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Silla's Face-Inlaid Glass Bead and Ancient Networks of “Hallyu”

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Abstract

This study investigates the symbolism and production of Silla face-inlaid glass bead to reassess their origin and significance within the context of ancient Korean craftsmanship and cultural exchange. Through design analysis, archaeological data, textual sources, and comparative cultural study, the paper argues for the likelihood of local production in Silla, supported by advanced metalworking and inlay technologies. The analysis also explores how these beads reflect a unique shamanistic worldview, and how their distribution pattern provides insight into Silla's participate on in steppe and maritime Silk Road trade networks. The findings contribute to a reevaluation of Silla's technological and symbolic sophistication and suggest a broader role for ancient Korea in early trans-regional cultural interaction.

Keywords: Silla, face-inlaid glass bead, metal inlay, bead symbolism, Silk Road, ancient exchange, shamanism.

Introduction

Among the most artistically intricate artifacts from ancient Korea, face-inlaid glass bead from Silla (4th ~6th century) represent a unique masterpiece of artistic symbolism and technological complexity. While often attributed to foreign origins [1, 2], this study reexamines their local production and broader cultural context by focusing on technical characteristics, symbolic motifs, and trade history. Recently, the theory of ancient Korean production has emerged, focusing on its design elements of Korean tradition, such as the topknot and crown decorations [3]. Ancient Korea, which possessed precise engraving and metal inlay techniques and had a tradition of extravagant funeral customs, produced on its own. Gold ornaments, necklaces, bracelets, rings, earrings and glass are always excavated from high-level Tombs [4], and this stone mound Tombs connected with the North are a unique Korean culture that does not exist in the center China [5]. The goal is to contribute to the growing body of scholarship that challenges Sinocentric narratives and recognizes the technological and cultural agency of ancient Korea.

Distinctions between the North and the Center China

A large quantity of multicolored glass beads and metal-glass composite ornamental earrings were excavated from Noin Ula Tombs in Mongolia [6] and ancient Korea. Beads were found in large quantities in Noin Ula, Mongolia [7] and Bactria [8], which shared the afterlife belief, and in nearby Japan, similar shape of inlaid glass bead was found. This glass-metal composite manufacturing technology proves that the Huns had close exchanges with ancient Korea and Central Asia. There are many cultural similarities between the Xiongnu and Mongols such as yurt on cart, composite bow, board game, horn bow and long song [9].

The Huns, Yuezhi, and ancient Koreans called themselves the descendants of heaven and had a belief that identified the sun and the bird. Accordingly, they revered the beads as the eggs of the sun bird in the sky [10]. Accordingly, not only the outer appearance but also the patterns inside the glass beads were arranged 360° to create a true 'sphere'. The Silla face-inlaid glass bead is 1.8 cm in diameter and have four human faces, six white birds, and four trees inlaid on blue background, and their artistry and technical excellence are world-class (Fig. 1a-c). It includes topknot and crown decoration, neck and chest, beautiful white birds with spread wings, and flower trees. In particular, the topknot and crown decoration of the faces are Korean elements [3].

There are no artifacts identical to the face-inlaid glass bead in Java, Indonesia, but the production method of the Jatim beads is similar and the technology is still preserved, so it has been suggested that they may have been produced in Java [11]. However, since Southeast Asia does not have a historical tradition of wearing beads, it is understood that it is not the consumer or origin of the beads. Glass beads were a trade item on the Silk Road. Since gilt glass beads are widely distributed not only in Korea (Fig.1d) but also around the world, they can be used to understand ancient exchanges. In addition, spherical gold polyhedral decorations (Fig.1e), which are collections of gold grains, are widely distributed in Korea, Vietnam, the Philippines, Indonesia, and other countries [12].

Korean inventions such as the compass and ships have been mistakenly attributed to China or Japan. In addition, although the Xiongnu and Tibet have been historically described as “barbaric,” archaeological and historical evidence suggests otherwise. The Xiongnu had a military advantage over the Han Chinese, and Tibetan culture was much more sophisticated than the Chinese [13].



Figure 1. Bead treasures of Korea Silla
a-c) Multi-angle photographs of Silla face-inlaid glass bead (*Gyeong-ju*, Treasure #634, diameter 1.8cm)
d) Gold-leafed glass beads (*Cheong-ju*)
e) Gold polyhedral decoration bead (*Wangheung-sa* pagoda)

Dong-Yi (東夷) peoples possessed superior metalworking skills than the center China, and were superior in shipbuilding and marine engineering. Thus, it is essential to reevaluate and correct the historical bias that resulted in the appropriation of the cultural heritage of neighboring countries. A more balanced and comprehensive perspective is needed to understand the true nature of cultural development and exchange between ancient East Asia and Central Asia. Therefore, this study examines the symbolism of Silla inlaid glass beads and the cultural significance of beads in ancient Korean tradition, while also exploring the broader aspects of exchange along the ancient Silk Road.

Korean Makhan's bead tradition

Around the beginning of the Common Era, Koreans placed high cultural and symbolic value on beads, decorating their bodies and garments extensively with them. Chinese records such as the *Hou Hanshu* and *Sanguozhi Dong-Yi-Jeon* noted this practice as unusual, repeatedly emphasizing it [10]. Among the *Makhan* (馬韓) *GoJosun* (古朝鮮) people, beads were more highly prized than gold, silver, or silk, and were worn on clothing, around the neck, and on the ears. Red beads were notably produced in *Buyeo* (*Puyo* 夫餘, 扶餘), and Silla women braid their hair and adorn it with colorful beads and silk fabrics. This preference reflects the beads' spiritual, magical, and religious significance.

Jade beads excavated from the *Hongshan culture* (紅山) suggest that sun worship played a role in the cultural significance of beads [3]. The round shape of beads also connects with myths of egg birth and sun worship [14], and various Korean folktales portray beads as symbols of the soul, divine power, royal authority, or supernatural beings [15]. In early Korea, personal adornment was closely linked to identity and social status. During the *Mumun* period (1,500–300 BCE), greenstone

bead necklaces featuring *gogok* magatama (comma-shaped beads) were found in dolmen burials, often associated with elite or shamanic roles [16]. The *Makhan* people's reverence for beads appears to stem from cosmological beliefs centered on the sun, moon, and stars—motifs deeply rooted in Dong-Yi and northern traditions. For instance, the three-legged crow (*Samjok-o*) represented the sun, and its egg symbolized divine birth [10]. Their sky-worship beliefs are reflected in the use of titles such as *Cheon-Ja* (天子 Son of Heaven) [17], *Gan* (干), and *Khan* (汗, 韓) for leaders, terms initially used by the *Yi-Di* (夷狄) people [18].

Beads were made from readily available materials such as stone, clay, wood, metal, and slag, indicating their accessibility and widespread use across classes in ancient Korea [19]. Early records associate bead use with Buyeo and Makhan, but later examples are abundant in Silla, reflecting the moving population. Buyeo, situated in East Tartary [20], and Makhan, in the westernmost part of the Korea, were both closely connected to Silla and Yuezhi [21].

The Yuezhi (月氏 月支), known for their expertise in colored glassmaking, were recorded as artisans who could melt stone and produce brilliant, luminous glass that surpassed Chinese craftsmanship [22]. As a powerful trade center for jade and silk, the Yuezhi or Muzhi (目支) was related with the 54 states of Makhan and possibly migrated from the *Qilian* (祁連) Mnt. in Gansu to the Dong-Yi residence. Notably, *Maodun*, son of Xiongnu chieftain *Touman Chanyu*, was once sent as a hostage to Yuezhi [17], highlighting geopolitical links between the Xiongnu, Yuezhi, and ancient Dong-Yi / Dong-Ho (東胡) [23].

