch archives also record that (glass) beads were given as gifts, rather than exchange objects, to local communities in Taiwan. Written in the 1640s, *De Dagregisters van het Kastell Zeelandia, Taiwan* (“Diary of Fort Zeelandia”) mentions that the gold expeditions of the Dutch VOC gave *corales* (beads which could be made of glass or other materials) to villages in eastern Taiwan, including the southeastern region, to

establish friendly relations, and these *corales* were regarded as luxury goods by the local societies (Kang 1999:116-127). The Dutch may therefore be one of the sources from whom the indigenous people of southeastern Taiwan acquired glass beads as symbols of social status. It is unclear whether the beads the Dutch brought were produced in Southeast Asia or Europe.

The hypothesis of a Southeast Asian origin concentrates on the overseas exchange and circulation of glass beads, and the inter-island re-exchange or redistribution of glass beads by middlemen or Europeans has not been investigated. This reveals the complexity of glass bead exchange on Taiwan. A comprehensive understanding should take into consideration

the long-distance exchange and movement of objects, ideas, and peoples in the broader South China Sea region during the early modern period. Unfortunately certain research is limited in terms of glass beadmaking during this period and bead exchange between the Europeans, the beadmaking workshops, and the bead traders in Southeast Asia. Similar to the case in northeastern Taiwan, it is apparent that the acquisition of glass beads in southeastern Taiwan comprises different scales and contexts of people interaction and the movement of materials within Taiwan and between it and Southeast Asia. Therefore, future research should not simply focus on the origin of glass beads in indigenous societies but explore multi-scalar interaction during the early modern period.

CONCLUDING REMARKS: CHANGES AND CONTINUITIES

Clearly, there is a long tradition of glass bead exchange and use in Taiwan since the 1st millennium AD. These small glass objects reflect the changing interaction between peoples during different periods. The Early Iron Age witnesses the presence of Indo-Pacific glass beads during the 1st millennium AD, demonstrating the continuous participation of Taiwan in the South China Sea network since the Neolithic period. During the Late Iron Age, the dominance of Chinese-type glass beads suggests the growing involvement of Chinese merchants. The transition from the Early to Late Iron Age is revealed in the various styles and chemical compositions of the beads. For the early modern period, an integration of archaeological finds and historical literature reveals complex economic interaction between Europeans, Chinese merchants, and local communities. Indigenous glass beads connect the bead culture of the indigenous peoples to the early modern period, although less is known about the consumption of glass beads in local societies during this period.

While research in recent decades has increased our knowledge of glass bead exchange and consumption on Taiwan from the prehistoric to the historic era, it is hoped that future research will uncover more information about bead exchange on Taiwan and beyond from multi-scalar perspectives.

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