

# On the Early Korean Numerals

## Inscribed on Wooden Tablet no.318\*

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### <Abstract>

A wooden tablet no.318 showing written inscriptions of 38 graphs was excavated from the site of Mireuksa Temple 彌勒寺 in Iksan 益山, Jeonbuk 全北 province. In this research, these 38 graphs have been newly identified and six numerals from the Early Korean language 古代韓國語 have been discovered. These numerals all end with a suffix 邑. Suffix 邑, having originated from the Chinese character 邑, is reconstructed to /\*(u)p/.<sup>1</sup> The

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<sup>1</sup> In this paper, Yale romanization is applied to transcribe linguistic forms of the Korean language, especially both the Middle Korean forms and the reconstructed forms.

set of six numerals in Early Korean has been reconstructed to the following: 何第𪛗/\*hatep/\*하덟 (the first day), 矣毛𪛗/\*itelup/\*이더름 (the second day), 新台𪛗/\*satop/\*사덟 (the third day), 刀士𪛗/\*twosop/\*도습 (the fifth day), 日古𪛗/\*nilkwop/\*닐곱 (the seventh day), 二口𪛗/\*nilkwup/\*닐곱 (the seventh day), 今毛𪛗/\*yetelup/\*여더름 (the eighth day), 以如𪛗/\*yetep/\*여덟 (the eighth day).<sup>2</sup>

The reconstructed forms are then reanalyzed morphologically. It is confirmed that 𪛗 i.e. /\*(u)p/ acts as a suffix that denotes counting in order or serial numbering. The sequence in Gugyeol 口訣 writing of ㄴ + extracted from 以如𪛗 ㄴ + proves that sequences of Gugyeol writings had been in usage by early 8th century at the latest. The reconstructed forms in this paper open up the possibility that vowel harmony had been applied in the Early Korean language, while verifying that the syllable structure CVC had been existent in Early Korean. It is also clear from this analysis that the Sino-Korean syllable-final reconstructed as /\*t/ had changed to /\*l/ before the 8th century, and that the graphs 日 and 二 on this wooden tablet, two members of ńž-initial (日母), were used to represent ń-initial of the early-adopted Go-on (吳音) rather than ž-intial of the late-adopted Kan-on (漢音). The discussion goes on to linguistically determine whether the inscriptions on the wooden tablet are in the language of Baekje 百濟 or Silla 新羅. This paper proves that a descendant of Baekje recorded the inscriptions employing the unique orthography of Baekje language. Overall, conclusions are drawn that the inscriptions on wooden tablet no.318 reflects Baekje language from sometime earlier than the 8th century, which bestows it a philological value equivalent of a national treasure.

**Key words;** Korean numeral, wooden tablet, the Early Korean language, semantic adaptation, phonetic adaptation, the Baekje language, the Silla language.

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<sup>2</sup> With a few exceptions, the phonological representations such as /\*hatep/, /\*twosop/, /\*yetep/ etc. in this paper are based on the Hangeul 한글 transcriptions of Chinese characters in the book *Hunmong jahoe* 訓蒙字會 written by Choe Sejin 崔世珍 in the 16th century.

## 1. Introduction

A wooden tablet (木簡) refers to a pad made of wood that was often used to inscribe writings. Two wooden tablets were excavated from the site of Mireuksa Temple 彌勒寺 in Iksan 益山 of Jeonbuk 全北 province in 1980.<sup>3</sup> On wooden tablet no.319, only two Chinese characters had been written down, whereas on wooden tablet no.318, 38 graphs in total have been found (Gaya National Research Institute of Cultural Heritage 國立伽倻文化財研究所 2004). Not much attention has been given to these tablets until Buyeo National Museum and Gaya National Research Institute of Cultural Heritage 國立夫餘博物館·國立伽倻文化財研究所 (hereafter referred to as Buyeo and Gaya) (2009) provided vivid color photos and infrared photos, since which efforts have been made to identify the strokes and outlines of the written characters.

However, many of the graphs have either been neglected or misinterpreted during the identification process by Buyeo and Gaya (2009). One of the main complexities they faced comes from the obscurity in the visibility of the strokes, as graphs have become fainter over the past 1300 years. Apart from such physical challenges, there were two additional factors that limited clear identification. For one, examples of the Early Korean language including its lexical and grammatical elements had been drafted by borrowing Chinese characters. In addition, linguistic data containing the Early Korean language is so scarce that precise identification proved to be quite difficult.

This paper aims to improve the interpretation of the inscriptions on wooden tablet no.318 by taking on a linguistic point of view and

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<sup>3</sup> See the report of National Research Institute of Cultural Heritage 國立文化財研究所 (1989), and see the list of ancient Korean wooden tablets illustrated in English by Kwon 權仁瀚 (2010).

identifying what has been unidentified or misinterpreted. Through considerable efforts, this research has designated six numerals of 1, 2, 3, 5, 7, and 8 on the wooden tablet that was written sometime in Early Korea. Considering the scarcity value of the Early Korean language, this is a consequential finding for scholars of Korean linguistics. Over the course of this paper, linguistic forms of these numerals will be reconstructed and implications of these reconstructed forms on the diachronic change in the Korean language will be discussed.