Origin of beads: Hongshan culture

Ancient Koreans held stones in high regard, considering them sacred and culturally significant [20]. Fine stone tools and sharp obsidian reflect the technological sophistication of early Korean societies. Jade, in particular, was prized by the elite for ornamental use. Mythological texts describe the transformation of *Hwanggung*, *Mago*'s son, into a stone after ascetic practice, and the Dong-Yi people performed rituals before extracting stones [24]. *Dangun* is also said to have taught people essential skills such as grinding (stone), farming, sericulture, and pottery, and praised the land for its colorful stones when founding GoJosun. The beautiful stones, jade beads and earrings, dating to ca. 4,000 BCE, have characterized both Hongshan culture sites and Neolithic locations of Korea [3]. The Dong-Yi, inhabiting both the eastern coast of the continental and Korea's western shore, were part of an interconnected jade culture tradition that included the *Hongshan*, *Liangzhu* (良渚), and *Longshan* (龍山) cultures [25]. These cultures used nephrite jade for elite adornment—headgear, clothing, weapons—symbolizing spiritual and political power [26].

Korea's early material culture also emphasized human and animal faces more than full human figures. Facial representations appear as early as the Paleolithic era, with the world's oldest carved smiling face found on a deer shin bone from *Durobong*, Korea [3]. Similarly, shell pendant with carved human face was worn as necklaces at Hongshan culture [27].

The origins of glass remain unclear, but by the Early GoJosun period,

evidence suggests bead-making technology was already in use. A bead mold excavated from the *Xiajiadian Lower Culture* (夏家店下層文化) alongside bronze knives indicates that molten glass, copper, or gold was poured into molds [28, 29]. Slag, a byproduct of smelting, is also used for bead production [30]. Glass thus appear throughout the Metal Ages [31, 32], including bead-shape bronze ornaments linked to Eurasian steppe cultures such as the Altai and Karasuk [33].

Blue glass beads from *Pyeongra-ri* and *Songguk-ri* date to the 5th century BCE [34], showing GoJosun's high skill with stone-glass processing and inlay. A wide variety of spherical beads—made from minerals like steatite, agate, amber, and eventually glass and gold—were crafted. Clay molds for small glass beads have been excavated at sites including *Misa-ri* relic, *Pungnap* mud castle, *Hwangnam* great Tomb, and others, demonstrating nationwide production during the Iron Age. Some molds feature holes as small as 1.0 mm, and iron cores used in bead casting have been recovered from *Nakrang* Tombs in *Pyongyang* [35, 3]. North Korean scholars suggest that glassmaking began as early as the 7th century BCE—during the *Slender Bronze Dagger culture* [36]. Small monochrome beads appeared in the 3rd century BCE, while larger beads and more complex ornaments using granulation and gold thread emerged by the 3rd century CE [16].

Korean inlay and metalworking tradition

Korea developed a refined inlay technique, in which carved surfaces were embedded with shells, metal, jade, or even insect wings. This method was widely used in Korean metalwork and mother-of-pearl lacquerware, both noted for their high artistic and technical value. Early examples include jade beads in the eyes of goddess statues of Hongshan culture, as well as inlaid earthenware and jade pieces using green pine jade excavated from the *Dawenkou Culture* (大汶口文化) relics on the *Gyodong Peninsula* (current Shandong) [28].

During the Three Kingdoms period, inlay—particularly metal inlay on iron objects—was widely employed [37]. Despite its difficulty, metal inlay accounts for the majority of excavated artifacts, requiring precise grooves and strong bonding techniques. The blue glass beads inlaid into golden earrings from *Gyeseong*, *Changnyeong*, demonstrate this technical mastery [10]. Lacquer *Chil* (漆) and silk threads were the specialty of Dong-Yi (厥貢漆絲). At the time, Central Asian ammonium chloride and Tibetan borax were key traded substances used as metal processing agents [21].

East Asia's earliest metal artifacts include a bronze earring from the *Niuheiliang Site* (牛河梁 ca. 3,500 BCE) and bronze chimes and double-figure ornaments from *Jangri Tomb No. 1* in *Pyongyang* (ca. 3,000 BCE) [21]. Bronze culture in the *Zhukaigou* (朱開溝文化) region of Inner Mongolia and Manchuria predates that of the center China and dates to around the 20th century BCE [38]. The precision of GoJosun metallurgy is seen in the *DaNuSeMun-Gyeong* (多鈕細紋鏡) mirror from the 4th century BCE, a level of craftsmanship difficult to replicate even today [39, 29]. GoJosun bronze included zinc, which improves castability—unlike Chinese bronze, which only incorporated zinc after the Han dynasty [21]. Other representative artifacts include lute-shaped bronze swords, ring-pommeled swords,

and iron horse bridles, with the latter made of durable materials suitable for riding equipment [40].

Legends such as Chiyu (蚩尤)'s "bronze head and iron forehead" (*Dong Du Cheol Ak*, 銅頭鐵額), and the character for iron (鐵)—originally written as '鉄', *metal* '金' of *Dong-Yi* '夷'—suggest that Dong-Yi peoples pioneered steelmaking. The *Records of the Three Kingdoms Dong-Yi* notes that iron was produced in *Byeon-jin* and traded to *Makhan*, *Ye*, *Wae*, *Nakrang*, and *Daebang*, confirming GoJosun's mastery of iron processing. North Korean scholars date Korea's Iron Age to the 8th–7th centuries BCE, while South Korean estimates range from the 7th–1st century BCE—a delay attributed to Japanese colonial scholarship. GoJosun produced various types of iron, including wrought iron, pig iron, and steel, and employed heat treatment technologies well in advance of European use of pig iron in the 14th century [41].

Silla later continued and refined these traditions. Its high-performance ironware was exported along with silk and furs and maintained strong ties with the Yuezhi, who were silk people Seres, renowned for glass and golden crafts [42]. Silla's construction of the world's first large-scale iron Buddha (*Jang Yuk Jon Sang*, 丈六尊像 approx. 5 m height) marks a pinnacle of its metal culture (*Samguk Yusa*, 574 AD) [21]. Silla also exported iron-based magnets to the Tang dynasty and mercury for gold refining to the South Song Dynasty [43]. Ethnonyms such as *Aesin* (愛新 gold) and *Mongol* (蒙古 silver) highlight how northern tribes valued metallurgy, as do the exquisite metalworks of the Scythians. Korea also developed the world's first silver separation technique in the Joseon Dynasty in 1503, extracting pure silver from ore using lead separation.

Silla's goldsmithing, especially in inlay, filigree, and granulation, achieved global acclaim for its precision and beauty [44]. Exemplary works include the gold-inlaid sword from *Cheonma-chong* Tomb, horse saddle, and the ring-pommeled sword from *Magap-chong* Tomb, *Gyeong-ju* [45]. Granulation required meticulous temperature control and chemical bonding techniques. Metallurgical advancement is further evidenced by Silla's office departments such as the *Tan-Jeon* (炭典 coal) and *CheolYu-Jeon* (鐵鑪典 iron & brass). Goguryeo, too, had a robust mining system relying on enslaved labor to extract gold, cinnabar, tin, copper, iron, crystal, marble, and granite for tools, weapons, and construction. The bronze swords, spears, mirrors, horse bridles, god statues, and beads excavated from the *Gwan-seo* (關西) region of North Korea display an exceptional level of craftsmanship [46].

Methodology

This study adopts an interdisciplinary approach, integrating iconographic, cross-regional comparisons, material technology, non-Chinese sources, and archaeological data in East Asian studies. We analyzed the symbolism of Silla's human-face inlaid glass bead to interpret the shamanistic worldview, the afterlife, and the level of technological civilization in the Silla cultural sphere. We examined that neighboring countries such as the Huns, Tibet, and Silla possessed more advanced elements than China, such as metalwork and glassmaking technology. In addition, it adopted the non-literal historical interpretation method (*History from the Margins*) to

reflect the cultural tradition logic such as traditional crafts, folk beliefs, and shamanism.

