Reexamination of the Inscriptions on the Maitreya and Amitabha Statues from Gamsansa Temple through Reflectance Transformation Imaging

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Introduction

The standing Maitreya and Amitabha statues from Gamsansa Temple (甘山寺) currently displayed in the Buddhist Sculpture Gallery of the National Museum of Korea, respectively designated as National Treasures No. 81 and No. 82, are well-known works of ancient Korean Buddhist art and hold great significance in Korean art and history. One of the primary obstacles to studying ancient Korean Buddhist sculpture from the Three Kingdoms (57 BCE–668) to Unified Silla (統一新羅, 668–935) periods is that most extant examples lack inscriptions or relevant documents indicating their date of production or their creators. However, these statues from Gamsansa Temple feature inscriptions on the back of their nimbuses that help identify the date of production, commissioner, and motive for their creation (Figs. 1 and 1-2). The content of the inscriptions relate that an individual named Kim Jiseong commissioned the construction of Gamsansa Temple and enshrined the statues of Maitreya and Amitabha there in 719 as a prayer for the souls of his deceased parents. The inscriptions on the statues had been partially known since extracts from them are included in the Samguk yusa (三國遺事, Memorabilia of the Three Kingdoms) compiled by Monk Ilyeon (一然, 1206–1289) during the Goryeo (高麗, 918–1392) period.¹

The details of the inscriptions became more completely known with the discovery of the two statues in 1915. These two statues have been subjects for research in diverse fields (e.g., history, art history, epigraphy) for more than a century since they are rare surviving examples that bear inscriptions coinciding with historical records and they provide style benchmarks for dating Buddhist statues from the Unified Silla period.

The full inscriptions of the two statues were first presented in the Joseon geumseok chongnam (朝鮮金石總覽, Comprehensive survey of epigraphs of Joseon) published by the Government-General of Korea (朝鮮總督府) in 1919 during the Japanese colonial period. They have since been modified or complemented by later epigraphic studies and related essays.² However, the inscriptions have been worn down over the centuries and some characters are illegible using the naked eye. Rubbings of the inscriptions also fail to provide sufficiently precise information on the original inscriptions. This has constrained the study of the inscriptions and led to subtle differences in interpretations of the inscriptions and varying opinions on the dating of these two statues.

Against this backdrop, the National Museum of Korea decided to employ reflectance transformation imaging (RTI) to obtain basic materials for research using methods that ensure the integrity of the two statues while improving the identification
of the original inscriptions. RTI is a rather new approach in Korea, but it has been previously used in Western institutions to decipher inscriptions by photographing an object under different lighting conditions. By processing the RTI outputs and observing them through appropriate software, inscriptions illegible to the naked eye can more easily be identified. The National Museum of Korea conducted the RTI to identify the inscriptions on the Gamsansa statues in 2012 and 2013. This paper examines the outcomes from the 2013 RTI investigation and presents details on the RTI method as applied.

Overview of the Statues from Gamsansa Temple

Before discussing the identified inscriptions, it is necessary to examine their content, the sculptural styles of the statues, and the related academic issues. According to the inscriptions on the nimbus of both statues, a Silla official named Kim Jiseong (金志誠, b. 652) of the jungachan (重阿湌) grade commissioned the construction of Gamsansa Temple and the production of the statues of Amitabha and Maitreya on his private lands on the fifteenth day of the second month of the gimy (己未) year during the Kaiyuan era (開元, 713–741), the early half of the reign of Emperor Xuanzong (玄宗, r. 712–756) of the Tang dynasty (唐, 618–907). This corresponds to 719, the eighteenth year of the reign of King Seongdeok (聖德王, r. 702–737). This project was undertaken to offer prayers for his deceased father Injang (仁章), who was an ilgilchan (一吉湌) grade official, and his deceased mother, named Gwanchori (觀肖里). It was initiated on the day of the year on which Shakyamuni is believed to have entered nirvana (the fifteenth day of the second month). Kim Jiseong served in several posts before becoming Sirang (侍郞, vice-minister) at the Jipsabu (執事部, State Secretariat). Some previous studies have suggested that Kim Jiseong visited Tang China as a member of the Silla mission to the Tang dynasty known as the Gyeondangsa (遣唐史) in 705, the fourth year of the reign of King Seongdeok. After retirement at the age of 67 in 716, he resided in a rural village where he pursued a Taoist way of life free from worldly concerns, as suggested by Laozi (老子).
and Zhuangzi (莊子). However, he also studied Buddhist dharma by reading the *Yogacarabhumi Sastra* (瑜伽師地論, Discourse on the stages of yogic practice) by Asanga (fl. fourth century CE), also known as Wuzhuo (無著) in China and Muchak in Korea, as well as other Buddhist scriptures. In 719, Kim commissioned Gamsansa Temple on his lands to offer prayers for his deceased parents and other family members as well as for a high-ranking official close to him. He died one year later in 720.

The final portion of the inscription on the Maitreya statue reads that Kim scattered the ashes of his mother, who died at the age of sixty-six, in Heunji on the east coast of Korea. The inscription on the Amitabha statue tells that the ashes of Kim’s father, who died at the age of forty-seven, had been scattered at the same spot. This indicates that Kim Jiseong commissioned the Maitreya statue for his deceased mother and the Amitabha statue for his deceased father. Kim’s prayers inscribed on the statues deliver his wishes that the king live a long and happy life. He also prays that his brothers and sisters, former and present wives, his brother born to a different mother, the ichan (二湌)-grade official Gaewon (愷元, dates unknown), and all human beings in the universe may rise above the world and attain Buddhahood. Monk Ilyeon’s *Samguk yusa* presents extracts from the inscriptions, including the year the statues were erected, the patron of the statues, and the subjects of the prayers, but it leaves out any mention of the personal history of Kim Jiseong. However, discrepancies in the names of certain people appear in the two inscriptions, and they include expressions that may cause readers to confuse the subjects of the prayers with the person offering them (Kang Jonghun 2011, 20).

