

The Origin and Development of Ceramics with Underglaze Iron Decoration and White Porcelain in the Goryeo Dynasty

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I. Introduction

The use of underglaze iron decoration on Korean ceramics, which can be traced from the Goryeo dynasty to the present, is characterized by patterns painted using iron-oxide pigment.¹ The kilns making celadon-glazed stoneware in the southern part of the peninsula around Sanih-myeon (山二面) in Haenam (海南), Jeollanam-do province, were the main production sites. The origin of this method is understood to have connections with kilns in China, including Xicun-yao (西村窯) in Guangzhou (廣州) city,² Cizhou-yao (磁州窯) and Ding-yao (定窯) in Hebei (河北) province, and Yaozhou-yao (耀州窯) in Shaanxi (陝西) province. While scholars disagree on the exact history of the iron underglaze method, they trace its beginnings to the tenth or eleventh century.

As more kiln sites are excavated, however, we now know that the kiln sites producing underglaze iron ceramics were scattered widely, ranging from the west-central region to Gangwon-do province. The early period and the development process can be inferred through excavation work. It is now known, as well, that white porcelain was produced alongside celadon in the early phase, and production began with special vessels such as bottles, jars, and drum bodies (*janggo* 長鼓) but gradually extended to everyday vessels.³ Through research on tombs and habitation sites in various

places, moreover, we can postulate connections between underglaze iron ceramics and other ceramics,⁴ including when they were made and used.

This paper, based on existing research about patterns and shapes of vessels, focuses on examining the characteristics of production of underglaze iron ceramics. The origin and the development of underglaze iron ceramics is interpreted in a new way, and a preliminary attempt is made to determine its chronology.

Existing research on underglaze iron ceramics in the Goryeo Dynasty

Although many scholars have been interested in underglaze-iron painted ceramics,⁵ they have held different opinions about their origins and chronology. Gao Yuxie (高裕燮) asserted the possibility that iron decoration applied beneath celadon glaze was related to technology used in the kilns in northern China.⁶ Nomori Ken (野守健) divided the developmental process of ceramics in the Goryeo dynasty into four stages, and he noted that materials and techniques such as underglaze iron painted decoration (鐵畫), underglaze iron coating (鐵彩), copper-red glaze (辰砂), and black glaze (黑釉) were used in inlaid celadon ware (*sanggam cheongja*) in its prime. He classified both celadon with underglaze iron decor and celadon with underglaze white decoration (白畫青瓷) as “painted Goryeo (K. *heogoryeo*; J. *egorai* 繪高麗)” and proposed that, under the influence of Cizhou-yao, the underglaze iron technique began in Korea during the reign of King Sukjong (肅宗, r. 1095–1105) and developed in the late thirteenth and early fourteenth centuries.⁷

Hasebe Gakuji (長谷部樂爾) regarded celadon with underglaze iron decoration as unique among ceramics in the Goryeo dynasty. He considered that it inherited the technique of celadon ware made in Yuezhou-yao (越州窯), was influenced by Xicun-yao in the Northern Song dynasty, and became popular in the Goryeo dynasty from the end of the eleventh to the beginning of the twelfth century. According to him, Goryeo celadon with underglaze iron décor is divided into four types: Type A belongs to the early period, ranging from the end of the eleventh to the early twelfth century; Type B corresponds to the height of celadon’s popularity, throughout the twelfth century; Type C, from the

end of the twelfth century to the early thirteenth century, is characterized by liberal patterns of underglaze iron; and Type D, from the final period, was produced after the thirteenth century.⁸

Choe Sun-u (崔淳雨) insisted that the vessels with detailed underglaze iron designs and good glaze color, the result of firing in reduction, were influenced by Chinese ceramics of the Song dynasty.⁹ Nishida Hiroko (西田宏子) points out the difference in shape between Goryeo ware and Chinese Xicun-yao, while noting that the glaze color of underglaze iron celadon is different from that of other celadon and that the shapes of vessels are Chinese in style.¹⁰ Considering that underglaze iron celadon was produced for export at kilns in the southern coastal region of China during the eleventh and twelfth centuries, she finds the Goryeo version of the ware to belong to the later period. She argues that the early type with fine patterns was strongly affected by the designs of Cizhou-yao and was gradually transformed into the style of Goryeo.

Chung Yangmo (鄭良謨) has said that underglaze iron patterns began on Korean ceramics around the tenth century, and that celadon with underglaze iron vinescrolls or flower patterns was produced during the late eleventh and early twelfth centuries, under the influence of Yaozhou-yao and Cizhou-yao in northern China and Changsha-yao (長沙窯) and Xicun-yao in southern China.¹¹ He asserts that the vessels filled with designs and separated into upper and lower registers have connections with Cizhou-yao, and that those with major painterly motifs that lack subordinate design motifs are the style of Goryeo.¹²

Gang Gyeong-suk (姜敬淑) has said that kingfisher-colored celadon (*biasaek cheongja*) became sophisticated under the reign of King Injong (仁宗, r. 1122–46) in the first half of the twelfth century and that inlaid celadon began in the reign of King Uijong (毅宗, r. 1146–70). She considers that mold-impressed relief decoration and underglaze iron techniques were introduced during the same period.¹³

Recognizing a process of transformation of celadon ware with underglaze iron decoration during the Goryeo period despite Chinese influence, Itō Ikutarō (伊藤郁太郎) suggested the possibility of a different system of production from those of Gangjin and Buan. Although he agreed with Hasebe's

suggestion of a greater connection with southern China, he asserted that the order of B and C in the developmental process established by Hasebe should be reversed.¹⁴

Considering that celadon wares with underglaze iron décor and with white painted decoration developed in Haenam around the eleventh century, Jo Gi-jeong (曹基正) asserts that the techniques became less common as high-quality inlaid celadon was developed subsequently in Gangjin and Buan, but were the origin of black-and-white design techniques that reemerged in the same area in the twelfth and thirteenth centuries.¹⁵

Understanding rough-textured celadon, such as the products of Gyeongseo-dong in Incheon and Jinsan-ri in Haenam, to be a local style of the eleventh century, Yun Yong-i (尹龍二) illustrates various aspects of celadon production and use.¹⁶ According to him, underglaze iron celadon was produced in the late eleventh century, and was affected by the Chinese techniques of Xicun-yao and Cizhou-yao.¹⁷

Choe Geon (崔健) assumes that the twelfth century was a dark age of celadon production, during which Gangjin and Buan were the centers of the production and other kiln sites became extinct,¹⁸ and he asserts that the underglaze iron technique was also developed in the major production centers. In the development process of celadon's characteristic fine patterns, however, the underglaze iron technique with relatively easy and rough expression was marginalized and treated as less desirable. During the decline, the kilns making underglaze iron celadon, including the kilns of Jinsan-ri (珍山里), deteriorated without improvements to their shape and production structure.¹⁹

This review of scholarly opinion suggests a general agreement on the date for development of the underglaze iron technique, centering in the later eleventh and twelfth centuries, and on its status within the ceramic craft. Nevertheless, there are differences in understanding of the order of stylistic development and the lineage of design techniques. Opinions have differed regarding the origins of the underglaze iron technique, exploring aspects such as the latency of Yuezhou-yao technique and the introduction of Cizhou-yao and Xicun-yao techniques. The use and status of this technique will be discussed first by examining underglaze iron ceramics in various archaeological sites.