We investigated the materials, forms, etc. of bead artifacts among the domestic collections of the National Museum of Korea through the internet. Since glass bead production is closely related to metalworking and heat treatment technology, it comprehensively analyzed the metalworking technology of the Bronze and Iron Ages. Also, we conducted a wide range of investigations, including domestic and international glass bead sites, glass workshop remains, government office names, glass components, and distribution.

In addition, in order to understand the cultural exchange aspect of ancient glass beads and ornaments, a multi-source comparative analysis was conducted. Recognizing that existing China-centered historical books are ‘*interpreted history*’ composed by political purposes and ideological bias, various perspectives are cross-examined based on a critical perspective [47]. Accordingly, non-Han historical records such as the Huns, Mongol, Buyeo, and Dong-Yi, archaeological artifacts, and records from neighboring countries were reviewed. Furthermore, the possibility of technological and style exchanges with Southeast Asia, India, Indonesia, Vietnam, and Japan was examined. Navigational and technical data from Arab and Southeast Asia, especially glass beads, metal ornaments, trade goods, shipbuilding, and navigational techniques from the maritime Silk Road trade route between ancient East Asia and Southeast Asia, were traced, and the mutual influence relationship between the Indian and Southeast Asian cultural spheres and ancient Korea were analyzed multi-layered. Also, by comparing and analyzing the period of national establishment, ornament wearing practices, technique exchanges and interactions of neighboring countries, we explored the *Hallyu* of ancient Korea through the exchange of ancient glass beads.

Results & Discussions

1. Analysis of the symbolism of Silla face-inlaid glass bead

As a result of sketching the four faces in the beads (Fig. 2a-d), the four faces are identified as different people. While white faces and round eyes have been seen as signs of northern Caucasians [48] or Roman royalty [2], this view is doubtful, as white is used uniformly for faces, hair, flowers, trees, and birds, indicating a symbolic choice rather than ethnicity. According to the *Samguk Sagi*, there is a record that the face of Silla *Kim Chun-chu* is white, and the *Hwarang* (花郎) makeup also paints the face white (三國遺事). A white face signifies purity and divinity, and white is an important color for Silla, Xiongnu and the Dong-Yi people, and it has the meaning of purification and divinity. Dark blue and black, which northern & eastern people of ancient Asia often used to symbolize the sky, were used as the background color of this bead. The round eyes symbolize the celestial gaze or foresight, and are spiritual eyes that see through everything. The straight nose is the central axis, representing spirit. The two lines on the neck are not the two wrinkles on the Buddha's neck [11], but are believed to represent the jawline of face and a necklace.

The four figures are identified as the faces of four ancestors wearing gold

crowns. Unlike Buyeo' accompanying burial *Sunjang* (殉葬), *Eastern Okjeo* practiced a secondary burial, in which only the bones were reburied. A single chamber held the bones of an entire family, along with wooden figurines carved to resemble each deceased individual [49]. From the beginning of the Paleolithic facial sculptures [3], various faces have been discovered in Korea. The skull-shaped jade carvings of the *Hongshan* culture (Fig. 2e) and the gilt-bronze face masks of *GoJosun* (Fig. 2f) are thought to share a common thoughts of face. A gilt-bronze human face mask from Buyeo (2nd–3rd century) and excavated in *Jilin*, features a topknot, prominent cheekbones, earring holes, and an open mouth — characteristics typical of northern facial. In the word face '*eolgul* (얼굴)', '*eol* 얼' means soul or spirit, and '*gul* 굴' means a gathering place. Therefore, 'face' is interpreted as an expression of the soul or spirit in Korean tradition.

The topknot and crown decoration of the figure in the bead are traditional Korean elements. The topknot is seen as a connection to the sky, or communication with the divine [10]. The crown decorations on both sides can be seen as golden flower decorations attached to the crown. The *Baekje* (百濟) king wears a purple robe with large sleeves and blue silk *Geum*(錦) pants, a black silk crown (烏羅冠) decorated with gold flowers, and black leather boots with a white leather belt (*Old Book of Tang*). The gold crown decorations of the king and queen excavated from the Tomb of King *Muryeong* of Baekje (5th ~6th century) are complex shapes such as flowers, flames, and sunlight (Fig. 2g-h). This tradition dates back to GoJosun. The *Nang-ga* system of the *Dangun Era* was to establish schools (扁堂) to educate unmarried young people. When students (國子郎) went out, they would put flowers (天指花) in their hair, so people called them *Cheon-Ji Hwarang* (天地花郎) [24].

Ancient Korea produced more faces and animal figures than human figures [21], and in particular, expressing them with open mouths is a characteristic of the Scythian animal style [50]. The four faces and six white birds in the beads all have open mouths. This can be seen as an extension of religious daily life such as incantations or singing.



Figure 2. Korean faces & firing flower of crown decoration, bird crowns of Silla & Xiongnu.

- a-d) Sketches of 4 faces with open mouth from the research bead (author's drawing)
- e) Skull Jade sculpture from the collection of Hongshan culture
- f) Gilt-bronze mask from GoJosun Buyeo people with hair topknot and open mouth and pierced ears (length 27.4cm, *Jilin*)
- g-h) Crown gold decoration plugged in on both sides (National Treasure #154 & #155, height 30.7cm & 22.6cm, *Gongju*)
- i) Falcon jade ornament of gold crown of Xiongnu (*Hohhot*, Inner Mongolia Museum)
- j) Bird in gilt-bronze crown from stone chamber Tomb (*Ipjeom-ri*, *Iksan*)

White birds are considered guides of the soul and messengers of the gods in Dong-Yi shamanism. The bird shape has religious meaning and was used a lot in ceremonies and rituals [51]. The falcon-jade-decorated Hunnic gold crown excavated from Ordos, Inner Mongolia, shows that the northern Huns and Silla had the same tradition of wearing gold crowns and worshipping birds (Fig.2i) [52], and the gilt-bronze crown excavated from the *Ipjeom-ri* stone chamber Tomb has a bird pattern with spread wings (Fig.2j).

It is also noteworthy that all six birds have spread wings (Fig. 3). The northern and Dong-Yi people regarded birds as spirits of the sky and erected totem poles, and when birds were used as patterns, they were mostly depicted with spread wings. There are totem poles in Korea, Manchuria, Mongolia, and Japan. The reason the totem pole is a migratory duck is because it was believed to act as a messenger between the sky, the earth, and the underworld. A two-bird totem pole appears in the farming-scene bronze of *Goejeong-dong*, *Daejeon*, which is estimated to be about 3,000 years old, and a large quantity of duck-shaped pottery has also been excavated in the *Nakdong River* basin [53]. In the *Samguk Sagi*, there are more than 28 records related to the color white. Since ancient times, white was considered a good omen, and when a white animal was obtained, it was presented to their king.

The three symbols of the golden culture of the steppe nomads are trees, birds, and deer, and the Silla gold crown includes all of these design elements. In particular, the gold crown excavated from *Seobong-chong* Tomb is decorated with many birds.

This bird worship culture religiously supports the motive and background of the production of glass beads with human faces. It is also said that *Kim Al-zi* of Silla came from a box hanging on a tree where a white rooster was crowing, and not only dragons but also roosters were considered spiritual beings [54]. According to the *Sanguozhi Dong-Yi-Jeon*, there was a long-tailed rooster in Makhan (5尺 = 150 cm long), and they worshiped the long-tailed rooster as an incarnation of the phoenix. In addition, the Goguryeo murals depict high the roosters with comb, and Goguryeo was called ‘*Kukkuteśvara*’ in India [55].