Regarding the names, the patron is indicated as “金志誠” (Kim Jiseong) on the Maitreya statue and as “金志全” (Kim Jijeon) on the Amitabha statue. The name of Kim’s brother is written “良誠” (Yangseong) on the Maitreya statue and “梁誠” (Yangseong) on the Amitabha statue, while the name of his sister appears as “古巴里” (Gopari) on the Maitreya statue but as “古寶里” (Gobori) on the Amitabha statue. These inconsistencies indicate that different Chinese characters were used to transcribe a particular phoneme, and also raise the possibility that the two inscriptions were carved by a different person. Meanwhile, the inscription on the Maitreya statue includes the expression “Disciple Jiseong,” addressing Kim Jiseong in a modest manner, while the corresponding portion in the inscription on the Amitabha
statue refers to Kim Jiseong as “Jungachan Kim Jiyeon,” a more respectful manner of address. In addition, in the middle of the Amitabha statue inscription, it is recorded that the text was authored by a *nama* (奈麻)-grade official named Chong (聰) and the calligraphy was performed by Monk Gyeongyung (京融) and a *daesa* (大舍)-grade official named Kim Chwiwon (金驟源). At the end of the same text it is recorded that Kim died on April 22, 720. In view of the above, it is assumed that the Maitreya statue was completed while Kim was alive and its inscription thus reflects his own narrative, while the inscription on the Amitabha statue was written by the *nama*-grade official Chong following the king’s commands after the death of Kim Jiseong. The disparities in the inscriptions suggest the possibility that they were written by different people and that the text on the Amitabha statue was
carved at a later point in time. Any reexamination of the two inscriptions therefore requires a comparison of the calligraphy style and other factors in addition to the identification of the inscribed characters.

Despite the differences in the styles of the inscriptions, the two statues from Gamsansa Temple do not differ greatly in terms of sculptural elements, and therefore are presumed to have been created around the same time. They are considered masterpieces of ancient Korean sculpture as they reflect the stylistic development of the eighth-century Buddhist sculpture of Unified Silla. They feature large, puffy eyes and the wide, flat face prevalent in Buddhist sculpture from the preceding Three Kingdoms period (Figs. 1-2 and 1-3). Their scale provides an impression of both massiveness and stillness. As objects of worship, the faces of the statues are elaborately carved; however, their bodies are flat as if they were closely attached to the nimbuses. They do not show the dynamic expressions of the body found in the sculptures associated with Seokguram Grotto (石窟庵) from the mid-eighth century that emphasize the volume and three-dimensionality of the figures. This may be because their hands and arms do not stretch out, but instead adhere to the body as if being impeded by a transparent barrier. However, the sculptor(s) of the two statues must have been aware of the style that was becoming the vogue in East Asia and accordingly reflected stylistic developments in his (or their) creations.

The Maitreya statue from Gamsansa Temple is renowned for its exotic and lavish accessories; the bodhisattva wears a crown decorated with jewels while two necklaces and a shawl drape across the chest and arms (Fig. 1-2). The accessories on the arms and the beads on the skirt are carved in a sophisticated manner. The main features of this Maitreya statue, including its accessories, cloth, manner of dress, and pose, can be found in the Tang dynasty Eleven-faced Avalokiteshvara statue from Baoqingsi (寶慶寺) Temple in Xian, China and the statue of the same bodhisattva at Horyuji Temple (法隆寺) in Japan. This indicates that the sculptor of this Maitreya statue was aware of the image of a bodhisattva with voluptuous body and lavish adornment that was circulating widely at the time in East Asia and tried to embody it in this work. However, the Gamsansa example differs from most other Maitreya images in terms of iconography and style in that it is standing while Maitreya is usually represented as seated, and in that it has an image of Amitabha Buddha on its crown, similar to an Avalokiteshvara image. The Amitabha statue reveals the outlines of its body through the tightly adhered robe drooping from the shoulders to the feet. The wave-like drapery lines are repeated in a symmetrical manner that emphasizes the volume and the protruding or flat surfaces of the statue (Fig. 1-3). Examples of a similar style include the sandstone standing Buddha statue at the Gyeongju National Museum, the standing Buddha statue carved in the south side of a rock at the Gubulsua Temple (掘佛寺) site, and other gilt-bronze Buddha statues. The origins of the style can be found in Tang-period Buddhist statues influenced by sculpture from the Gupta period of India (Kim Lena 1989, 206–238). It is thought that Chinese Buddhist monks made pilgrimages to sacred Buddhist sites in India and brought Indian Buddhist statues back to China where the styles in the statues they observed were emulated and eventually transmitted to Unified Silla. The Amitabha statue from Gamsansa Temple does not accentuate three-dimensionality to the same degree as do most Silla Buddhist statues from the mid-eighth century, but it does demonstrate an artistic attempt to adopt the era’s emerging trend of imbuing sculptures with an ample sense of volume, dynamism, and realism.

The Maitreya and Amitabha statues from Gamsansa Temple differ in the form of their nimbuses and pedestals. The nimbus and body of the Maitreya statue were made separately from the pedestal and then set into it, while the nimbus, body, and upper part of the pedestal of the Amitabha statue were carved together out of the same stone and then placed on the lower portion of the pedestal (Figs. 1-4 and 1-5). These structural differences, along with the discrepancies in the inscriptions, can be viewed as evidence that the two statues were not produced around the same time. However, they are the result of differences in size and nature of the stone and production methods involved and cannot be considered determinant factors for dating the two statues to different periods. It is therefore generally believed that the two statues were produced around the same time, despite the discrepancies in the content and style of the inscriptions and the possibility that the inscription on the Amitabha statue might have been carved at a later point after the death of Kim Jiseong.