Underglaze iron ceramics found in excavated sites

Underglaze iron ceramics buried in tombs

1) Tomb Seok-reung (碩陵) of King Huijong (熙宗, r. 1204–11): No ceramics with underglaze iron decoration have been found here, but a dish and a cylindrical cup with flower patterns characterized by white-painted dots and underglaze iron painted dots have been found. (Fig. 1) Considering that the tomb was constructed around 1237, this kind of celadon, with black and white dots, was the product of the first half of the thirteenth century.²⁰

2) Tomb in Samhwa-dong (三和洞), Donghae-si (東海市), Gangwon-do province: Artifacts excavated from the tomb include celadon, such as a bowl with molded relief decoration, a ewer, a vessel for decanting wine, three bowls, three cups, an incense burner and so on, and white porcelain, such as a underglaze iron painted bottle (*maebyeong*) with vinescroll pattern, a spoon, a bottle (*jeongbyeong*), and an underglaze iron painted jar with vinescroll pattern. All the vessels with underglaze iron patterns are white porcelain, and they are assumed to be local products, considering their coarse quality as compared to the celadon. They are presumed to be products of the mid-twelfth century.²¹

3) Tombs in Jik-dong (直洞), Chungju (忠州), Chungcheongbuk-do province: In the tomb with a stone chamber, number A-7, an underglaze iron patterned bottle was excavated together with Chinese coinage marked Yuanfeng tongbao (元豐通寶, 1078–85). The shape and the patterns of the bottle are similar to one found in the tomb in Samhwa-dong, Donghae-si, and its glaze color is yellow-toned. The tomb is dated after 1078.²²

4) Tomb in Gyeongsan (慶山), Imdang (林堂), Gangwon-do province: In earthen tomb number 48 in area A-1, an underglaze iron patterned celadon bottle was excavated among dishes. In earthen tomb number 117, also in the A-1 area, a bottle with an underglaze iron pattern was found. The celadon is assumed to be a local product because of its rough quality.²³

5) Tombs in Danwol-dong (丹月洞), Chungju, Chungcheongbuk-do province: In the tomb with a stone chamber, number B-3, an underglaze iron celadon bottle was excavated with a bronze spoon, an ornamental hairpin, and ceramic pieces, among other items. The bottle is decorated from the

shoulder to the mid body with an underglaze iron painted vinescroll pattern.²⁴ In addition, in the tombs of Danwol-dong, an underglaze iron bottle (*maebyeong*) and a vase with long neck and wide mouth were excavated, among other items. (Fig. 2)

6) Ruins in Yongam (龍岩), Cheongju (淸州), Chungcheongbuk-do province: Dozens of tombs contain celadon, and the celadon was usually buried with other ceramic and metal wares. An underglaze iron patterned vase with a long neck and wide mouth was excavated from tomb number 107.²⁵

7) Tombs in Geumhak-dong (金鶴洞), Gongju (公州), Chungcheongnam-do province: Celadon, bronze mirrors, and coinage were buried together. In tomb number 8, a soup bowl with incised lotus pattern, a dish with angular hip (折腰), and an underglaze iron pattern bottle were buried with Chinese coinage marked Chongning tongbao (崇寧通寶, 1102–06). They are believed to have been buried after the first half of the twelfth century.²⁶ (Fig. 3)

8) Tombs in Habangchon (下方村), Jangheung (長興), Jeollanam-do province: Twelve tombs in the area have been investigated. Since celadon found in the area belongs mostly to the type *ga* of number 10-2 in Yongun-ri, Gangjin, a vase found in the area with a long neck and wide mouth, probably the product of Haenam, can be dated by the type. (Fig. 4)

The most common shapes of underglaze iron painted vessels found in tombs are jars, vases with a long neck and wide mouth, and bottles, and they are excavated primarily from ruins dating after the twelfth century. Generally, they were buried with bowls and dishes for dining and were not as high in quality as accompanying celadon and white porcelain. Underglaze iron painted ceramics from tombs are often found buried with metal vessels and higher quality ceramics for a rich variety of grave goods.

Underglaze iron painted ceramics excavated from habitation sites

1) Ruins in Dae-ri (大里), Jangheung, Jeollanam-do province: High quality kingfisher-colored celadon from Gangjin and pieces of underglaze iron painted drum bodies from Haenam were excavated.²⁷

2) Ceremonial ritual ruins in Mt. Wolchulsan (月出山), Jeollanam-do province: Presumably the ruins related to the temple of Wolsaengsansinsa (月生山神寺), which was recorded in *The History of Goryeo* (高麗史). The ritual ceremony on Cheonhwangbong peak was regarded as a national ceremony, and underglaze iron painted bottles and lidded bowls made of highest quality celadon have been excavated.²⁸

3) Temple site of Mireuksa, Iksan, Jeollabuk-do province: In the Goryeo dynasty layer of celadon were found varieties of vessels decorated with various techniques, including inlay, white painting, and underglaze iron painting. They included a bowl with a halo-shaped foot, a soup bowl, and a cup. Among 11,076 pieces of Goryeo ceramics excavated here, there are 7,475 pieces with no design (67%), 1,016 incised pieces (9.2%), 1,894 pieces with relief decoration (17%), 189 pieces of white painted ware (1.7%), 491 pieces of inlay (4.4%), and 11 pieces of underglaze iron painted ware (0.09%).²⁹ The number of underglaze iron painted pieces is less than the number of white painted pieces, which is a common phenomenon in kilns of the later twelfth and the thirteenth centuries.³⁰

4) Temple site of Geodonsa (居頓寺址), Wonju (原州), Gangwon-do province: A celadon bowl with a relief vinescroll pattern on the inside and a rounded cup with a lotus design incised on the outside were excavated. They were accompanied by a dish with molded relief decoration and angular hip, a small dish, and a celadon lid with underglaze iron pattern.³¹ (Fig. 5) The celadon lid corresponds to a common phenomenon at the time, represented by the use of high quality of kingfisher-colored celadon lids on underglaze iron pattern vessels that were excavated in Gangjin.

Underglaze iron painted ceramics salvaged from the sea

In 1983 and 1984, a wooden ship of the Goryeo dynasty was salvaged off Eodu-ri, Wando-gun, Jeollanam-do province; 30,646 pieces of celadon were found in the ship, including yellowish brown rough celadon without decoration and blackish brown ceramics such as underglaze iron painted celadon. Among them were fifteen pieces of underglaze iron painted bottles (*maebyeong*) (Fig. 6) and drum bodies (Fig. 7). All the celadon salvaged off Eodu-ri is thought to have been produced at the same site and during the same period. Among the total relics, there were 19,256 fragments of soup bowls

(60%), 1,096 of bowls (3.6%), 9,879 of dishes (32.6%), and 103 of vases with long necks and wide mouths (0.3%).³² Of all the vessels, the bowls were of the highest quality. All of the vessels are similar in shape and quality to the products of the kiln at Jinsan-ri in Haenam, and it is presumed that they were produced in Haenam.

Underglaze iron painted ceramics found in kiln site excavations

1) Kiln site in Bangsan-dong (芳山洞), Siheung (始興), Gyeonggi-do province: In the third period layer, three fragments of underglaze iron painted drums were found. They were shaped with white clay with a glaze of bright whitish-yellow color, but the condition, without gloss, is not good. Their design motif is a vinescroll pattern, applied liberally. (Fig. 8) The third period is the last layer in Bangsan-dong and corresponds with the end of the tenth century.³³

2) Kiln site in Jungdeok (中德), Seo-ri (西里), Yongin (龍仁), Gyeonggi-do province: In the first and second excavations, underglaze iron painted fragments were found. In the first excavation, about twenty underglaze iron painted fragments were collected. The fragments are of sandy clay and are reddish brown after firing. Considering the shape, they are likely from a drum body. These fragments are unglazed inside, and the outside glaze has a blue tint with some light brown parts. The underglaze iron painted design patterns are blackish brown, and with the exception of one fragment they are painted liberally using a “boneless” (*mogu*, 沒骨) non-outline method. The report on the excavation asserts that the underglaze iron painted fragments were accompanied by type 2 *ga* white porcelain, which is coarser than type 1, and by a bowl with a halo-shaped foot.³⁴

In the second and third excavations, twenty-three pieces were found, among which are an underglaze iron painted drum body and squared special fragments. (Fig. 9) They show various aspects of the early celadon kiln sites. The underglaze iron painted technique is only found on white porcelain and mostly in the third period layer.³⁵ The layer is the type 10-1, compared to the number 10 kiln site in Yongun-ri, Gangjin, and the layer accompanying the degenerative halo-shaped foot, in which bowls with halo-shaped feet become smaller and the foot diameter becomes narrower.³⁶

3) Kiln site in Sangban (上盤), Seo-ri, Yongin, Gyeonggi-do province: This site was excavated

three times. Underglaze iron painted white porcelain fragments were excavated along with a Korean-style bowl, which has a halo-shaped foot with a ground plane about 1 cm wide. In both swollen ends of a drum body, a peony motif was boldly painted with the underglaze iron painting technique; in the middle portion, leaves and dots were painted inside a line. Some fragments are glazed on the inside, but others are not.³⁷ (Fig. 10) Since the area is undergoing its third excavation, changes may occur.