Early Silla was also called the ‘land of birds, or the land of chickens’ and King *Talhae* of Silla also named the country ‘*Gyerim* (鷄林)’, and the ‘Silla (새나라)’ also means ‘bird country or new country’. Also, “The people of *CheonChuk* (天竺 India?) called the people of *Haedong* (海東 Silla) ‘*Gugutak Yeseola*’, and *Gugutak* means chicken and *Yeseola* means precious people”. It is said that the people of *Haedong* respected the chicken god and decorated themselves with its feathers [54].

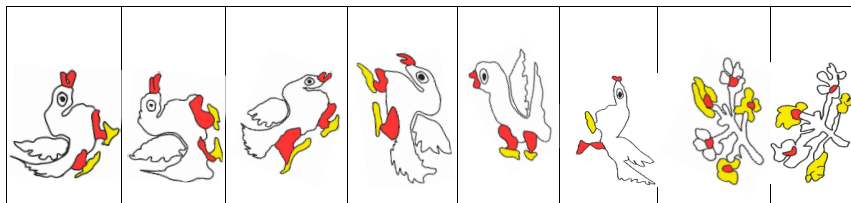


Figure 3. Sketches of 6 birds & 2 flower trees from the research bead (author's drawing)

The style of expressing birds and flowers together is a tradition based on naturalism in ancient Korea. The flower-tree pattern in the inlaid glass bead expresses the vitality of a tree with fully bloomed flowers (Fig. 3). In the north, where trees are uncommon, there is a tree cult that regards them as sacred [37]. Seven branches extend symmetrically from the central stem, and flowers bloom at the ends of the branches. 7 branches seems to refer to the ancient Korean Seven Stars belief (七星神仰) of Shamanism. The Silla gold crown also has a sacred tree in the shape of ‘出’ with deer antlers, and phoenixes, *gogok*, and small discs hanging from it. In addition, most of the numerous relics in the *Shoso-in* in Japan are Silla-related relics [56], and many motifs are in the shape of the letter ‘出’. The same style of sacred tree is also expressed in silk from Noin-Ula, Mongolia and in wool carpets from the Pazyryk Tomb.

In the North, sacred trees were often used together with Scythian animal style. Not only composite materials but also common designs show that the Noin-Ula, Pazyryk Huns and Silla shared a symbolic value system. The Silla Kim clan had Xiongnu ancestors, which is supported by the stone record that the Silla Kim royal family “Descendants from *Seong-Khan* (星漢 / 聖韓).” By focusing on the pattern of inlaid-glass beads, the aspects of ancient cultural exchange can be specifically identified through the origins, technique, aesthetic sense, and ritual characteristics shared by the two cultures.

2. Types of inlaid glass beads and their exchange

Two inlaid glass beads excavated from the *Sik-ri chong* Tomb in Gyeongju are also rare treasures with complex patterns. The blue solar-universe eyeball inlaid bead has yellow & red suns and swirling layer of clouds (Fig. 4a). The star-wreath inlaid bead has a yellow star on a green background, and the donut/tube-shaped wreath shapes are unique with an elaborate color arrangement of 3-4 colors (Fig. 4b). In addition, a green star-inlaid glass bead and a blue eyeball-inlaid glass bead were discovered in the *JJoksaem* district in Gyeongju (Fig. 4c). There are similar star-inlaid glass beads among the Jatim beads from Java Island, but they are somewhat less artistic and elaborate. And the eyeball inlaid glass beads from Java are similar to the eyeball inlaid glass beads from Altai and Gyeongju.



Figure 4. Four inlaid glass beads of Korea and their exchanges to the world
 a) Blue solar-universe eyeball-inlaid bead & pattern sketches (*Sikri-chong*, Gyeongju)
 b) Star-wreath inlaid bead & pattern sketches (*Sikri-chong*, Gyeongju)
 c) Green star-inlaid bead & blue eyeball-inlaid glass bead (*JJoksam*, Gyeongju)
 d) Mold for comma-shaped *gogok* (*Busan*, total length 5.4 cm, thickness 1.2 cm)
 e) GoJosun 8-*Juryung* (bronze of 8-bead bells, *Hwasun*, total diameter 12.3 cm)
 f) Altai eyeball inlaid glass bead (*Pazyryk*, BCE 10~8th centuries)
 g) Drawing of face-inlaid glass bead & unfolded view (*Inamori* kofun, Japan, late 6th century)

The discovery of unique Korean curved-bead *gogok* molds in *Seonam-dong*, *Gwangju*, *Dugu-dong Busan*, and *Hwangnam* great Tomb, Gyeongju (Fig. 4d) has proven that Korea manufactured glass beads on its own [36]. Due to the great popularity of beads in GoJosun before Silla Dynasty, the bronze bells in 8-*juryung* are in the shape of beads (Fig. 4e). The shaman would have contacted the ghost by making the sound of a bell that the ghost likes. This 8-*Juryung* was also be found in the shaman costumes of the Ewenki people.

In the Pazyryk culture (Gorny Altai), eyeball-inlaid glass beads from around the 10th to 8th century BC were excavated (Fig. 4f), and similar later ones were excavated along the Silk Road in Central Asia. Specially, another face-inlaid glass bead with similar design elements and colors such as faces, flowers, and birds, but of lower artistic and technical quality (Fig. 4g) was excavated from the Japan's *Inamori* Tomb, which is a large keyhole-shaped tomb over 100 m in length, built in the late

6th century, along with bronze bell, bronze mirror, gilt-bronze sword, and others. This bead is told from a private collection and currently missing, but the sibling artifacts, gold ring and gilt-bronze crown, are said to be Silla products [12]. The fact that similar glass bead has been found in the Silla cultural sphere of Japan also proves that Silla directly produced the research glass bead of this study.

3. Diversity of Korean Glass Beads and Outsourcing

The Korean people began using stone beads and jade beads in the Neolithic Age [3], and in the metal age, they were also produced using slag, a by-product [57]. Pure silica melts at a high temperature of about 1,700°C or higher, and many transparent glass beads, like crystals, that evidence high-temperature processing or special techniques have been excavated in Korea. The main component of glass is silica, which melts sand, and the melting point can be lowered by mixing additives such as natural soda, wood ash, and limestone [58].

Those that use sodium as an additive are classified as soda glass, which is mainly found in the West. Potash glass mainly uses bamboo leaf ash as an additive of potassium oxide (K₂O) [59], and is mainly found in Indian and Southeast Asian glass beads, so it is called Indo-Pacific glass beads [60]. Lead-barium and lead-additive glasses exist in the *Gyodong* Peninsula, the southeastern coast of the continent, and Korea. By the way, all of the above types have been excavated in Korea since the early Three Kingdoms period [61]. Among the domestic excavated artifacts, glass-related artifacts are the most numerous along with bronze and ironware.

Beads collection of the National Museum of Korea confirmed that various beads were made with various materials, shapes, and techniques. Bead materials included earthen, stone, jade, shell, wood, white clay, silver, gold, bronze, gilt-bronze, iron, celadon, white porcelain, and *buncheon*. In particular, there were the beads of composite materials, and lacquering or surface processing techniques that bond heterogeneous materials are essential. And the shapes included polyhedrons such as gourds, twins, coils, octahedrons, and hexahedrons, square, animal shapes, ovals, concave, cone, cylinders, *jang-gu* drum, tops, pinwheels, bowls, *yidang* (耳環).

Including triple-gilded glass beads, beads with multiple beads attached, polyhedral beads with jewels attached to six sides, and striped, colored beads with a pattern of colored beads, there were various manufacturing techniques for glass beads, such as rolling them thinly and winding them, inserting colored strings, inlaying wave patterns, making petals, cutting vertically or horizontally, cutting them round, combining two colors, swirling, dotting, coating, gold-foil, and porous [10]. This diversity of beads means that beads were used as a part of daily life. Also, the region where the beads were created was likely a talisman containing religious beliefs rather than a symbol of status. In other words, beads symbolized the spirits and minds of ancestors, the sun, eggs of sacred birds, divine powers, or wishes, so they were essential items for ancient Koreans.