Several opinions have been expressed concerning the motive for enshrining the two statues at Gamsansa Temple. Some focus on the influence of the Beopsangjong (法相宗) sect of Buddhism, while others relate it to trends in contemporaneous Chinese Buddhist art or Kim Jiseong’s personal piety and visual experiences. Precisely where in the temple the statues were enshrined is also a matter of controversy. The Samguk yusa records that the Maitreya statue was placed in the Geumdang (金堂), the main hall of the temple, but it makes no mention of the location of the Amitabha statue. Therefore, one group of scholars argues that the two statues were enshrined separately (with
the Amitabha statue placed in the lecture hall), while another opinion purports that they were enshrined together in the same hall. This issue remains a matter of debate and requires further study from diverse perspectives drawing upon the RTI results.

Newly Identified Characters

The RTI results allowed the identification of the content of the inscriptions on the statues from Gamsansa Temple and provide valuable information on the background of the creation of the statues. They also complement previous studies. Significant findings from the RTI include the exact number of inscribed characters and newly identified characters (in this article, “characters” refers to “classical Chinese characters”). Previously, it was believed that 381 characters were inscribed on the Maitreya statue and 392 characters on the Amitabha statue. The back of the Maitreya statue has a grid of lines with intervals between 4.3 centimeters and 4.5 centimeters both lengthwise and widthwise. A Chinese character is inscribed within each of the sections formed by this grid. However, these lines only barely remain on the Amitabha statue. The 2012 RTI revealed that the Maitreya statue has 381 characters and the Amitabha statue has 389 characters, three less than previously believed. It was found that the final three characters that had been presumed to exist are actually absent from line 17 of the Amitabha statue’s inscription.

The Joseon jeumseok chongnam and all other later publications assumed that the inscription on the Amitabha statue would have 392 characters since the inscription generally begins and ends in the same row. Line 17 of the inscription on the Amitabha statue was thus assumed to have three more characters at its end than are actually present. Also, when considering the content, having the three Chinese characters “書奉敎” meaning “writing upon command” would have conformed to the convention of revealing the name of the calligrapher (Katsuragi Sueji 1935, 208–209).

<table>
<thead>
<tr>
<th>Line 21</th>
<th>Line 20</th>
<th>Line 19</th>
<th>Line 18</th>
<th>Line 17</th>
<th>Line 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>十六頭年四月十四日書命之</td>
<td>新分奉敎沙門釋京融大舍金喜源</td>
<td>山鬼章一五零零年四月八日入妙</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
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</tbody>
</table>

Extract from the Joseon jeumseok chongnam

However, the RTI found no evidence that any character had been inscribed at the corner of the nimbus where these final three characters for line 17 would have been expected to exist. When compared with nearby portions with inscribed characters, there was no trace of a character having disappeared due to abrasion, and it became clear that no character had ever been inscribed in this space (Fig. 2). A comparison with other blank spaces between characters in the inscription provides further evidence that there were no characters at the end of line 17 from the beginning (Fig. 3). Why these final three characters were never included has yet to be understood, and further in-depth study should be pursued.

The RTI on the Maitreya statue identified the same number of characters as previously believed, but it found that the Chinese characters “六” and “十,” the second and third characters in line 22, were carved together in a single section instead of separately (Fig. 4). This can be verified by comparing the space for these two characters with that for a single character.

This RTI also allowed the clear identification of characters
that had been indistinct and consequently fueled controversy. In the Amitabha statue, the sixteenth character in line 20 was found to be “六” (Fig. 5). Two opinions had existed regarding this character: some saw it as “六” (six) and related to the age of Kim Jiseong, while another theory proposed later suggested it to be “在” and forming part of the phrase “歲在十九,” meaning the nineteenth year of King Seongdeok’s reign (Moon Myungdae 2003, 91–92; Kim Yeongmi 1988, 374). Since the character could in fact be clearly identified as “六” and the phrase to be “歲六十九,” it is confirmed that Kim Jiseong died at the age of sixty-nine. The fourteenth character of line 21 was identified as “賜” (Fig. 6). In the case of the Maitreya statue, the RTI clarified the shapes of two previously unidentified characters, the tenth character in line 19 and the sixth character in line 20 (Figs. 7 and 8).

According to these RTI results, two characters in the Maitreya statue had been misinterpreted and the existing understanding had to be modified accordingly. The Chinese character “閒” (free; leisurely) in line 9, which had formerly been believed to be part of the expression “閒野,” meaning “sequestered rural area,” was actually identified to be “閑,” but still conveying the same meaning. This character was described as “閑” in the Joseon geumseok chongnam and other later publications on epigraphy (Fig. 9). The ninth character in line 19, previously understood to be “誠” (truly), was identified as “城” (fortress). Therefore, the existing interpretation of this line, which mistook “fortress” for “truly,” should be changed as follows: “even if the stones that built the fortress (wall) might all disappear.” In most papers and relevant publications, Amitabha in line 3 is transcribed as “阿彌陀,” but the third character is actually “陁” instead of “陀,” as recorded in the Joseon geumseok chongnam (Fig. 10). The first character in line 15, previously considered “休,” is now thought to be “烋” as there is another character under “休” (Fig. 11). The character “无” in line 15 is recorded as “旡” in the Joseon geumseok chongnam, but the actual character is “无,” as cited in most publications (Fig. 12).