4) Kiln site in Changpyeong-ri (昌平里), Chilgok (漆谷), Gyeongsangbuk-do province: This site is not a formal excavation, but it is known through excavating a brick kiln in Jinin-dong, Daegu. This kiln is built of clay, but a strong influence of brick kiln practice is found in the kiln tools. Underglaze iron painted fragments are found in this site.³⁸ Searching the site grounds reveals additional underglaze iron painted fragments.³⁹ (Fig. 11)

5) Kiln site number 10 in Yongun-ri (龍雲里), Gangjin (康津), Jeollanam-do province: The H-type bottle with an underglaze iron pattern, belonging to the type *ga* of the number 10-2 in Yongun-ri, is the earliest example in the layer.⁴⁰ The bottle has a swollen shoulder, a slender lower body, and a high attached foot, looking like a skirt. The fine, high-quality clay is glazed in kingfisher-color. The central body has an underglaze iron painted peony with broken branches, and underglaze iron painted leaves adorn the two shoulder parts. (Fig. 12) In the case of the type *na* of the number 10-2 in Yongun-ri, the underglaze iron painting technique is only used in dishes.

6) Kiln sites in the Gangjin area identified by ground survey: The examples of underglaze iron celadon excavated in the area are as follows: in addition to the number 10 kiln site, underglaze iron painted fragments were found in kiln sites number 1, 7, 14, 15, 50, 73, and 74 in Yongun-ri. Underglaze iron painted fragments were also found in kiln sites number 19, 25, 36, 39, 42, and 49 in Gyeyu-ri, and in kiln sites number 7, 18, and 41 in Sadang-ri.⁴¹ Since these results are from a ground survey, results may differ after excavation.

7) Kiln site number 17 in Jinsan-ri, Haenam, Jeollanam-do province: In this site, a total of 760 fragments was found, most of them so-called green celadon (*nok cheongja*), which is a relatively rough quality of celadon. Among them, the underglaze iron painting technique is found on a bottle presumed to be a *maebyeong* (Fig. 13), a glazed bottle, a jar, a basin, a bowl with a lid, and a drum body, which

show the wide variety of production at the Korean kilns. Ceramics excavated in the lower layers are of relatively good quality, and they become coarser through the higher layers. Underglaze iron and white painted patterns in the lower layers are fine and voluminous and have strong shading. The patterns on wares in the upper layers are not fine and change to become lines.⁴² Accompanying relics have a similar combination as the type *ga* of the number 10 kiln site in Yongun-ri, Gangjin.

8) Kiln sites in the Haenam area identified by ground survey: Among roughly eighty kiln sites excavated in Jinsan-ri, underglaze iron decoration is found at about forty sites, including kiln sites 1–9, 20, 25–27, 30–40, 49, 51–55, 65–66, 69–72, and 77–78 in Jinsan-ri. In those sites, underglaze iron painted ceramic fragments, such as an underglaze iron patterned drum body, are found. Most of the sites also include so-called green celadon (*nok cheongja*), and some of them include celadon bowls with a halo-shaped foot. Both underglaze iron and white painted techniques are used together, even in the same vessel.⁴³ There is evidence of experimentation with techniques such as black inlay (黑象嵌), white coloring (白彩), and excised background (剝地).⁴⁴

9) Kiln site number 18 in Jinseo-ri, Buan (扶安), Jeollabuk-do province: Underglaze iron patterns are found on dishes of the F type (the R type in Yongun-ri), and the H type (the U type in Yongun-ri).⁴⁵

10) Kiln site number 20 in Jinseo-ri, Buan, Jeollabuk-do province: Inside a small dish, patterns of + shape in underglaze iron are found.⁴⁶ This pattern was also tried on the type T dish in layer 10-2 of Yongun-ri, Gangjin.

11) The kiln site number 7 area in Yucheon-ri, Buan, Jeollabuk-do province (Yucheon-ri sites number 27 and 28): Since underglaze iron painted patterns and white painted patterns are used together on pieces from this site and have a similar pattern style, the excavator treats them together. Of the excavated celadon, 27 percent has patterns, and about 10 percent of the patterned celadon is underglaze iron and white painted.⁴⁷ The percentage of underglaze iron pieces and white painted ones is relatively low, compared to the fact that underglaze iron and white painted ceramics constitute 16.6 percent of layer 10-2 of Yongun-ri. Compared to the use of these two techniques only in dishes in layer

10 of Yongun-ri, Gangjin, the techniques appear here even in rounded and top-shaped cups.

12) Kiln sites in the Buan area identified by ground survey: Aside from the area in Buan previously mentioned, dishes and bowls with underglaze iron and white dotted designs are found in kiln sites such as number 2–15 in Yucheon-ri, the number 7 newly excavated site in Yucheon-ri, and numbers 1–1 and 1–2 in Jinseo-ri.⁴⁸

13) Kiln site in Saeng-ri (筮里), Eumseong (陰城), Chungcheongbuk-do province: Seven fragments of a celadon drum body with underglaze iron and white painted vinescroll patterns are found. The inside surfaces were not glazed, and the outside surfaces were painted in vinescroll patterns after being divided vertically by a line. Among the seven pieces, three have white dots in the same interval within the vertical lines. They are high quality, using fine gray clay and celadon glaze with a tint of transparent rust brown and bluish green.⁴⁹ Compared to the patterns of drum bodies in Jinsan-ri, Haenam, which have white dots between the lines, these are a little different, with a finer, more solid quality. (Fig. 14)

14) Kiln site in Songgye-ri (松溪里), Jecheon (堤川), Chungcheongbuk-do province: This site is well known as the temple site of Sajabinsinsa (獅子嘸呻寺). Underglaze iron patterned fragments are found, together with a dish with an incised parrot motif and a soup bowl with an incised lotus pattern on the outside. That the kiln was operated before 1022 is suggested by the accumulation of kiln debris concentrated within 15m around the layer of a tower in the temple, which was built in 1022.⁵⁰ However, the area around the tower was formed as a monumental site, and the wastes were scattered to the south near the tower, west of arable land and north of an embankment. In my opinion, therefore, it is reasonable to consider that the kiln site was formed after 1022, after the temple was built, used, and deserted. I also found underglaze iron painted fragments, which are presumed to be a part of soup bowls, dishes, bottles, and drum body. The fragments have qualities similar to white porcelain in the early kiln sites of the west-central area, rather than celadon. (Fig. 15) They belong to the type *ga* of the number 10-2 in Yongun-ri, Gangjin, as indicated by the thin, elongated white supports for firing and the vessel shape.