Glass workshops are found throughout Korea. The *Wanggung-ri* site in *Iksan* was a workshop that produced gold, glass, and bronze products, the *Hwangnam* great Tomb in Gyeongju produced glass, bronze, and lacquerware, and the *Guhwang-dong* site in Gyeongju produced glass and bronzeware. Silla's industrial production was

carried out by naturalized semi-slaves and slaves. Various handicraft sectors in government offices included the world's best pattern-dyed *JoHa-Ju* ikat silk office, *JoHa-bang*, and brocade *Geum* silk office, *Geum-Jeon* [62], as well as lacquerware office *Chil-Jeon*, iron-bronze ware office *Cheolyu-Jeon*, shipbuilding office *Seon-bu* (船府), and *Japgong-sa* (雜工司).

'*Japgong-sa*' was also called *Namhaso-gung* (南下所宮) and manufactured small crafts such as gold, silver, jade, and glasses [46]. Incidentally, the name of the Japanese glass office of the immigrants was also '*Japgong-ho* (雜工戸)' [63]. In addition, inlaid glass beads were excavated from *Nara* and *Kobe Hyogo* where Baekje Silla people resided [64], and gold-leafed glass beads were found from *Osaka Takadayama Tomb* and *Nara Ishinokarato Tomb*. Circular crystal beads are excavated in large quantities, especially in *Nara*, and simple-shaped or round and flat glass beads were also excavated in thousands at once. Therefore, it is inferred that Silla spread the glass bead production technology to Southeast Asia and used it as a production base, just as the *Japgong-sa* and *Japgong-ho* are similar. It is said that most of the glass beads excavated in Indonesia are estimated to be from the 6th or 7th century [65], and it is also said that most of the artifacts in the Java National Museum were imported from overseas.

4. Shipbuilding technique of Baekje

In the 5th and 6th centuries, Baekje was a maritime state that interacted with Southeast Asia [65]. That is, it actively traded with Palembang and Java in Indonesia, Cambodia (*Funam*), and Oc Eo in Vietnam (Fig. 5a). Baekje was called *Baek-Ga-Je-Hae* (百家濟海), meaning "100 ships from 100 families rule the sea." The fact that Baekje occupied *Dammora*, which is presumed to be Taiwan, indicates that it had great maritime power [64]. In the early days, Baekje had much stronger control over Southeast Asia than the Central Plains and Silla. It is understood that the envoys from Southeast Asia who appeared in the *Portraits to the Liang Court* (梁職貢圖 523–536) of the 6th century had come over the Court, using Baekje ships (Fig. 5b).

Looking at the ship technology of the ancient times, the world's oldest log boat discovered in *Bibong-ri*, Korea, dating back 8,000 years (Fig. 5c) is not made of animal skin or a raft, and is similar to that discovered in *Yangjeo* old castle (良渚古城), where the Dong-Yi *Huai-Yi* (淮夷) people lived. The *Ulju* petroglyphs depicting various whale hunting scenes and the stone mold making large fishhooks attest to the shipbuilding technology that once went far out to the ocean (Fig. 5d).

In particular, King *Muryeong* of Baekje (r. 501~523) implemented the *Damno* system (擔魯—ruled by royal kin) to expand its territory, and also maintained close relations with *Daehwa Wae* (倭) and the Central Plains. It was recorded in a national letter to the Liang Dynasty that "(Baekje) has become a powerful country again." Baekje had '*Damno*' in 22 places (Fig. 5e), which is recorded in the *Portraits to the Liang Court* and the *Nihon Shoki*. '*Damno* (擔魯 淡路)' are closely related to the Goguryeo '*Damul* (多勿)' and *Dammora* as well as GoJosun '*Dangun*' [64].

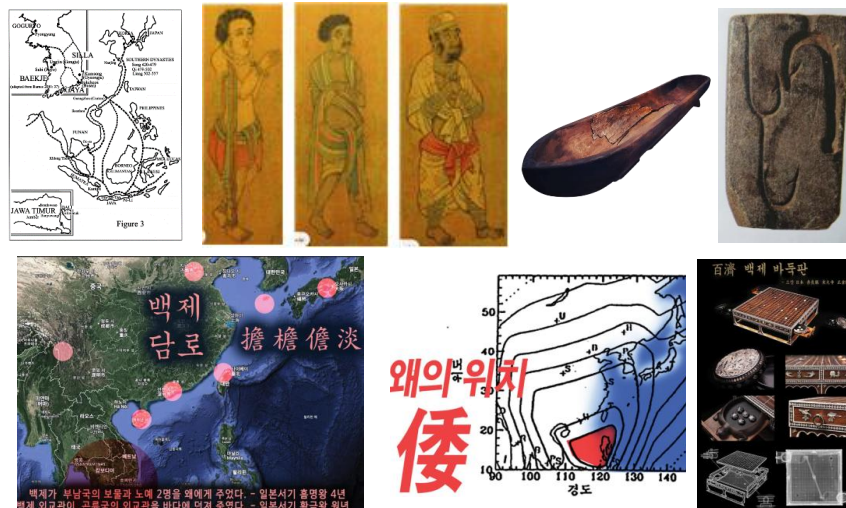


Figure 5. *Baek-Ga-Je-Hae* Baekje & Evidences proving Sea skill of GoJosun
a) The Maritime Silk Road from Baekje, 5th ~6th centuries [65]
b) Envoys from Southeast Asia & Wae (Portraits to the Liang Court, 526~536)
c) 8,000-year old log boat (*Bibong-ri*, length 3.0 m × width 0.6 m)
d) Mold of fishing hooks (*YeongAm*, 11.93 × 7.05 × 2.17 cm)
e) Part of Baeje *Damno* found according to the names of current places [66]
f) Location of Wae analyzed through eclipse records of *Nihon Shoki*
g) Elaborate structure of Go board of the Baekje (Southeast Asian's sandalwood and ivory, *Shoso-in*, Japan)

Wae is understood to be the current Philippines region, based on the 11 records of solar eclipses recorded in the *Nihon Shoki* (Fig. 5f) [66]. This is also consistent with the records in literature (*Hou Hanshu* and *Book of Sui*) that “Wae is close to *JuAe* and *Dam-Yi*”. Since *Il-bon* (日本) and Wae (ancient Japan) appear separately in the Dong-Yi records, it is important to note that they were different regions before their federation [66]. In addition, Baekje had a close relationship with Wae [64], and the elaborate checkerboard (with ivory eggs) made of the sandalwood from Southeast Asia reveals Baekje's maritime control as well as brilliant cultural level (Fig. 5g).

The fact that Baekje and Silla had maritime exchanges at the Southeast sea from early on supported that their shipbuilding technology was developed. And literary records support this (Table 1), the word ‘*Seon Bak* (船舶)’ (495), which refers to a large ship of Baekje, appeared in *Book of Southern Qi* (南齊書) from the 5th century, and also appears at Silla (505) in the *Samguk Sagi*. United Silla took over the techniques from Baekje and gradually developed its shipping department. By the 7th century, the ship division of Silla was independent from the Ministry of War and the maritime Silk Road ships were completed.

Table 1. Records about large ships of Baekje and Silla (*Book of Southern Qi & Samguk Sagi*)

Baekje (南齊書, 495)		Ship (船舶)
Silla (三國史記)	King Jijeung r.6 (505)	Ship (船舶)
	King Jinpyeong r.5 (583)	Establish Ship-building Department (船府), and appoint a chief inspector (大監) and inspector (弟監).
	King Munmu r.18 (678)	Ship-building Department under the War Ministry (兵府), was made independent and a Commander (船府令) was appointed.
	King Shinmun r.8 (686)	The highest officer (船府卿) was appointed in Ship-building Department.