In the Amitabha statue, “疏” in line 8 has been one of the more controversial characters. It has been presumed to be “疎,” “疎,” or “綀,” but considering the meaning of the text, it is likely
Fig. 11. "陁" in line 3 of the inscription on the Maitreya statue

Fig. 12. "烋" in line 15 of the inscription on the Maitreya statue

Fig. 13. "无" in line 15 of the inscription on the Maitreya statue

Fig. 14. "疏" in line 8 of the inscription on the Amitabha statue

Fig. 15. "卄" in line 21 of the inscription on the Amitabha statue

Fig. 16. "東海" in line 18 of the inscription on the Amitabha statue

Fig. 17. "欣支" in line 19 of the inscription on the Amitabha statue

Fig. 18. "邊散" in line 19 of the inscription on the Amitabha statue
to be a simplified version of “疏” (Fig. 13). Through the RTI, the eighth character in line 21 was identified as “卄” instead of “廿” (Fig. 14). The phrase “東海攸友邊散之” in lines 18 and 19, which was cited in the Samguk yusa, was identified as “東海欣支邊散也” (Figs. 15 through 17). It is likely that Ilyeon mistook “攸友” for “欣支” in the original inscription or that “欣支” was mistakenly engraved when making a print for the Samguk yusa.

Simplified Characters and Variant Characters

The RTI found frequent use of simplified characters in a semi-cursive or cursive script and variant characters in the inscriptions of the Maitreya and Amitabha statues from Gamsansa Temple (Figs. 19 through 33). Overall, the Maitreya statue shows a large number of simplified characters. For example, “無” (none; lack) is inscribed in its simplified version in line 4, and its variant form “无” also appears in the inscription. As the original version “無” is used when referring to the name of a monk “無着,” three versions of the same character were used within a single inscription. Simplified characters were rarely used in either inscription for the names of people, such as Kim Jiseong (金志城) and Muchak (無著), but in line 5 of the Maitreya statue’s inscription, the characters “志誠” referring to Jiseong are slightly scrawled.

### Table 1. Simplified or variant characters in the inscription of the Maitreya statue

<table>
<thead>
<tr>
<th>Line</th>
<th>Simplified or variant characters</th>
<th>Line</th>
<th>Simplified or variant characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>爲, 章</td>
<td>12</td>
<td>創, 務, 無, 罄</td>
</tr>
<tr>
<td>3</td>
<td>向, 埤</td>
<td>13</td>
<td>舊, 質, 以, 比, 側, 現</td>
</tr>
<tr>
<td>4</td>
<td>盖, 能, 寂, 無</td>
<td>14</td>
<td>勝, 湖</td>
</tr>
<tr>
<td>5</td>
<td>所, 以, 嚴</td>
<td>15</td>
<td>備</td>
</tr>
<tr>
<td>6</td>
<td>猜, 備, (忽, 命)</td>
<td>16</td>
<td>祕</td>
</tr>
<tr>
<td>7</td>
<td>無, 遠, 舊, 景, 宿, 水, 慕</td>
<td>17</td>
<td>賽, 任, 嘉</td>
</tr>
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<td>8</td>
<td>事, 志, 宗, 希, 閑, 六</td>
<td>18</td>
<td>奉, 常</td>
</tr>
<tr>
<td>9</td>
<td>今, 以, 違, 質</td>
<td>19</td>
<td>恭, 慶</td>
</tr>
<tr>
<td>10</td>
<td>六</td>
<td>20</td>
<td>備, 善, 義</td>
</tr>
<tr>
<td>11</td>
<td>願, 遠, 季</td>
<td>21</td>
<td>首, 任, 因, 順</td>
</tr>
<tr>
<td>12</td>
<td>交, 者, 章</td>
<td>22</td>
<td>章</td>
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</table>

Table 2. Simplified or variant characters in the inscription of the Amitabha statue

<table>
<thead>
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<td>願, 以, 宗, 榮, 玲</td>
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<td>15</td>
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<td>5</td>
<td>以</td>
<td>16</td>
<td>以</td>
</tr>
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<td>向, 埤</td>
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<td>11</td>
<td>願, 遠, 季</td>
<td>21</td>
<td>首, 任, 因, 順</td>
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### Style of Calligraphy

The inscription on the Maitreya statue and that on the Amitabha statue differ in many respects, which fuels the supposition that the inscriptions of the two statues might not have been produced around the same time. According to the RTI results, each inscription features a distinct style of calligraphy. The inscription on the Maitreya statue has generally flowing calligraphy, probably because of the frequent use of simplified characters. The inscription on the Amitabha statue applies a smaller number of simplified characters and includes many characters with angular edges. The term “山水,” meaning “mountain and water,” was inscribed using simplified characters in semi-cursive or cursive script on the Maitreya statue, but it was rendered in regular script using sharp-edged characters on the Amitabha statue (Figs. 44 and 45). Interestingly, the simplified form of the same character “無” looks different in each inscription (Figs. 46 and 47), indicating that the calligraphy for the two inscriptions was executed by different persons, regardless of whether they date to different periods. The differences in calligraphic style are not sufficient to prove that these two statues sharing a similar sculptural style were produced in different periods and require further study since there are cases of epigraphs being inscribed later on existing steles.