15) Kiln site in Sagijeomgok (沙器店谷) Gangleung (江陵), Gangwon-do province: This site is

not officially researched, but two fragments of underglaze iron painted celadon were found recently.⁵¹ One is presumed to be part of a bottle with a blackish brown grass pattern, and the other is probably a dish with lines and dots. Since other ceramics show incised, impressed relief, and inlay techniques, which are typical of the middle Goryeo dynasty,⁵² the underglaze iron painted fragments are probably from the same period.

16) Kiln site number 10 in Sangmuyong-ri (上舞龍里), Bangsan (方山), Yanggu (楊口), Gangwon-do province: In the ground survey, a melon-shaped fragment of underglaze iron painted white porcelain was collected.⁵³ Vegetal design motifs were painted with underglaze iron. The fragment is made of light gray clay, and its wall is thin despite impurities and pores. (Fig. 16) The pale green color of the glaze has changed a bit to yellowish brown. Since the quality of the white porcelain fragment is similar to the quality of white porcelain of the late Goryeo dynasty found in the area of Bangsan, Yanggu, this shows the possibility that white porcelain was produced in the area before the end of the Goryeo dynasty.

According to information presented here, the underglaze iron painting technique began at the brick kilns that produced early celadon in the west-central area. Beginning with the kiln in Bangsandong, Siheung, the underglaze iron painted technique was used at brick kilns in the next period, in Seori, Yongin and Chilgok, Gyeongbuk. However, Haenam was the place that used the underglaze iron painted technique most actively. Through the influence of Haenam, the technique was used in Gangjin at the end of the eleventh century. Production of underglaze iron painted ceramics in Haenam decreased, and underglaze iron and white painted dots and line motifs became more common in Gangjin and Buan.

Although underglaze iron painted ceramics account for a small portion of excavated articles,⁵⁴ it is known that underglaze iron painted celadon was also produced in Hwaje-ri (花濟里), Yangsan-gun (梁山郡); Deokpo-dong (德浦洞), Buk-gu (北區), Oncheon-dong (溫泉洞), Dongrae-gu (東萊區), and Busan-si (釜山市), all in Gyeongsangnam-do province, in addition to the kilns previously mentioned.⁵⁵ Since celadon was produced nationwide after the early period, local kilns producing underglaze iron painted ceramics must have been more common than previously assumed.

Characteristics of underglaze iron painted ceramics excavated from kilns

The vessel shapes bearing underglaze iron painted decoration from the kilns just mentioned include drum bodies, vases with long necks and wide mouths, bottles, lidded bowls, dishes, and pillows. The most common design motifs are flowers with broken branches, lotuses, lines, and dots.

Vessel shapes and design motifs

1) Drum: As a kind of musical instrument, it is usually made of white porcelain or celadon and is decorated with underglaze iron painting (鐵畫) and patterns of underglaze iron decoration (鐵彩). Sometimes it is partially decorated with white patterns.⁵⁶ The inside is generally not glazed. Patterns are painted on both swollen ends of the instrument, but there are some examples of close patterns decorating the middle section. Although there are differences in composition and pattern, the band of design motif is generally divided horizontally. Found in the brick kilns in Bangsan-dong of Siheung, Seori of Yongin, and Changpyeong-ri of Chilgok, the ceramic instrument was produced in the last stage of production of bowls with the Korean style halo-shaped foot, except for Bangsan-dong and Saeng-ri of Eumseong.

2) Vase with a long neck and wide mouth: Found in the clay-built kilns of the southern area, this is a representative vessel shape found in layers 9 and 10-1 of Yongun-ri. This vase form is understood to have succeeded the hard earthenware (硬質陶器) and metal vessels of the United Silla period, and the form is considered to illustrate the improvement in quality from earthenware to ceramics with the appearance of celadon glaze.⁵⁷ However, the vase produced in Gangjin and Jinsan-ri of Haenam should be understood in relationship to contemporaneous earthenware in the Goryeo dynasty. Excavators of kiln number 9 of Yongun-ri found a large number of earthenware vessels similar in shape to celadon in the vicinity. The excavation of Samheung-ri also confirmed that earthenware and ceramic kilns were managed in the same site at the same time.⁵⁸ Nevertheless, since there is no example in Gangjin at the same period, the Jinsan-ri kiln of Haenam is considered the center for the use of the underglaze iron painting technique on bottles and vases with long necks and wide mouths.

Generally, motifs of flowers with broken branches are painted on both sides of the central body and shoulder. The vase with underglaze iron patterns is presumed to be the product of the first half of the twelfth century because such a vase has been excavated from the tombs of Habang-chon, Jangheung, Jeollanam-do province, with celadon of the type 10–2 *ga* in Gangjin, Yongun-ri, which was presumably produced in Haenam.

3) Bottles (*maebyeong*): It is also assumed that the Haenam area is the center for bottles. In kiln number 17 of Jinsan-ri, a bottle with an underglaze iron painted lotus pattern band on the lower body was excavated, and eleven bottle pieces presumably produced in Haenam were found among relics from the sea in Wando. Some bottles have underglaze iron painted patterns of flowers with broken branch motifs on both sides of the swollen body, and others have underglaze iron painted lotus pattern bands on the upper and lower parts. There were two techniques for the lotus pattern bands: painting with a brush, and incising the outlines of leaves after applying iron pigment (鐵彩). Since the two techniques were used together from time to time, it is considered that they are both from the same time period. (Fig. 17)

4) Bowls and cups: Although bowls and cups with underglaze iron patterns are rare, some are found in Gangjin and Buan. Most bear underglaze iron patterns beneath high quality kingfisher-colored celadon. In kilns number 15 of Yongun-ri and number 18 of Sadang-ri, underglaze iron patterns are painted on the outside of bowls, and leaf patterns are painted on the outside of a cup in kiln number 74 of Yongun-ri. They all belong to the type 3 of Gangjin.

5) Dishes: Almost no examples of dishes are found in the early kilns of the central area and Jinsan-ri, Haenam; most examples were produced in the kilns of Gangjin and of Jinseo-ri and Yucheon-ri, Buan. In layer 10–2 of Yongun-ri, the underglaze iron painting technique is used only in the type *na* dishes. They account for 12.3 percent of dishes with patterns, and the underglaze iron patterns of lines or flowers occur on the edges or inside the dishes. Apart from dishes, underglaze iron patterns appear on various bottle forms, bowls with lids, pillows, and basins.

In sum, patterns painted using underglaze iron appear mainly on special vessels such as drum bodies and pillows in the early period. The underglaze iron patterns on vessels for everyday life, such as

bottles and vases with long necks and wide mouths, were developed in Haenam. In Gangjin at the same period, incised and high relief techniques were used on bottles, vases with long necks and wide mouths, and drum bodies, but there is almost no example of the underglaze iron painting technique. Among bottles, a new shape of opening, broken horizontally, appeared.

In terms of design motifs, while local examples have sparse patterns, such as grasses and flowers in simple compositions, products of Jinsan-ri, Haenam, have ornately painted patterns, which occupy the whole body. In Gangjin and Buan, we see underglaze iron patterns on small vessels such as bowls, cups, and dishes after the middle of the Goryeo dynasty, and the patterns are especially evident on dishes. Nevertheless, with the passage of time, underglaze iron patterns become less common, though underglaze iron and white painted dots and lines increased in number.