Ship-shaped potteries were discovered in many places, such as *Geumnyeong-chong*, Gyeongju and *Hyeonpung*, Gyeongbuk, and are the type of oceangoing ship with a square head and square hull that is high in the front and back. The *Kunlun-Seon* ship that appears in the relief of the Bodobudur Temple (8~9th century) in Java, Indonesia [22], is similar to this ship type with three or more sails. Ships from various regions were anchored at Guangzhou Port, and the largest *Kunlun-Seon* ship [67] was confirmed to be a Silla ship [21]. And the Silla ships (新羅船) of *Jang Bogo, the maritime king* (赤山法華院 *Chishan Fahua Temple - Shandong*) were mostly medium to large in size [68], and took the lead in the maritime Silk Road.

Unlike Baekje, Wae Japan, which had coastal navigation skills, even had difficulty navigating from *Daema-do* (*Tsushima*) to Kyushu [68]. Until the early 8th century, Japan had to receive help from Silla to go to the continent. After winning the unification war in the 7th century, Silla controlled at Kyushu *Dazaifu* [69], and Baekje's excellent shipbuilding and navigation skills were absorbed by Silla. The large ships built in Japan's *Aki* Province during the *Kōtoku* period (7th century) were called *Baekje-Seon* ships (百濟船), and the boar-named ship (*Jeo-Mung-Seon* 猪名船) was built by Silla craftsmen. Even in the 9th century, *Dazaifu* in Kyushu built *Silla-Seon* ship and its excellence was highly praised. For this reason, Japan made sure to pass down the actual "Silla ship" [70]. The Baekje 'Go board' and Silla treasures in the Japanese Imperial Treasury's Shoso-in, as well as incense, medicinal herbs, and ivory from Southeast Asia, speak of Baekje and Silla's maritime dominance [71].

At that time, Silla ships were far ahead of Western ships in terms of manufacturing methods, size, sails, and rudder. Incheon *Yeongheung-do* ship relic seems a flat-bottomed ship of Silla in the 8th century, made by connecting several logs together, and is a traditional Korean ship, *Khan-Seon* (韓船). Silla also built a deep-bellied, high-decked maritime vessel with a round bottom that was advantageous for ocean voyages, and these Silla ships, including the *Wan-do* ships, were used during the Jang Bogo period (828).

Silla was the best in the world in terms of shipbuilding and navigation, followed by the inland Tang Dynasty, and Japan, despite being an island nation, ranked last [67]. The Silla people were not only skilled in shipbuilding but also in navigation, and based on this maritime ability, *Jang Bogo* of Silla took control of East Asian maritime trade. *Jang Bogo*, from Xuzhou (徐州) *Munyeong-gun* military, named after King *Muryeong* of Baekje, sailed all the way to Persia in 834 [72]. According to Goryeo record (高麗史), Goryeo ships were so large (96 尺 about 30 m) that horses could run on the deck. In the year of 1208, while other ships were wrecked by a storm, only Goryeo ships of *Ma-Do-Seon/Jo-Un-Seon* were safe. And the *Naju-Seon* ship relic discovered in the *Yeongsan* River in 2004 is estimated to have been a large warship measuring about 30 m long [73].

It is generally known that the approximately 18 glasswares excavated from Silla's 4th~6th century Tombs, including the *Geumgwan-chong* Tomb, *Seobong-chong* Tomb, *Cheonma-chong* Tomb, and *Hwangnam* great Tomb, as well as the glass products at the Shoso-in in Japan, were told as Roman Byzantine glass and Persian glass introduced through trade with Arabian merchants. However, the period of trade between Silla and Arabian merchants was much later, and does not match the estimated date of the tombs. According to Arab historian Mas'udi's masterpiece, < *The Meadows of Gold and Mines of Gems* >, around the 9th century, Chinese merchant ships loaded with rare goods entered eastern Arabia and the Gulf Sea to trade, and Ibn al-Kalbi said that a Chinese market was formed in Muscat, the capital of Oman [7]. However, 'Chinese' here are believed to Silla people, who had excellent shipbuilding and navigation skills. The Tang Dynasty lacked the shipbuilding and ocean navigation techniques, which only began to develop significantly and suddenly during the South Song (960–1279).

Also, it is said that the Chinese mainly used the northeast monsoon in winter to depart from Guangzhou in the southern Guangdong region and head to the Arabian Sea, and repeated the return voyage using the southwest monsoon that blows between April and October. And it was more economically practical to use India and Southeast Asia as intermediate bases for trade than to travel directly. Arab-Persian merchants also initially used Kerala on the Malabar coast of India, Sri Lanka, Malacca, the coast of Sumatra, and further north, Champa in southern Vietnam as bases, rather than going directly to China, to gain the benefits of intermediate trade [74]. Likewise, it is reasonable to view here 'Chinese' as the Silla people, not the inland Plains people of Tang. At that time, the West could not distinguish between the Tang people and the Silla people. It is a common phenomenon that ancient Koreans are mistaken for Chinese, and this Sinocentric way of thinking and interpretation needs to be corrected urgently.

5. Exchanges with Southeast Asia since the Neolithic Age

Glass beads were among the trade items of the Silk Road. The origin of the inlaid glass beads excavated along both the steppe and maritime Silk Roads is believed to be the Kim clan—a kind of Xiongnu Yuezhi—who was highly skilled in commerce [17]—and later, those who migrated eastward, part of Silla. Considering their access to Central Asia via Makhani Goguryeo, as well as their inheritance of Baekje's advanced maritime navigation skills, Silla is the most plausible common

origin of the bead. Silla, which inherited the Hongshan jade culture and blossomed into a brilliant civilization, is regarded as the starting point of both routes of the Silk Roads.

The gilded glass beads with a three-layer structure of glass-gold leaf-glass are widely distributed not only in *Cheonan Cheongdang-dong*, *Naju Bannam-myeon*, *Gyeongju Geumgwan-chong*, and *Gongju Muryeong Tomb*, but also in West Asia along the eastern coast of the Mediterranean Sea, Egypt, Central Asia, the Black Sea coast, Scandinavia, Java, Southeast Asia, and Japan. Also gold polyhedral decorations are also relatively widely distributed, including Korea, Vietnam, the Philippines, and Indonesia [12].

They would have been made in places rich in gold, and medieval Arab merchants described Silla as a utopia rich in gold. Islamic geographer Ibn Khurdadbeh (late 9th century) recorded that even the snood of dogs and monkeys in Silla was made of gold. In particular, it was said that if you sprinkle water in house of Silla people, it will give off the scent of expensive ambergris and all diseases will disappear, and once you enter Silla, you will not want to come out [67].

The so-called 'Indo-Pacific beads' are believed to have originated from Arikamedu, an ancient maritime trade center located on the southeastern coast of India, and traded with Rome and Indonesia [60]. However, since they originated in port, it is more reasonable to view them as foreign artifacts rather than their own culture. The Indo-Pacific glass beads date relatively late, after around AD 500. In addition, this is a region that uses Tamil language, which is similar to Korean in terms of vocabulary, grammar, and number notation. In addition to this region, 80 million Tamil speakers live in Sri Lanka and Singapore. It is possible that these similarities are traces of ancient exchanges [75].