Another important issue regarding the inscriptions is whether certain lines on the Amitabha statue were inscribed later than others. An analysis of the calligraphic style revealed that lines 1 to 15 differ from lines 16 to 21. For example, “金志全” (Kim Jijeon) appears in line 5 and line 20. The strokes of the characters are rather long in the former but relatively short in the latter (Figs. 48 and 49). The same features can be found when comparing the character “奉” in line 7 with the version in line 17 (Figs. 50 and 51). Most of the characters in lines 1 to 15 show relatively long strokes. The inscriptions are carved on the curved
Fig. 19. “彌” in line 2 of the inscription on the Maitreya statue

Fig. 20. “章” in line 2 of the inscription on the Maitreya statue

Fig. 21. “能” in line 4 of the inscription on the Maitreya statue

Fig. 22. “盖” in line 4 of the inscription on the Maitreya statue

Fig. 23. “所” in line 3 of the inscription on the Maitreya statue

Fig. 24. “無” in line 4 of the inscription on the Maitreya statue

Fig. 25. “號” in line 5 of the inscription on the Maitreya statue

Fig. 26. “憲” in line 6 of the inscription on the Maitreya statue

Fig. 27. “願” in line 6 of the inscription on the Maitreya statue

Fig. 28. “班” in line 6 of the inscription on the Maitreya statue

Fig. 29. “寂” in line 4 of the inscription on the Maitreya statue

Fig. 30. “憲” in line 7 of the inscription on the Maitreya statue
“罄” in line 12 of the inscription on the Maitreya statue

“遙” in line 8 of the inscription on the Maitreya statue

“聰” in line 17 of the inscription on the Maitreya statue

“發” in line 3 of the inscription on the Amitabha statue

“兼” in line 9 of the inscription on the Amitabha statue

“雞” in line 7 of the inscription on the Amitabha statue

“過” in line 11 of the inscription on the Amitabha statue

“爾” in line 4 of the inscription on the Amitabha statue

“無” in line 11 of the inscription on the Amitabha statue

“辭” in line 8 of the inscription on the Amitabha statue

“考” in line 12 of the inscription on the Amitabha statue

“願” in line 14 of the inscription on the Amitabha statue
Fig. 43. "後" in line 19 of the inscription on the Amitabha statue

Fig. 44. "山水" in line 7 of the inscription on the Maitreya statue

Fig. 45. "山水" in line 5 of the inscription on the Amitabha statue

Fig. 46. "無" in line 4 of the inscription on the Maitreya statue

Fig. 47. "無" in line 11 of the inscription on the Amitabha statue

Fig. 48. "金志全" in line 5 of the inscription on the Amitabha statue

Fig. 49. "金志全" in line 20 of the inscription on the Amitabha statue
surface of both edges of the two statues. As shown in Figs. 52 and 53, the first two to three lines in both statues are inscribed on the curved surface on the right side and the final six to seven lines on the curved surface on the left side.

In the case of the Amitabha statue, the lines are indented starting from line 16, probably due to limitations on space. Line 16 starts parallel with the sixth character of line 15 and the lines after it also have an indentation of five spaces (See the inscription on the Amitabha statue at the end of this main text). This contrasts with line 3 on the same statue and lines 3 and 16 of the Maitreya statue, since they are inscribed even on the edges as well as on the back of the nimbuses, probably in order to start on a level with the first character of the preceding line. In sum, lines 1 to 15 and lines 16 to 21 differ in terms of calligraphic style and indentation.

The calligraphy of the inscriptions on the two statues can be classified by style into the following three groups: Sides A, B, and C of the Maitreya statue; sides D and E of the Amitabha statue; and side F of the Amitabha statue. However, such differences in the style of the calligraphy cannot be automatically interpreted as evidence of the later addition of the final lines of the Amitabha statue’s inscription. Whether it was the plan from the beginning to employ a different calligrapher for the final seven lines or to leave space for additional lines in the future should be studied through a comparison with similar or other relevant cases.14 In mentioning a person’s age, the Chinese character “年,” meaning “year,” was used in both statues, as in the case of “年六十六” (year sixty-six) and “年卌七” (year forty-seven). Only on side F of the Amitabha statue, which contains the final portion of the inscription, is the character “歳” (meaning “age”) used to refer to the age of Kim Jiseong in “歳六十九” (age sixty-nine). This suggests the possibility that the inscription on side F might have been added later.15

Abrasions on the Inscriptions

The RTI analysis provided useful information beyond the identification of individual characters. It was meaningful for ascertaining the degree of abrasion on the inscriptions, which is expected to provide clues for determining the original location of the two statues within the temple. It is believed that the Maitreya statue was enshrined in the Geumdang, the hall housing the main buddha at the time Ilyeon wrote the Samguk yusa. However, the surviving documents fail to reveal whether the two statues were enshrined together or separately. According to the RTI results, the sides of the nimbuses of both statues are more severely worn than are their backs, which made it difficult to decipher the inscriptions on these sides. Even on the back, the characters at the top and those at bottom showed different degrees of abrasion, with the former more severely degraded in

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**Fig. 50.** “奉” in line 7 of the inscription on the Amitabha statue

**Fig. 51.** “奉” in line 17 of the inscription on the Amitabha statue

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<table>
<thead>
<tr>
<th>F</th>
<th>E</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line 17 to Line 21</td>
<td>Line 3 (latter part) to Line 16</td>
<td>Line 1 Line 2 Line 3 (fore part)</td>
</tr>
</tbody>
</table>

**Fig. 52.** Layout of the inscription on the back of the Amitabha statue

<table>
<thead>
<tr>
<th>C</th>
<th>B</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line 16 (fore part)</td>
<td>Line 3 (latter part) to Line 15</td>
<td>Line 1 Line 2 Line 3 (fore part)</td>
</tr>
</tbody>
</table>

**Fig. 53.** Layout of the inscription on the back of the Maitreya statue

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Fig. 54. Rubbing of the inscription on the Maitreya statue. 117.2 x 133.8 cm. National Museum of Korea (Bongwan 1197)

Fig. 55. Rubbing of the inscription on the Amitabha statue. 117.4 x 118.5 cm. National Museum of Korea (Bongwan 1197)
Fig. 56. Rubbing of the inscription on the Maitreya statue. 98.5 x 95.6 cm. National Museum of Korea (Bongwan 6862, 2-1)

Fig. 57. Rubbing of the inscription on the Maitreya statue. 100.3 x 100.3 cm. National Museum of Korea (Bongwan 6862, 2-2)
both statues. The characters at the bottom were relatively well preserved and allowed easier identification. In the Maitreya statue, each line of the inscription includes eighteen characters, and the inscription shows less damage from the eleventh or twelfth character in each line. In the Amitabha statue, where the inscription has twenty-one characters per line, it is relatively well preserved from the twelfth or thirteenth to the last character. Since the Amitabha statue is slightly larger than the Maitreya statue and its inscription is carved longer vertically, it is likely that the abrasion weakens from a similar point in each statue. Given this, it is probable that the two statues stood nearby at the time of their discovery, or at least for a long period prior to their discovery, and their lower portions were buried to a similar depth. The manner in which the statues were enshrined requires further research from a variety of perspectives, but the degree of abrasion on the inscriptions provides significant information on the statues that is not available in the pertinent literature.