Relationship to the black flower (黑花) technique in China

In China, the use of underglaze iron pigment on ceramics appeared quite early. In the Western Jin dynasty (265–317), brown colored dot patterns were found on wares made in Zhejiang province, and brown design motifs were produced at Changsha-yao in Hunan province.⁵⁹

It is known, however, that the “black flower” technique originally developed at kilns in the north.⁶⁰ From the end of Five Dynasties to the early Song Dynasty, in the tenth century, painting using black pigment on a white background appeared at Yaozhou-yao, Shaanxi province; Cizhou-yao, Hebei province; Xiuwu Dangyanggu-yao (修武當陽谷窯) and Hebiji-yao (鶴壁集窯), Henan province; Bacun-yao (扒村窯) in Yuxian (禹縣), Quhe-yao (曲河窯) in Dengfeng (登封), and Jiexiu-yao (介休窯), Shanxi province; and Jizhou-yao (吉州窯), Jiangxi province.⁶¹ At Cizhou-yao especially, the method of applying white slip over the raw clay body was devised because of the poor quality of local clay. The innovative methods of Cizhou-yao had a great influence on all northern and southern areas from the Five Dynasties to the Yuan dynasty, and many kiln sites produced vessels with black-painted decoration on a white ground. Kilns that imitated Cizhou-yao can be found in Shanxi, Shandong, Sichuan,⁶² Hunan, Anhui, Jiangxi, Guangdong, Guangxi Zhuangzu Zizhiqu, and Fujian provinces.⁶³

Painting black designs on celadon-glazed vessels without the use of white slip appeared

notably at Xicun-yao⁶⁴ (Fig. 18) and Chaozhou-yao⁶⁵ (潮州窯) in Guangdong province and Dehua-yao⁶⁶ (德化窯) and Cizao-yao⁶⁷ (磁竈窯) in Fujian province. The same decorative technique was also used at kilns in the Liao (遼) territory, such as Nei Menggu Zizhiqu (內蒙古自治區) and Ningxia Huizu Zizhiqu (寧夏回族自治區), which were under the influence of Cizhou-yao.⁶⁸ We can assume a major influence of “black flower” painted decoration, since an underglaze iron painted drum body (Fig. 19) was excavated in the later layer of the kiln in Silongkou (寺龍口), Cixishi (慈溪市), Zhejiang province, which was affiliated with Yuezhou-yao.⁶⁹

Accordingly it is assumed that this technique was introduced to Korea, but there are differences in specific design techniques. In the Cizhou-yao-affiliated wares, a coating of white slip was the ground for techniques including underglaze iron decoration (鐵彩), incising through a coating of iron applied over the slip (鐵彩), and carving away the background (剝地). Among Korean products, a fragment of a drum body bearing Chinese style design motifs, inlaid in white after applying red clay on white porcelain, was excavated in the kiln of Jungdeok, Seo-ri, Yongin.

Motifs appearing at the kilns of Jinsan-ri, Haenam, in which the background was cut away through a layer of iron-bearing slip applied over white slip, are considered to reflect a northern Chinese technique. Frequent use of peony design motifs and the arrangement of lotus design bands on the upper and lower parts of vessels also must have been related to Chinese style.

Except for these examples, however, for the most part in Korea the underglaze iron painting technique was used directly on the clay beneath celadon glaze. Therefore, it is also suggested that the origin of the technique was related to Xicun-yao and Chaozhou-yao in southern China.⁷⁰ Since there are examples of Xicun-yao basins painting liberally in an underglaze iron pattern under a glaze with a yellowish brown tint, the relationship to Chinese kilns should be researched further.

In terms of the relationship with Chinese kilns, the shape of the mouth rim of bottles is also noteworthy. Although a wide opening is common on Korean bottles with underglaze iron painting, there is a rare opening shape that is raised slightly above the shoulder and widens horizontally. Most bottles with the horizontal opening have lotus design bands on the shoulder and foot, with chrysanthemum

and vinescroll patterns on the whole body. (Fig. 20) This format is known in Cizhou-yao bottles after the eleventh and twelfth centuries, and it appears on bottles with a slightly different shape in cobalt-decorated porcelain of Jingdezhen (景德鎮) in the fourteenth century. The straight profile from the shoulder to the foot of such bottles can be considered a characteristic of Chinese bottles in the fourteenth century. Therefore, such bottles presumably were produced in Korea after the twelfth century.⁷¹

Examining Korean underglaze iron painted ceramics in relation to China, Chinese bottles with horizontal openings and a fine technique of black painting, produced in the Cizhou-yao-affiliated kilns of northern China, appear in some areas. Regarding the relationship with southern China, there are similarities to basins made at kilns in Guangdong and Fujian provinces, and in the technique of liberally painting design motifs without using an undercoating of white slip to conceal the clay body. In addition, there are similarities in the relatively rough quality of yellowish brown celadon glaze and in the firing method of stacking vessels in the kiln. In my opinion, therefore, although there was direct influence of the Cizhou-yao-affiliated kilns of northern China, Korean underglaze iron painted ceramics were produced in a method close to that found in southern China. Evidence is not sufficient to explain the relationship with China because only one kiln in Haenam that produced underglaze iron painted ceramics has been excavated. At present, it is assumed that Korean underglaze iron painted ceramics were adapted considerably to the Korean conditions of production.

Production type and period of underglaze iron painted ceramics

Although underglaze iron painted ceramics produced in various kilns do not constitute a large quantity, through examining excavated and researched kilns their production types and periods may be said to be as follows:

An underglaze iron painted drum body, excavated in the uppermost layer of the third stage in Bangsan-dong, Siheung, belongs to the stage before the third stage layer of Seo-ri, Yongin, considered to date to the end of the tenth and the early eleventh centuries.⁷²

In the case of Jungdeok, Seo-ri, Yongin, underglaze iron painted ceramics account for 0.2

percent of the whole quantity by three studies. Among the twenty articles in the second and the third excavations, five fragments of drum body were found in the second stage layer, and eighteen pieces were in the third stage layer. Therefore, drum bodies were produced mainly in the period of the third stage, and over 75 percent of the whole quantity was produced in the same period, according to excavation reports.⁷³ In addition to use on drum bodies, underglaze iron patterns appear on special vessels such as pillows, showing that such patterns were more common on special vessels. The kilns of Seo-ri were most active during this period, producing bowls with the Korean-style halo-shaped foot as well as white porcelain, which was made mainly in the Jungdeok kiln. Compared with Siheung, it is the next period of the last stage in Bangsan-dong. However, the Jungdeok kiln had its heyday in the early and middle eleventh century, since the layer of the third stage had a broad range and underglaze iron painted fragments appeared in the later layer of the third stage.

Although the excavation of the area of Sangban, Seo-ri, Yongin is not finished, its starting period is not assumed to be as early as Seo-ri. Since the fragments of drum bodies with underglaze iron patterns are almost the same type as those of Seo-ri, and they accompany similar relics, the fragments are considered to be produced at the same or a slightly later period than Seo-ri.

The Chilgok kiln, Changpyeong-ri, is of a similar period as the stage producing underglaze iron patterns in Yongin, considering that it was a brick kiln and yields soup bowls with a curved inside surface (玉環底系) as well as fragments of underglaze iron painted drum bodies.

Underglaze iron patterns in the clay-built kilns of Jeollanam-do province are considered to be the earliest examples. In the case of Jinsan-ri, Haenam, bottles and vases with long necks and dish mouths are produced in relatively large numbers, and the area seemed to have a close relationship with the kilns of Gangjin. The products excavated in Jinsan-ri exhibit the Korean style halo-shaped foot, which is very rare in the layer of early periods. However, considering the shapes and design motifs of bottles and vases with long neck and wide mouths,⁷⁴ the ceramics in Jinsan-ri are closer to the period of the type *ga* of the 10–2 layer in Yongun-ri.

In the remains of the Korokan (鴻臚館) in Fukuoka prefecture, northern Kyushu, Japan, a Korean celadon bowl with a halo-shaped foot, found above the layer lost by a fire in 1048, presumably

dates to the middle of the eleventh century.⁷⁵ Among relics excavated in the area, dishes of the form U-1, belonging to the type *ga* of the 10–2 layer in Yongun-ri, Gangjin, were found together with Chinese celadon of Longquan-yao (龍泉窯) dating to the twelfth century, which allows an estimation of the production period.