Moreover, it should be noted that India and Southeast Asia established their states relatively late. The elements of an ancient state must be based on the legitimate use of force and a centralized bureaucracy, and other indispensable elements include laws, long-distance trade, class differentiation, specialized skills and occupations, tax collection, military service, and metallurgy [76]. Indonesia, situated at the crossroads of the Silk Road, was rich in spices, wood, tin, and ore, but lacked advanced metalworking technology. The islanders reportedly exchanged ambergris for ironware from passing ships using rafts [77]. Contrary to the belief that India colonized Southeast Asia, historical accounts suggest otherwise. In ancient Gujarat, it was said that those who went to Java rarely returned — but if they did, they brought back enough wealth to support seven generations [76]. This supports the now widely rejected theory of Indian colonization. Instead, the Indianization of Indonesia is understood to have been led largely by Southeast Asian elites who aligned themselves with Hindu or Buddhist traditions, aided by capable foreign teachers already present in the region [76]. Accordingly, Arikamedu and Java are understood to have been places where advanced products from Silla and Baekje were produced outsourcing.

The Indo-Southeast Asian exchange network, active by the 1st and 2nd centuries CE, stimulated not only trade but also political and cultural development [78]. In this context, the exchange with Silla or other northeastern regions surely predates this [76]. The Southeast Asian seas, dotted with islands and influenced by monsoon currents, facilitated long-standing interactions with Korea and the

Southeastern continent, dating back as early as 4,000 BCE. Evidence includes Neolithic sites in the Taiwan Strait, obsidian and jade from Borneo, and jade artifacts in the Philippines and Indonesia. Notably, jade earring linked to Hongshan culture were excavated from the Sa Huynh site on Vietnam's central coast [79].

6. Ancient exchanges through the glass beads

When Arab merchants arrived in Southeast Asia, they met Silla merchants and visited Silla, calling it a utopia. Historically, Silla merchants used the monsoon winds and ocean currents to sail the sea, making a round trip once a year and exchanging advanced products to the Southeast Asia. Persian merchants recorded that Silla was composed of both a civilized area of utopia and an uncivilized 'Vaq Vaq' island of a naked queen and people [80], which is understood to have been a pronunciation of the *Wae-gu* (倭寇/倭國). According to the 'The Canon of Medicine' (11th century), it is written that 'Silla is located at 170° east longitude and 5° north latitude, islands in the east Sea, comparable to the islands of eternity and fortune. It is full of useful goods' [81]. By the way, 5° north latitude corresponds to the location of Sumatra, Indonesia.



Figure 6. Silla location, represented with several islands on an Arabic map, means its maritime trade cities

- Silla, six islands shown on the Al-Idrisi map (1154) [81]
- Part of Silla near *Cheon-Ju* (泉州 Fuzhou 福建省) & the current Taiwan (up)
The current *Silla-gu* county in *Cheon-Ju* (down) [66]
- Nine neighboring hostile countries around two Silla (서신라 & 동신라) expressed in *Hwangryong-sa* pagoda (AD 643, before the unification of 668) [66]

In Al-Idrisi's world map (1154), Silla is depicted as six large islands [81] (Fig. 6a), which is interpreted as evidence of its maritime reach, including territories in Japan and Southeast Asia. It is written as *al-Sila*, and other record as *Basila* (باسلة), and here *Ba* might mean 'west' in Indonesian (*barat*), in Turkic (*batı*), and Arabic (preposition), etc., these support the theory that the continental coast and islands are 'West Silla'. Before the 7th century, Silla migrants had already settled across Japan—in *Hamoya*, *Mujang*, *Minong*, *Geungang*, and *Junha*—preserving their surnames and forming Silla communities [82]. Silla absorbed Baekje's *Damno* and flourished with iron, gold, and silk production.

Silla settlements also spread along the southeastern coast of China,

particularly in *Gyodong* and *Jiangsu* (江苏), from where it controlled the Yellow Sea and expanded further south into *Fuzhou*, *Zhejiang*, and *Guangdong*. When Goguryeo people took *Wolju* (from Baekje), they relocated Silla people to *Cheon-Ju* (Quanzhou 泉州) (Records from 528 CE, *Taebaek-Ilsa Goguryeo-Bongi*) [66]. This aligns with accounts in the record of *Zhu Fan Zhi* (諸蕃志) and Arab sources stating that "the Silla country faces the sea gate of *Cheon-Ju*" [43, 81]. And the name "*Silla-gu* (新羅區)" remains in modern Quanzhou, Fuzhou Province (Fig. 6b).

By the 8th century, with improved navigation and route knowledge, coastal cities such as *Yangzhou*, *Guangzhou*, *Fuzhou*, *Hangzhou*, *Mingzhou*, and *Quanzhou* became international trade hubs. *Mingzhou* was the main port of Silla's ships, and ships from Balhae and Goryeo also waited for the seasonal winds here [83]. Silla thus controlled key ports along the southern maritime route, and Islamic merchants departed mainly from *Guangzhou* and formed communities in five major cities, including *Quanzhou* and *Hangzhou*.

In these trading regions—Zhejiang, Fuzhou, and Guangdong—Silla and Arab populations coexisted. Silla enclaves were called "*Silla-bang*," while Arab and Persian quarters were known as "*Fan-bang* (蕃坊)" [83]. Recent research argues that the so-called "*Silla-bang*" [12] was in fact 'West Silla,' the southeastern mainland region [66], and East Silla was the Korea peninsular. Support for this includes the nine-story *Hwangnyong-sa* pagoda, where Silla people symbolized each tier their neighboring hostile 9 countries—geographic analysis places these countries around two Silla both the southeastern continent and Korea peninsular (Fig. 6c). Here, Baekje-Goguryeo seem to be 'Ye-Maek' among the 9 countries.

Especially, the patterns of peasant uprisings further support this, especially after Silla *Jang Bogo*'s death, when Arab merchants gained trade dominance and tax privileges, provoking unrest. These tensions culminated in uprisings such as *Gu Bo*'s revolt (*Zhejiang* in 859) and *Bang Hun*'s (*Xúzhōu* in 868), and ultimately the massive *Huang Chao* (黃巢)'s Rebellion (876–884), in which an estimated 120,000~200,000 Arab and Persian merchants were killed [83].

Islamic sources also document strong interest in Silla. Ibn Khurdadhbih wrote: "Opposite *Khansu* (maybe Quanzhou/Cheon-Ju), at the tip of China, there is a mountainous country called Silla, rich in gold and divided into vassal states. Many Muslims have settled there for its many advantages, but no one knows what lies beyond" [81]. From the 9th to 15th centuries, Islamic historians and travelers—such as Al-Mas'udi—noted that Iraqis and Alawite refugees settled in Silla or Goryeo, some marrying into local society or participating in politics [83]. Arab writings idealized Silla as a paradise at the edge of China, with clean air, pure water, fertile lands, and healthy, beautiful people. It was even believed that the sick could be cured simply by arriving there [67]. As such, Silla became not only a trade partner but also a political refuge, associated with the utopian kingdom described in the Persian epic *Kushnameh* [84].

7. Silla's trade goods

Silla had traded with Arab and Persian merchants, who documented both their observations of Silla and the goods they imported from the kingdom in detail [67]. It is shown that Silla was superior in the craftsmanship of metal, fur/leather, sail

cloth and ceramics as well as silk Geum.

“Silla is mountainous, has many kings (persons who wearing crown), and is rich in gold. The goods produced there include colorful silk JuDan (綢緞), iron swords (劍), *kiminkhau*, musk (麝香), aloe (蘆薈), horse saddles, sable fur, ceramics, sail cloth (帆布), cinnamon, and *khulanjan*”, according to <*The Book of Roads and Kingdoms*> of Ibn Khurdadhbih (the 9th century) [21]. The fact that Silla exported sail cloths suggests that the sails on *Silla-Seon* ships were the first, which is evidence of Silla's outstanding shipbuilding and navigation skills at the time. And musk is closely related along the *ancient tea route* (茶馬古道), also known as the *Musk Route*. And notably, spices such as *kiminkhau*, *khulanjan*, cinnamon, and aloe were the specialties of the southern continent and Southeast Asia.