## **2. Identification of the Writings**

Wooden tablet no.318 is classified as a typical four-page tablet. Buyeo and Gaya (2009) has clearly and correctly stated which accounts for the first page and which does for the fourth. The following is an excerpt from Buyeo and Gaya (2009:134) for better interpretation of the identification results.



**Figure 1 Wooden Tablet no.318**

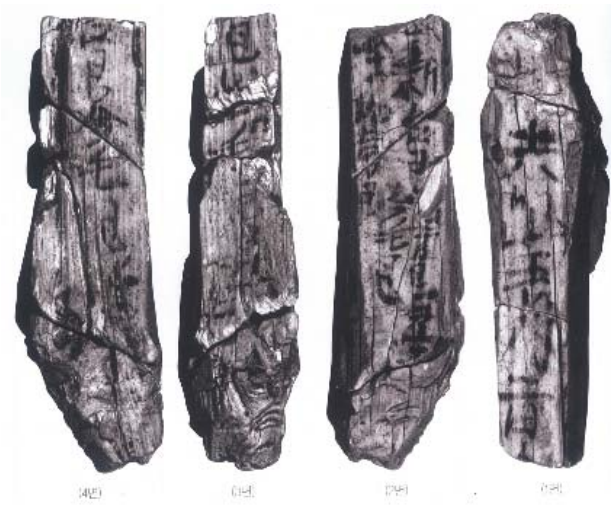


Figure 2 Wooden Tablet no.318

- (1) a. [×□光山五月二日人×] (first page)<sup>4</sup>  
 b. [×新台巳□□巳一雨×] (second page)  
     [×      矣毛巳    ×]  
     [×□□□巳      ×]  
 c. [×巳□□巳      ×] (third page)  
 d. [×□巳今毛巳□  ×] (fourth page)

The mark □ used by Buyeo and Gaya (2009) indicates a graph that could not be identified. In the case of the first page, however, there are no traces of strokes to be found where □ is (see Figure 1, 2). Hence, this paper has replaced □ in (1a) with an underline ‘\_’ to refer to it as blank. When there are some traces of strokes left, □ is replaced with ■. ■ indicates that strokes are visible but unidentified.

It is questionable as to why the third graph in (1a) has been identified as 山 (mountain). Traces of strokes that resemble 丿 appears on the upper-left

<sup>4</sup> The mark ‘×’ in (1) means either the upper or the lower edge was destroyed and perished.

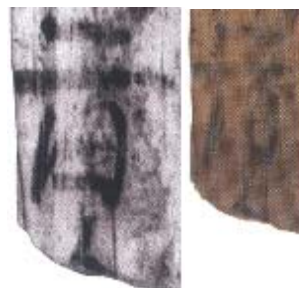
and upper-right side of the graph, indicates that 山 of (1a) should instead be read as 幽. The sequence of graphs 光幽 designates an era or reign name, whereas the sequence of graphs 五月二日 is the date of record.<sup>5</sup> In spite of the partial destruction on the lower parts of the wooden tablet, Buyeo and Gaya (2009) has identified the last graph of (1a) as 人. The intention of such identification seems to be to hint that there would be personal names somewhere on the tablet. However, the last graph should rather be left unidentified, i.e. ■, which will be explained in the course of this discussion. The following is a summary of how (1a) should be revised.



**Figure 3** 光幽



**Figure 4** 五月



**Figure 5** 二日■

(2) a. [×\_光幽五月二日■×] (first page)

As shown in (1), there are three lines of writings on the second page of the tablet. Also, graphs written on the 2nd and 3rd lines are smaller in size than those on the 1st line. This suggests that the 2nd and 3rd lines are in fact supplementary lines. Hence, this paper will focus on the 1st line, putting aside the supplementary parts for the time being.

<sup>5</sup> It had been the norm to write the era name or reign name, date of record, and the name of the recorder (writer) in a document, in order. However, 光幽 is not found in the list of era or reign names. I owe much gratitude to doctor Son Hwanil 孫煥一 for the identification of graph 幽.

It is noticeable that 邑<sup>6</sup> in (1) was used a total of eight times. This demonstrates that the graph 邑 functions as a unit to separate the writing into parts; it is in fact a suffix that is repeated in a series of words. Hence, the first line of the second page can be divided into three parts: 新台邑, □ □邑, and the rest. Once the rest 一雨 is connected to the first graph of the third page, the combination results in the sequence 一雨邑,<sup>7</sup> formed with three graphs and ending with 邑. Under this supposition, notice how the rest of the pages fall through with the same regularity of three graphs that end with 邑. It is easy to see that the 2nd and 3rd lines of the second page are not a part of this overall segmentation based on the graph 邑.