In the case of kiln number 10 of Yongun-ri, Gangjin, painterly underglaze iron patterns appear in the type *ga* of layer 10–2. (Fig. 12) However, in the type *na* of the same layer, only dishes have underglaze iron patterns, and thirty-seven fragments of dishes have underglaze iron patterns, which accounts for 12.3 percent of all the dishes with patterns. Since the type *na* of layer 10–2 in Yongun-ri is located above the type *ga*, early underglaze iron patterns were painterly, but they became simple decorative patterns, such as dots and lines, as time went on. Along with kiln number 10 of Yongun-ri, the same phenomenon of white painted dot patterns appeared in the area of Buan.

A ground survey suggested similar circumstances in the 188 celadon kiln sites of Gangjin. Fragments with underglaze iron patterns were collected in seven other sites of Yongun-ri in addition to kiln number 10; in six sites of Gyeyul-ri; and in three sites of Sadang-ri. Underglaze iron patterns on a soup bowl, in the period of the type 2 in Gangjin, appeared only in kiln number 19 of Gyeyul-ri. The rest of the sites contained primarily products in the period of type 3. Therefore, according to the ground survey, Gangjin produced fewer underglaze iron painted ceramics than Haenam, and produced them primarily during the twelfth and the thirteenth centuries.

Since only one site in Jinsan-ri was officially excavated and relics from the later period were found by ground survey, future research should explore how long Gangjin and Haenam were producing simultaneously. Inscriptions on ceramics suggest that the latest period of underglaze iron painted ceramics would be the later Goryeo dynasty. On some underglaze iron painted celadon housed at the National Museum of Korea, inscriptions name the Sojeonsaek (燒錢色), an office in charge of national ritual ceremonies at the end of the thirteenth century.⁷⁶ There is also a vase with long neck and wide mouth with an inscribed date corresponding to 1342 (至正 2年).⁷⁷

The quality of underglaze iron painted ceramics can be determined by the method of stacking the kiln for firing. In Gangjin and Buan, silica spurs were used to support high quality celadon (type 4),

while a sand-molded spur was used for underglaze iron painted celadon. Therefore, it is rare to see underglaze iron patterns on high quality vessels, and it is understood that the quality, different from that of inlay and incised techniques, was already planned in the production stage. That is to say, various products of differing qualities were possible in the kilns of the southern area. Presumably the underglaze iron patterns were used primarily in Haenam and the incised technique was used primarily in Gangjin, though both areas produced the same types of vessels.

Conclusion

This paper has explored various aspects of underglaze iron painted ceramics, including the characteristics, production types, production history, and changing processes, through examining the kilns and the remains of habitation sites.

Among underglaze iron painted ceramics in tombs are many relatively special vessels such as jars, bottles, and vases with long necks and wide mouths. The underglaze iron painted ceramics accompany bowls and dishes, and the quality of the ceramics is lower than associated celadon and white porcelain. Therefore, it appears that underglaze iron painted ceramics were buried with earthenware, metal ware, and ceramics of high quality in order to provide a rich variety.

Although underglaze iron painted ceramics account for a small number of the articles excavated in kiln sites during the Goryeo dynasty, the ceramics were produced in kiln sites distributed nationwide. According to excavated examples, local kiln sites producing underglaze iron painted ceramics increased in number after the middle of the Goryeo dynasty.

Underglaze iron painting techniques began in the early brick kilns of the west-central region of Korea, and the technique was used first on white porcelain as the kilns were changed to producing white porcelain. Starting with Bangsan-dong, Siheung, in the area of Seo-ri, Yongin and Chilgok, and Gyeongbuk in the next period, brick kilns produced underglaze iron painted ceramics. However, the most active area was Haenam of Jeollanam-do province. Although the Gangjin area also produced underglaze iron painted ceramics at the end of the eleventh century, the production of such ceramics in the Haenam area increased after the late twelfth century.

In the early period, the underglaze iron painting technique was used primarily on special vessels such as drum bodies and pillows. In the Haenam area, the technique was used on vessels for ordinary living such as bottles and vases with long necks and wide mouths. Nevertheless, in the Gangjin area in the same period, there is almost no example of the underglaze iron painting technique.

In terms of design motifs, there are many examples from Jinsan-ri, Haenam of ample and liberally painted underglaze iron patterns, while examples from local kilns have simple and loose compositions of vegetal patterns. In Gangjin and Buan, underglaze iron patterns appeared on small vessels such as bowls, cups, and dishes, among which dishes especially used many patterns. As time went on, however, the patterns changed to dots and lines painted in underglaze iron and white, and the underglaze iron painted patterns decreased. Regarding vessel shape and pattern application technique, there may be connections with the kilns in northern and southern China.

Because the production of underglaze iron painted ceramics was centered in the southern area of the peninsula, there are virtually no known examples that suggest that underglaze iron painted ceramics accompanied celadon bowls with the halo-shaped foot that were produced in Gangjin. In kiln number 10 of Yongun-ri, underglaze iron painted ceramics appeared for the first time in the period of the second layer. Therefore, active production of underglaze iron painted ceramics in the southern area is considered to run from the end of the eleventh and the early twelfth centuries. In particular, underglaze iron painted ceramics of Jinsan-ri, Haenam, can be understood to complement the high quality of celadon in Gangjin and the coarse quality of celadon in Haenam. Though production seems to have been managed by an official system, considering certain techniques and the scale of kilns in Haenam area, further research should attempt to determine whether it was managed systematically.

Certain important issues had to be omitted from this paper due to constraints of length. They include the detailed evolution of underglaze iron painting techniques; the technique's interrelationship with the inlay technique, which was an advanced form of decoration; and the interrelationship with white painting and underglaze iron decoration (鐵彩) techniques. My future research will address these topics.

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¹ The technique is also called “iron painting (cheolheo 鐵繪)” and “Goryeo painting (K. heogoryeo; J. e-gōrai 繪高麗)”, but it is customary to call it “underglaze iron painting (cheolhua 鐵畫).”

² Yun Yong-i, “Comprehensive examination about ceramics in the seabed of Wando.”

³ Mokpo University Museum, Haenam-gun Sanih-myeon nokcheongja doyoji—Jeonnam Haenamgun Sanih-myeon Jinsan-ri [Green celadon kiln sites in Sanih-myeon, Haenam-gun—Jinsan-ri, Sanih-myeon, Haenam-gun, Jeonnam].

⁴ Jang Namwon, Goryeo junggi cheongjaui yeongu [Research on celadon in the middle Goryeo dynasty], pp. 108–15.

⁵ Existing research has focused on underglaze iron painted celadon. However, since underglaze iron painted white porcelain was also produced, this paper will use the term “underglaze iron painted ceramics (鐵畫瓷器).”

⁶ Gao Yuxie, Goryeo cheongja [Celadon in the Goryeo dynasty]. Go Yu-seop refers to underglaze iron painted celadon as “celadon with painting (huacheongja 畫青磁),” with design motifs painted with white or black clay slip under yellowish brown glaze on a rough clay body.

⁷ Nomori Ken, Kōrai tōji no kenkyū.

⁸ Hasebe Gakuji, “Tetsu-e seiji, tessai-de, tetsu-yū.”

⁹ Choe Sun-u, “Kōrai tōji no hennen.”

¹⁰ Nishida Hiroko, “An examination of underglaze iron painted celadon in the Goryeo dynasty—with a focus on underglaze iron painted celadon basins.”

¹¹ Chung Yangmo, “Research on celadon in the Goryeo dynasty.”

¹² Chung Yangmo, “Celadon in the Goryeo dynasty.” His opinion that underglaze iron painted ceramics were divided into two groups of Goryeo and Cizhou-yao corresponds to that of Nishida Hiroko, but their opinions should be reconsidered, since central design motifs appeared in both Goryeo and China.