[In Goryeo] ginseng (人蔘)·mercury (水銀)·musk (麝香)·pine nut (松子)·hazelnut (榛子)·abalone shell (石決明)·pine cone (松塔子)·*fangfeng* (防風 Saposhnikovia)·white aconite (白附子)·poria mushroom (茯苓)·large (tent) cloth and small (shawl) cloth (大小布)·*mosi* fabric (毛施布, *mosi* means ramie not wool in Korean)·bronze chime bell (銅磬)·ceramics (瓷器)·straw mat (草蓆)·quality sable brush (鼠毛筆) were produced. The merchant wrote characters on five-colored silks and set them up (as signboards) in the ship to conduct trade (*Zhu Fan Zhi*, 12-13th century, South Song) [43]. It is noteworthy that while two records of specialties of Silla and Goryeo, successor to Silla, include items originating from entirely different regions, except ceramic and metal products. For example, Arab records of Silla include plants grown only in the southern region as local products, whereas Southern Song records of Goryeo include ginseng, *fangfeng*, hazelnuts, and poria mushrooms that do not grow indigenously in south. These differences reflect, first of all, the different periods of writing, and secondly, the different needs and interests of the Southern Song and Arab peoples, third, Southern Song had no need to import southern goods of Silla.

Silla people had exported their specialties to the people residing in Japan, such as ikats of both *JoHa-Ju* (朝霞紬) and *OA-Ju* (魚牙紬), gold/silver metal items like the *Nu-eung-ryung* chime (鏤鷹鈴). Besides, Silla specialties included a wide range of goods: *Silla-muk* ink stick, paper, musical instrument, wool rug (毛氈), pine nut (松子), tangerine (密汗), red lip balm (*kouzhi* 口脂), books (經卷), Buddhist altar items (佛具), bronze mirror (鏡), weighing pan (鈞), and tray and chopsticks set (盤箸), and *Sahari Bangjja* bronzeware (佐波理加盤) [67]. Here, it is clearly recorded that tangerines of south product was Silla's specialty. It is told that Silla engaged in intermediary trade in spices from the South and medicines from Persia [67], but as mentioned above, those were recorded as the specialty goods from Silla, which was a maritime empire. Also Silla was a six-island state, including West Silla, and included a location 5 degrees north latitude. Silla was geographically advantageous for trade between Tang and Japan [85]. From the fact that King *Munmu* of Silla sent two boxes of magnet to King *Gaozong* of Tang (*Samguk Sagi*, 669 AD), ‘*La Chim Ban*’ (羅針盤 羅盤 the compass) of iron magnet, the abbreviation of ‘*Sil-la Chim Ban*’ [86], had made Silla golden utopia through its global-trade navigation. On the other hand, the West was influenced by Arabs and developed the compass in the 12th century.

This *Hallyu* is supported by the fact that the artifacts of similar styles are

commonly found in both Southeast and Central Asia, centering Korea, such as the inlaid glass beads, resist-yarn-dyed textiles. Ikat from Southeast Asia, kasuri of Japan, and Adras from Central Asia Uyghurs, centering *Hilmun-Geum* of Goguryeo and *JoHa-Ju* from Silla, had shown similar amulet patterns, because of bird-totem Dong-Yi (*Jo-Yi* 鳥夷) people's identity, worldview, and aesthetic sense [87].

Conclusions

This study examined the subject of production and cultural significance of the Silla human-face inlaid glass bead through their symbolism and ancient exchanges. As a result, it was revealed that this artifact was produced with Silla's unique technique and symbolized the northern region, and that Silla also traded with Arabs and Persians and established bead production bases in both Southeast Asia and Japan based on maritime technology.

First, Silla face-inlaid glass bead condense the unique Korean topknots, gold crown decorations, white birds, and sacred tree, as well as the founding myth of Silla, the animal forms & open mouth of the North, and the symbolic system of shamanism. The belief system that identifies bird and sun gave rise to the idea of egg worship, and the elements of human figures, divine beasts, and tree gods reflect the natural worldview of the Silla people, and show that they were political and religious symbols that concentrated the sacredness of the royal family and ancestor worship. The inlaid technique is a unique Korean tradition, and the 360° inlaid technique that delicately inserts patterns inside the beads is a unique production style that is hard to find anywhere else in the world. This reflects the worldview and cosmology of the Silla people at the time, considering *Dangun Cheon-Ja* and the sun as the same.

Second, in terms of production technology, it is understood that the bead was produced from the glass-craft tradition that originated from the excellent metalworking techniques of ancient Korea that continued from the Bronze and Iron Ages. In particular, the use of slag, clay molds, and clear glass production were already widespread during the Three Khan and Three Kingdoms periods, and glass-related relics and workshops discovered in *Songguk-ri*, *Pyeongra-ri*, *Wanggun-ri*, and *Hwangnam* great Tomb suggest that Silla mass-produced glass beads within its own country. Java Jatim glass beads share a similar production method, but differ in artistry and sophistication. Korea is the region with the largest number of highly unique glass-bead artifacts in the world, showing that it occupied a leading position in production technique. Not only the symbolic system and expression style, but also the production technique and composite materials are consistent with the Central Asian or Xiongnu.

Third, certain beads distributed worldwide are closely connected to Silla's active maritime activities. Following Baekje, Silla took control of the southern sea route and actively engaged in trade activities centered around *Mingzhou*, *Guangzhou*, *Yangzhou*, and *Cheon-Ju* (*Quanzhou*). Arab records describe Silla as a utopia with plenty of gold and kings and a good place to live. *The Canon of Medicine* recorded Silla as being located at 170° east longitude and 5° north latitude, which shows that Silla's maritime trade base extended beyond the continent and reached deep into Southeast Asia. The compass comes from the '*Silla Chim Ban*', and Silla was so good

at navigation that it gifted magnets to the Tang Dynasty. Baekje ships and Silla ships were the best oceangoing ships at the time, and Silla ships traveled between Arabia and Japan, dominating the maritime network in the Indo-Pacific region.

Based on various evidences such as the Arabic map showing that Silla was composed of six large islands, the latitude, special products from subtropical regions, and the similarity between Tamil and Korean, it has been confirmed that Silla was based not only on the Korean Peninsula but also in the southeastern part of the continent and Southeast Asia. As the Southeast Asian region was an intermediate production site on the Maritime Silk Road and had abundant resources and labor, Baekje and Silla were able to become wealthy by utilizing these resources, so the existing import theory that the human-face inlaid glass bead was made in Rome or Java loses its persuasiveness. In addition, the similar beads excavated from Japanese Tombs and the name of the Japanese glass manufacturing office, *Japgong-Ho*, suggest that Silla spread glass technology to neighboring countries. It shows that Silla's maritime network was extensive and strategic, and the fact that the human-face inlaid glass bead manufacturing technique remains in Java can be said to prove the trade leadership of the Silla people who wore topknots and gold crowns.

In the end, the human-face inlaid glass bead is decisive evidence of the level of ancient Korean civilization in terms of the northern sky-believing identity, precise technology, and actual traces of maritime exchange. This artifact proves that Silla had trading bases in Southeast Asia and practically controlled the maritime Silk Road by traveling between Japan, Tang, and Arabia. This study sheds new light on the creativity of the ancient Korean people and the ancient Korean Wave '*Hallyu*.' Through analysis of the background and design symbolism of the traditional use of glass beads, the possession of related metal inlay technology, and the superiority of maritime technology, it was revealed that ancient Korea played a role in the cultural development and exchange between ancient Central Asia and Southeast Asia, and that it is important to understand it from a more balanced and comprehensive perspective.

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