Interestingly, analysis of the RTI results found that the inscriptions were more easily deciphered when the light was cast from the right side rather than from the left. This relates to the correlation between the angle of the lighting and the shadow and indicates the possibility that the engraving tool might have inclined slightly toward the left when carving the inscriptions. With results that allow the minute detection of detailed features of each stroke of the calligraphy, the RTI has provided a new source of data that complements the rubbings of the past.

RTI has limitations, however, since it is not effective for deciphering all types of epigraphic materials and it produces differing results according to the degree of abrasion and the nature of the material on which an inscription is carved. In the case of the two statues from Gamsansa Temple, the inscriptions on the top and both sides proved relatively difficult to decipher. It should also be noted that the complexity of deciphering the results can vary according to when, how, and by whom the RTI is conducted. In this light, RTI results and rubbed copies should be used in tandem when studying inscriptions.

### Rubbings of the Inscription

In 2012 and 2013, in tandem with the RTI analysis, the existing rubbings of the Gamsansa statues’ inscriptions were reexamined and made public. The Japanese Government-General of Korea conducted extensive research on historical relics in Korea and is therefore likely to have produced and utilized considerable quantities of epigraphic materials. The rubbed copies of the Gamsansa statues’ inscriptions in the collection of the National Museum of Korea, which have long been ignored, are assumed to be the outcomes of or materials from such research projects.

Most of the known examples of rubbings of the statues from Gamsansa Temple at the National Museum of Korea originated in the collection of the Museum of the Japanese Government-General of Korea and feature the inscriptions of Fig. 58. Rubbing of the inscription on the Amitabha statue. 115.3 x 107.5 cm. National Museum of Korea (Bongwan 6861, 2-1)

Fig. 59. Rubbing of the inscription on the Amitabha statue. 114.5 x 105.9 cm. National Museum of Korea (Bongwan 6861, 2-2)
these Amitabha and Maitreya statues. These include copies of the inscriptions on the two statues acquired in 1916 (Bongwan 1197; Figs. 54 and 55), two copies of the inscription on the Maitreya statue purchased in 1919 (Bongwan 6862; Figs. 56 and 57), and two copies of the inscription on the Amitabha statue purchased in 1919 (Bongwan 6861; Figs. 58 and 59). Among the many rubbed copies acquired in 1916, the Bongwan 1197 copy has relatively high readability and is likely to have been used as materials for the compilation of the *Joseon geumseok chongnam*. The other four copies show poorer readability and may be unrelated to the *Joseon geumseok chongnam* in that they were purchased materials and entered the museum collection in 1919 after the completion of the compilation of the *Joseon geumseok chongnam*. However, it is also possible that multiple rubbings were made during the research process and they were later purchased to complement existing materials. This matter requires further study.

**Conclusion**

RTI is a useful imaging technique for collecting data on inscriptions without taking rubbings of cultural relics. The RTI conducted in 2012 and 2013 on the statues from Gamsansa Temple revealed that the inscription on the Maitreya statue has 381 characters while that on the Amitabha statue has 389 characters. It also allowed the identification of characters that had remained unclear (e.g., 六 in line 20 and 訧 in line 21 of the Amitabha inscription), the correction of characters that had been interpreted erroneously (e.g., 安, 熊, 城), and the classification of types of simplified characters used in the inscriptions. Consequently, Kim Jiseong's age at the time of his death could be determined, the controversy over some of the unclear characters closed, and the existing interpretation improved.

Another meaningful outcome of the RTI is that three different types of calligraphy used in the inscriptions and their location on the nimbuses could be identified. All of these findings, together with the existing rubbed copies, are expected to serve as basic material for the study of the statues from Gamsansa Temple so as to pinpoint their year of production and determine whether some parts of the inscriptions were added later. In addition, the degree of abrasion on the statues and their inscriptions will also provide useful information for investigating how the statues were enshrined in the temple.

This article is an abridged and revised English version of "Examination of the Inscriptions on the Statues of Amitabha and Bodhisattva Maitreya of Gamsansa Temple Using RTI Images" (RTI 촬영을 통한 감산사 미륵보살상과 아미타불상 명문 검토), previously published in 2013 in *Misul jaryo* (미술자료) 54.

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**Translated by Chung Eunsun**

The National Museum of Korea (NMK) removed a wall temporarily installed behind the two statues in the second half of 2012 as part of a project to improve the exhibition environment of the Buddhist Sculpture Gallery. It was expected that the removal of the wall would allow space for photographing the inscriptions. Discussions began in early 2012 to determine means to better identify the inscriptions, and the RTI method was chosen. The NMK prepared for the RTI by purchasing the necessary equipment and having Kim Yeongmi, a photographer specializing in museum images and NMK curator Yoon Sangdeok receive training at the University of Southern California West Semitic Research Project. We would like to extend our sincere gratitude to the West Semitic Research Project for helping the NMK lay a foundation for this research.