¹³ Gang Gyeong-suk, Hanguk dojasa [History of Korean ceramics].

¹⁴ Itō Ikutarō, “Kōrai seiji no tetsu-e to tessai [Iron painting and iron coating on Goryeo celadon].” It is stated that liberal patterns predate fine ones; in fact, fine patterns were excavated in lower layers than the liberal ones. See endnote 3.

¹⁵ Jo Gi-jeong, Nokcheongja sogo [Examination of green celadon].

¹⁶ Yun Yong-i, "A transition of ceramics in the Goryeo dynasty."

¹⁷ Yun Yong-i, *Hanguk dojasa yeongu*, pp. 160–203.

¹⁸ Choe Geon, "Lineage and development of kiln sites in the Goryeo dynasty." His opinion should be reexamined. See Chang Nam-won, "The characteristics of celadon in the eleventh and twelfth centuries by examining common appearance of the Gangjin type."

¹⁹ Choe Geon, "Characteristics and development of underglaze iron painted celadon." According to the excavated kiln sites, however, underglaze iron patterns appeared at least in Gangjin and Buan in the middle of the Goryeo dynasty, and the patterns in the areas were developed around the same time as Jinsan-ri or later than Jinsan-ri.

²² Chungju-sanseong mit jik-dong gobungun balguljosa bogoseo [Report of excavation in hillfort of Chungju and tombs of Jik-dong], figs. 13, 28-2.

²³ Gyeongsanlim-dang yujeok 1–(3 [Remains of Gyeongsanlim-dang].

²⁴ Chungju Danwol-dong gobungun icha balguljosa bogoseo [Report of the second excavation in the tombs of Danwol-dong, Chungju], 76–7.

²⁵ Cheongju Yongam yujeok (2) -- bonmun [Remains of Yongam, Cheongju—the Text].

²⁶ Gongju Geumhak-dong gobungun [Tombs of Geumhak-dong, Gongju].

²⁷ Tamjin damokjeokdaem sumoljiyeoknae munhwayujeok 2--gamulmakidaem sumoljigu sigul josabogo [Report on flooded area of gamulmaki dam—cultural assets in the flooded area of Tamjin multipurpose dam 2], pp. 131-178, Photo 12.

²⁸ Yeongam wolchul-san jesa yujeok [Remains of ritual ceremony in Wolchul-san, Yeongam], Color photo 5.

²⁹ Mireuksa [Mireuksa Temple]; Mireuksaji yumul jeonsigwan [Pavilion for relics in the temple site of Mireuksaji].

³⁰ Jang Namwon, *Goryeo junggi cheongjau yeongu* [Research on celadon in the middle Goryeo dynasty], pp. 115–6.

³¹ Geodonsaji balguljosa bogoseo [Reports on the excavation of the temple site of Geodonsa].

³² One opinion holds that the production period of the celadon in the Wando site was later than that of the later halo-shaped foot because underglaze iron patterned celadon from the seabed of Wando corresponds more closely to the 10-2 layer of the Yongun-ri kiln site, Gangjin. For commentary, see Lee Song-hee, *Wandohaejeo chulto jagireul tonghan nokcheongja yeongu* [Research on green celadon through examining ceramics from the seabed of

Wando], and Jang Namwon, *Goryeo junggi cheongjai yeongu* [Research on celadon in the middle Goryeo dynasty], chapter 4–2.

³³ *Bangsan daeyo* [Bangsan kilns], p. 151; Lee Jong-min, “An examination of managing period of brick kilns through examining excavated kiln sites—with a focus on the kiln sites of Bangsan-dong, Siheung and Seo-ri, Yongin”; Lee Jong-min, *Hangukui chogi cheongja yeongu* [A study of early Korean celadon], pp. 132–5.

³⁴ *Yongin Seo-ri goryeo baekjajo* [White porcelain kiln of the Goryeo dynasty in Seo-ri, Yongin], excavation report 1, pp. 154–5.

³⁵ *Yongin seo-ri goryeo baekjajo* [White porcelain kiln of the Goryeo dynasty in Seo-ri, Yongin], pp. 131–2, 146, 175, 177, 241, 257, 308–9, 324, 344; Jeon Seung-chang, “Examination of relics excavated in the kiln sites of Seo-ri, Yongin,” pp.15–32.

³⁶ *Yongin seo-ri goryeo baekjajo* [White porcelain kiln of the Goryeo dynasty in Seo-ri, Yongin], excavation report 2, pp. 196–7. It has been recently suggested, however, that the later limit of the Korean-style halo-shaped foot was at the end of the eleventh century or the early twelfth century.

³⁷ Since a drum has a long body, it is sometimes not glazed on the central portion but only on both ends.

³⁸ Kim Gu-gun, “Regarding early celadon kiln sites around Daegu.”

³⁹ According to a ground survey by the Haegang Ceramic Museum.

⁴⁰ National Museum of Korea, *Gangjin Yongun-ri cheongjayoji balguljosa bogoseo* [Report on the celadon kiln sites of Yongun-ri, Gangjin], Illustrations; National Museum of Korea, *Gangjin Yongun-ri cheongjayoji balguljosa bogoseo* [Report on the celadon kiln sites of Yongun-ri, Gangjin], Text; Chang Nam-won, *Goryeo junggi cheongjai yeongu* [Research on celadon in the middle Goryeo dynasty], p. 92.

⁴¹ *Gangjinui cheongjayoji* [Celadon kiln sites in Gangjin].

⁴² *Haenam jinsan-ri nokcheongja yoji* [Green celadon kiln site of Jinsan-ri, Haenam].

⁴³ Jo Gi-jeong, *Nokcheongja sogo* [Examination of green celadon]; *Haenamui cheongjayoji* [Celadon kiln sites in Haenam].

⁴⁴ *Ibid.*, pp. 35–68.

⁴⁵ *Buan jinseo-ri cheongja yoji* [Celadon kiln site of Jinseo-ri, Buan], pp. 55–8.

⁴⁶ *Gakji sibalgul josa bogoseo* [Report on the excavation of various areas], p. 121.

⁴⁷ Regarding celadon excavated in the number 7 area of Yucheon-ri, Buan, see *Buan Yucheon-ri 7guyeok cheongja*

yojigun balguljosa bogoseo [Report on the excavation of celadon kiln sites in the number 7 area of Yucheon-ri, Buan], pp. 295–301.

⁴⁸ Buan Yucheon Jinseo-ri cheongjayoji balguljosa bogoseo [Report on the excavation of celadon kiln sites of Yucheon and Jinseo-ri in Buan].

⁴⁹ Eumseong Saeng-ri cheongja gamateo [Celadon kiln site of Saeng-ri, Eumseong], p. 70. It is noteworthy that fragments of underglaze iron painted drums were excavated in the celadon kiln site of Bojeong-ri, Yongin, which turned out to produce similar products as Saeng-ri, Eumseong.

⁵⁰ Choe Geon, “The lineage and transition of Korean ceramic kilns in the end of the Silla and the early of the Goryeo Dynasties,” pp.78– (Photo 7). This paper asserts that the characteristics of celadon in the middle period appeared in the area in the early eleventh century. Therefore, According to the paper, therefore, this can be important in considering the later limit of early celadon to be the end of the tenth century.

⁵¹ The area became known after Hong Sunuk found it. After the flood of Gangreung in autumn 2003, underglaze iron painted fragments were collected by Hong Sunuk, and I also saw these.

⁵² Jang Namwon. Goryeo junggi cheongjaui yeongu [Research on celadon in the middle Goryeo dynasty], p. 106.

⁵³ Yanggu-gun, Yanggu Bangsanui doyoji [Kiln sites of Bangsan, Yanggu], pp. 194–7.

⁵⁴ Jang Namwon. Goryeo junggi cheongjaui yeongu [Research on celadon in the middle Goryeo dynasty], p. 92.