The first RTI on December 2012 was led by members of the University of Southern California West Semitic Research Project, while the second RTI on September 2013 was conducted by Kim Yeongmi over four occasions. This paper is a revised version of an article presenting the results of the second RTI that was first published in Misul jayo (National Museum Journal of Arts), vol. 84. NMK curator Shin Soyeon contributed the main text on the reexamination of the inscriptions using RTI, and the photographer Kim Yeongmi wrote the appendix on the details of the RTI sessions.

Suematsu Yasukazu argued that the phrase “中宗 神龍元年三月 新羅王金志 賣感恩米來朝,” which can be translated as “On the third month of the first year of the Shenlong era of Emperor Zhongzong of the Tang dynasty (705), Silla king Kim Jiseong dispatched envoys and paid a tribute” in the Cefu Yuangu (冊府元龜, Prime tortoise of the record bureau), vol. 970 is in fact a misdescription of “新羅王新玄金志 賣感恩米來朝,” meaning “the Silla king’s envoy Kim Jiseong came and paid a tribute” (冊府元龜, 卷970, 外臣部, 朝貢3). See Suematsu Yasukazu 1954, 459. For a similar argument, see Kim Yeongmi 1988, 384.

For stylistic features of the Maitreya and Amitabha statues from Gamsansa Temple, see Kim Lena 1989, 206–238.

The unusual style of the Maitreya statue from Gamsansa Temple has also been interpreted in terms of the special interests, faith, and the visual experience of its patron. See Rhi Juhyung 2010, 8–26.


For an interpretation of the creation of these statues of Maitreya and Amitabha in relation to the nature of Buddhist temples pertaining to the Beopsangjong sect, see Moon Myungdae 2003, 72–110. For an opinion refuting a sectarian association, see So Hyunsook 1999, 54–55. For an interpretation of the style and background of the creation of the Maitreya statue in relation to the personal faith and visual experiences of Kim Jiseong, see Rhi Juhyung 2010, 19–20.

For an argument that the Maitreya statue was placed in the main hall (Geumdang) and the Amitabha statue in the lecture hall, see Nakagin Isao 1956, 275–281; Moon Myungdae 2003, 107–109. For an opinion that the two statues were discovered together at the site of the main hall, see Suematsu Yasukazu 1954, 450–460. For the view that the two statues were created and enshrined together, see So Hyunsook 1999, 60–63. For the argument that the two statues must have been enshrined in the same hall because they were made in the same size and style, see Rhi Juhyung 2010, 19.

Suematsu Yasukazu saw it as “六” forming the phrase “歲六十九,” See Suematsu Yasukazu 1954, 454.

For a new translation of the inscriptions based on the findings of the 2013 RTI research, see Kim Yeongmi 2015, 87.

Yang Judoon viewed “攸友” as the hyangchal (攸, a transcription of a Korean word in Chinese characters) for a Korean word meaning “rock” and interpreted the phrase as “scattered around the rocks in the East Sea.” Kang Jonghun refuted Yang’s interpretation because the relevant characters in both inscriptions are 凸凹, which is the name of a place and therefore cannot be understood as the transcription for a rock. See Yang Judoon 1946, 202; Kang Jonghun 2011, 25–27.

The Tomb of King Myureong (武寧王, 501–523) of Baelge (18 BCE–660) provides a case for comparison. It is assumed that after the death of the king, his epitaph and a diagram of the directions of the sexagenary cycle were inscribed respectively on each side of a stone tablet and the title for purchasing the land from the god of the earth was inscribed on one side of another stone tablet. After the death of the queen, her epitaph was inscribed on the other side of the second stone plate, which had been left blank for this purpose. See Gwon Oyeong 2002, 56.

For the view that different characters were used for the same meaning because certain lines of the inscription were added in grammatically incomplete sentences after the death of Kim Jiseong, see Kim Yeongmi 2015, 85.

For studies of the statues from Gamsansa Temple after 2013, see So Hyunsook 2014a, 43–70; 2014b, 39–65; Kim Yeongmi 2015, 73–113.
開元七年己未二月十五日重阿飡金志誠奉為
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千言之道德棄名位而入玄窮硏十七地之法門壞色空而俱滅尋復降
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里後妻阿好里兼庶兄及漢一吉飡一憧薩飡聰敬大舍妹首肹買里及無邊法界一切衆生同出
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彼岸四生六道並證菩提

Inscription on the Amitabha Statue from Gamsansa Temple

Inscription on the Maitreya Statue from Gamsansa Temple
Reexamination of the Inscriptions on the Maitreya and Amitabha Statues from Gamsansa Temple through Reflectance Transformation Imaging

Primary sources


Secondary sources


Appendix

The Reflectance Transformation Imaging and Related Processing Methods Performed on the Inscriptions on the Statues of Maitreya and Amitabha from Gamsansa Temple

Introduction

Reflectance transformation imaging (RTI) was invented by Tom Malzbender, a researcher at Hewlett-Packard Labs.\(^1\) It was performed at the time as polynomial texture mapping (PTR), but has developed into the current method of high-resolution RTI in the fields of cultural heritage and natural history.\(^2\)

RTI is an abbreviation for reflectance transformation imaging. The principle involved is to take advantage of the changes in the reflectance of a surface depending on the incident angle of illumination, which alters the intensity of the reflected light. It is a useful tool for making visible inscriptions on cultural relics that are not easily comprehensible to the naked eye. It detects changes in light and shadow based on 3D virtual light information, which can then be processed by software to allow further research. Furthermore, it is a non-destructive approach and produces data that can be easily accessed by researchers and the public via the Internet.

Configuration for RTI

Image Capture System

In both the Maitreya and Amitabha statues, the epitaph is inscribed across a wide area on the back side of the nimbus and on its two sides. These were divided into 15 frames and captured in the RTI. The images were taken using a digital camera (EOS 5D Mark III, Canon) with a 35-mm full-frame CMOS sensor (36 × 24 mm, 22.3 million pixels) and a 100-mm lens (EF 100 mm F2.8L Macro IS USM, Canon) with an image stabilizer that prevents shift vibration in order to allow sharper image capture. After being fixed on the tripod, the camera was adjusted so that the targeted section of the inscriptions filled the image frame. A gear head (405 Pro Geared Head, Manfrotto) and a laser-guided level (Parallel Alignment Gauge, Versalab) were attached to the tripod to maintain the horizontal and vertical relationship between the inscriptions and the camera (Appendix Fig. 1). This helps with reducing image distortions on the captured inscriptions and matching the focal plane of the center and the edge of the image frame for clearer images.

It is important in RTI to ensure that the distance between the center of the inscriptions to be captured and the lighting source is greater than three times the length of the target inscriptions and to keep this distance constant regardless of the angle of the lighting. Generally, the intensity of the lighting is adjusted so that the exposure is appropriate for an aperture size of F8, which maximizes the sharpness and the resolution of the inscriptions. However, the inscribed surfaces of the statues from Gamsansa Temple are slightly curved, so a deeper focus of F11 was used and the lighting was adjusted accordingly. The live-view mode was applied alongside the manual focus mode to allow a finer focal adjustment.\(^3\) A slow shutter speed in the camera can blur the final image due to minute vibrations during the image capture, even with strobe lighting. Therefore, a fast shutter speed of 1/125 of a second was selected while vibration due to mirror shock was minimized by using the mirror-up function.

RTI produces results by combining multiple digital images
captured by a fixed camera while varying the incident angle of the lighting. To acquire information on the angle and the direction of the lighting for RTIBuilder, a one-inch black ball (shiny ball) was placed on the side of the inscription area to be captured so that it appeared at the side of the captured image. A light-weight portable strobe (Speedlite 600EX-RT, Canon) was synchronized with the camera and used. The angle of the lighting was adjusted to form a virtual hemisphere with respect to the center of the camera frame. It was set to a total of 32 positions with respect to the center of the frame: ±25°, ±45°, ±65°, and ±85° in the vertical direction, ±25°, ±45°, ±65°, and ±85° in the diagonal directions 45° to the left and the right, and 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315° in the horizontal direction. The severely damaged surfaces of the inscription were illuminated from additional lighting positions to provide a maximum of 56 positions. The connection between the camera and the light source was made using a wireless synchronizer (ST-E3-RT, Canon) to facilitate configuration changes and avoid unnecessary physical interruption.

The shutter button on the camera was not used for image capture since this can introduce vibrations in a camera fixed on a tripod and blur the final RTI results after processing via RTIBuilder. Control of the camera and its shutter was performed remotely by software installed on the computer. The file format for the camera was set to RAW rather than JPEG since this format stores more information and enables image processing such as exposure adjustment and white balance (color temperature) control with less deterioration of image quality. The ISO sensitivity was set to 100 in order to maximize image quality. An image calibration card (QP Car 101) was placed in front of the camera and captured as a reference image for white balance (color temperature) control. After removing the image calibration card, images of the inscriptions were taken using various lighting angles.

**Image Processing System**

The digital images captured in the RAW format were collected using image archiving software (Bridge CS6, Adobe) and then processed with image processing software (Camera Raw 7.3, Adobe) to adjust the color temperature, brightness, sharpness,
and any distortion due to the lens. After image adjustment, the areas containing the inscriptions to be deciphered were cropped and saved in the TIFF format (16-bit) and labeled according to the sequence in which they were captured. For calculation using RTIBuilder, the areas of the black ball (shiny ball) were cropped and saved in the JPEG format with their label set according to the capture sequence. Based on the reference images, RTIBuilder successfully calculated the angle of the lighting from the highlights created on the black ball (Appendix Fig. 2). The image files (in TIFF) of the inscriptions were placed in the designated directory of the RTIBuilder database using the script function in Photoshop (Photoshop CS6, Adobe) and then processed to make a final RTI file from the direction of the lighting acquired from the highlight images.

Image Reconstruction System (RTIViewer)

RTIViewer allows the detailed examination of inscriptions from the final RTI files. Researchers can virtually change the angle of the lighting and control the sharpness and contrast by enlarging or shrinking to provide an optimal image of the inscriptions. The final results processed through RTIViewer can be screen-captured and saved in the JPEG format for use in other media.

There are two major versions of RTI viewing software, one from Cultural Heritage Imaging and the other, Inscriptifact Viewer, from the University of Southern California West Semitic Research Project (Appendix Figs. 3 and 4). The former is easy to use by beginners due to its intuitive design, while the latter has the advantage of virtual lighting adjustment. In this study, both were used since the inscriptions were on curved surfaces and the partial damage on the surface was significant. There are many data enhancement options available in RTIViewer, including Diffuse Gain, Specular Enhancement, Image Unsharp Masking, and Dynamic Multi Light. Among these, two options are especially useful for the inscriptions on stone monuments, such as in the case of the statues from Gamsansa Temple. One is Diffuse Gain, which sharpens the image of the inscription by illuminating a single lighting from the side to make details more visible. It improves contrast and sharpness in the inscription images by increasing the reflection on each pixel. The other is Specular Enhancement, which shows the best performance
for inscription deciphering. By virtually adjusting the angle of the lightings, an engraved inscription can be changed to an embossed form to allow a more three-dimensional observation. It is also effective for deciphering to make the surface appear mirror-like by removing the color and stains on the image of the inscribed surface, changing the surface characteristics to a silver-coated surface, and moving the virtual light with a mouse.

Translated by Chung Eunsun