⁵⁵ Yun Yong-i, Hanguk Dojasa yeongu [Research on the history of the Korean ceramics], p. 506 (footnote 2).

⁵⁶ Aside from an underglaze iron painted technique, there are examples of other techniques: white inlay technique in Bangsan-dong, Siheung, white inlay with black background (黑地白象嵌) in Jungdeok, Seo-ri, Yongin, and black inlay in Yangjae-ri, Hampyeong.

⁵⁷ Choe Geon, “Characteristics and development of underglaze iron painted celadon,” p. 134. However, this opinion is reasonable only if the celadon of Gangjin was produced in Korea’s early developmental stages.

⁵⁸ Gangjin Samheung-ri jeosuji sungsang saeopjigunae doyoji balguljosa hyeonjang seolmyeonghoe jaryo [Explanation data on the excavation of kiln sites in the planned area for a reservoir of Samheung-ri, Gangjin].

⁵⁹ Changsha-yao [Changsha ware]; Li Xiaowei, Changsha-yao—Da Tang wenhua huihuangzhi jiaodian [Changsha kiln: The resplendant focus of the Tang culture], p. 11.

⁶⁰ It is also called black decoration (黑彩), designating black design motifs regardless of the pigment ingredients. In China, it is also considered that black patterns were made using pigment or glaze containing much iron.

Nevertheless, unlike Korea, it is commonly called black flower (黑花), but is not called iron painting (鐵畫) or copper painting (銅畫) after the ingredients of pigments.

⁶¹ Yu Jiadong. Jiangxi Jizhou-yao [The Jizhou kiln in Jiangxi].

⁶² Geng Baochang, ed., Gong-yao gutaoci yanjiu [Research on antique ceramics of Gong-yao].

⁶³ Guantai Cizhou-yao zhi [The Cizhou-yao Kiln Site in Guantai].; Osaka Shiritsu Bijutsukan. Shiro to kuro no kyōen: Chūgoku Jishūyō-kei tōki no sekai [Juxtaposition of white and black: the world of Chinese Cizhou-type ware].

⁶⁴ Guangzhoushi wenwu guanli weiyuanhui [Committee of cultural administration in Guangzhou City], Xianggang Zhongwen daxue wenwuguan [Department of culture at Hongkong Zhongwen University], Guangzhou Xicun-yao [Xicun-yao of Guangzhou].

⁶⁵ Guangdongsheng Museum, Xianggang daxue Feng Pingshan Museum. Guangdong Tang Song yaozhi chutu taoci [Ceramics finds from Tang and Song kilns in Guangdong].

⁶⁶ Dehua-yao/Fujiansheng bowuguan [Dehua ware in the Fujian Provincial Museum].

⁶⁷ He Zhenliang and Lin Demin. Cizao-yaoqi [Cizao-yao ceramics].

⁶⁸ Lu Pu. Liaodai taoci [Ceramics in the Liao dynasty]. Ceramics with decoration of black flowers on a white background (白地黑花瓷) were produced in Gangwa-yao of Chifeng, Inner Mongolia and in Gangguantun-yao of Liaoning-sheng. They were also produced in Xiangyin-yao, Hunan-sheng. For this, see Zhou Shirong and Liu Yongchi, Xiangyin Baimei-yao di 9 ji [Baimei-yao, Xiangyin], pp. 30-46.

⁶⁹ Silongkou Yue-yao zhi [The Yue-yao kiln site of Silongkou], p. 284.

⁷⁰ Nishida Hiroko, "An examination of underglaze iron painted celadon in the Goryeo dynasty—with a focus on underglaze iron painted celadon basins," pp. 42–53.

⁷¹ Chung Yangmo and Tae Hwa-su, Goryeo doja myeongmun [Ceramic inscriptions in the Goryeo dynasty], pp. 114–5 (Fig.110), 118 (Fig. 112). In the catalogue, the bottle (maebyeong) with this kind of opening is dated to the eleventh century.

⁷² See endnote 33.

⁷³ Yongin seo-ri goryeo baekjajo [White porcelain kiln of the Goryeo dynasty in Seo-ri, Yongin], excavation report 1.

⁷⁴ Bottles (maebyeong) were not found in layers 9 and 10-1 of Yongun-ri, Gangjin.

⁷⁵ Morimoto Asako and Katayama Mabi, "Hakata shutsudo no Kōrai, Chōsen tōji bunrui shikian [Proposed classification of Goryeo and Joseon ceramics excavated in Hakata]"; Chang Nam-won, "The characteristics of

celadon in the eleventh and twelfth centuries by examining common appearance of the Gangjin type," pp. 77–100; Chang Nam-won, *Goryeo junggi cheongjai yeongu* [Research on celadon in the middle Goryeo dynasty], pp. 172–3; Katayama Mabi, "Celadon in the Goryeo dynasty excavated in Kyushu region—with a focus on chronology about early materials."

⁷⁶ Chung Yangmo and Tae Hwa-su, *Goryeo doja myeongmun* [Ceramic inscriptions in the Goryeo dynasty], figs. 108, 109.

⁷⁷ Itō Ikutarō, "Kōrai seiji no tetsu-e to tessai [Iron painting and iron coating on Goryeo celadon]," fig. 10; Chung Yangmo, "Painted celadon bottle with the poem inscription of the second year of Zhizheng," p. 443; Gu Il-hoe, "An examination of celadon which Mr. Dongwon donated," p. 14.

Captions

Fig. 1. Cylindrical cup with white-painted and underglaze iron painted dots, excavated in the tomb Seok-reung of King Huijong

Fig. 2. Vase with long neck and wide mouth, excavated in the tomb in Danwol-dong, Chungju

Fig. 3. Underglaze iron patterned bottle and other pieces excavated in tomb number 7 in Geumhak-dong, Gongju

Fig. 4. Underglaze iron patterned celadon vase with long neck and wide mouth, excavated in Habangchon, Jangheung

Fig. 5. Underglaze iron patterned celadon lid, excavated in the Geodonsa temple site, Wonju

Fig. 6. Underglaze iron painted bottles (*maebyeong*), salvaged off Eodu-ri, Wando

Fig. 7. Underglaze iron painted celadon drum body, salvaged off Eodu-ri, Wando

Fig. 8. Incised white porcelain drum body (left) and underglaze iron patterned white porcelain drum body (right), excavated in the third period layer of the kiln site in Bangsan-dong, Siheung

Fig. 9. Underglaze iron patterned white porcelain fragments, excavated in the third layer of the kiln site in Jungdeok, Seo-ri, Yongin

Fig. 10. Underglaze iron patterned white porcelain drum body, excavated in the kiln site of Sangban, Seo-ri, Yongin

Fig. 11. Underglaze iron patterned fragments, in the kiln site in Changpyeong-ri, Chilgok

Fig. 12. Underglaze iron patterned celadon bottle, in kiln site number 10 in Yongun-ri, Gangjin

Fig. 13. Underglaze iron patterned celadon bottle, in kiln site number 17 in Jinsan-ri, Haenam

Fig. 14. Underglaze iron patterned celadon drum body, in kiln site in Saeng-ri, Eumseong

Fig. 15. Fragments with an underglaze iron pattern, in kiln site in Songgye-ri, Jecheon by ground search

Fig. 16. Melon shape fragment of underglaze iron painted white porcelain, in kiln site number 10 in Sangmuyong-ri, Bangsan, Yanggu

Fig. 17. Underglaze iron patterned celadon bottle, salvaged from the sea bed off Eodu-ri, Wando

Fig. 18. Underglaze iron patterned ceramics, Xicun-yao, Guangzhou, China

Fig. 19. Underglaze iron patterned drum body, Silongkou, Cixishi, Zhejiang province, China

Fig. 20. Underglaze iron patterned bottle with horizontal opening