The graph 邑 undoubtedly holds the key to deciphering the writings. Nam 南豐鉉 (2000: 282) has hypothesized that the graph 邑 comes from the Chinese character 包 based on both their graphical resemblance and phonological similarity. For instance, a sequence of graphs 古邑里 (a woman's name) is also written as 古寶里, and the allography between 邑 and 寶 increases the probability that 邑 was also read as /\*pwo/ like 寶, and that 邑 came from the outlines of graph 包 which was also likely read as /\*pwo/. However, there are no examples indicating usage of 包 that can support this argument in traditional Korean orthography. An alternative approach would be that the graph 邑 originated from the lower part of 邑. The graph 邑 had been utilized quite productively in traditional Korean orthography, and had been transcribed consistently as /up/ 읍 as in the Sino-Korean reading system. Regardless of whether the graph 邑 had represented /\*pwo/ from the graph 包 or /\*up/ from the graph 邑, all such alternative approaches result in an increased possibility that graph 邑 would include at least one phoneme /\*p/ within it. It is

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<sup>6</sup> The earliest example of the graph 邑 in usage is of the sequence 異知邑下干支 inscribed on a tombstone at the beginning of the 6th century, located at Bongpyeongri 鳳坪里 of Uljin 蔚珍 in Gyeongbuk 慶北 province.

<sup>7</sup> The sequence 一雨 will be revised to 刀士 in this paper.

important to keep this fact in mind, because this /\*p/ plays a crucial role in deciphering the writings in question.

Returning to the previous discussion on the sequence of graphs 新台巳, it should be noted that the first graph has been correctly identified as 新 by Buyeo and Gaya (2009). 新 is an example of an ancient variant of its Chinese counterpart, and its left part is essentially a vertical combination of two graphs: 立 on the upper side and 末 on the lower (末 has changed to 木 in the present-day). The identification of the second graph 台 by Buyeo and Gaya (2009) is also flawless.



Figure 8 刁士



Figure 7 日古巳



Figure 6 新台巳



The following sequence of graphs □□巳 remains unidentified by Buyeo and Gaya (2009). Taking a close look at the unidentified sequence, however, both the first and second unidentified graphs show signs of strokes that indicate graphs 日 and 古, respectively. The upper part of the first graph 日 has been partly destroyed, but the second graph 古 remains apparent. Buyeo and Gaya (2009) identified the rest of the 1st line of the second page as 一雨. Such identification is a result of the way of



segmentation where one stroke of 一 has been seen as an independent graph<sup>8</sup> and distinguished from its preceding and following graphs. Considering the length and thickness of the previous stroke of the graph 𠂇, however, the stroke of 一 seems to be a portion of the last stroke of the previous graph 𠂇. Applying this other segmentation method, a variant of the graph 刀, or 刁 comes after 𠂇, and graph 士 follows after. The following is a summary of how the 1st line on the second page can be identified with the new segmentation.

(3) [×新台𠂇日古𠂇刀士×] (the 1<sup>st</sup> line of the second page)

As discussed above, the first graph 𠂇 on the third page connects to 士 in (3). The outline of the 2nd graph of the third page seems to indicate 以, but it is no more than a hypothesis in need of better decipherment, for the lower part of the graph is destroyed and illegible. Buyeo and Gaya (2009) also has not been able to identify the 3rd and 4th graphs of the third page. However, these graphs can now be identified as 如 and 𠂇, respectively, with ample reliability.

Buyeo and Gaya (2009) has not mentioned any writings that come after the graph 𠂇. Taking a close look at the third page next to 𠂇, however, there are outlines of strokes that resemble ㄅ and 十, which are Gugyeol graphs 口訣字 that historians and archaeologists may not be familiar with. It is well known to historical linguists in Korea that the sequence ㄅ 十 was productively used in Gugyeol writings to represent the locative case marker ‘-ey/ay’ -에/에 (at, on, in) of the Middle Korean language (中世韓國語). In the following section, it is shown that the sequence ㄅ 十 found on the wooden tablet is actually an example of such locative case marker. The sequence ㄅ 十 in question is by far the earliest

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<sup>8</sup> Buyeo and Gaya (2009) has argued that an independent graph 一 is followed by the graph 雨, however, the graph 雨 is awkwardly identified.

and the most definite sequence of Gugyeol graphs discovered, and to say that this is a significant discovery would not be an exaggeration.

According to Whitman *et al.* (2010), the term Gugyeol is defined by notations or notational systems used for the Korean reading of Chinese texts. However, as argued by Lee 李丞宰 (2007), Jung 鄭在永 (2008) and Kim 金永旭 (2008), some Gugyeol graphs such as ㄹ, ㄱ, and ㅅ were not only used to read texts from China but were also utilized independently to draft documents in Korea. This data shows that sequences of Gugyeol graphs, including the sequence ㄹ ㅅ, were collectively used to construct phrases and sentences in Korean without consulting Chinese texts. Moreover, it is important to note that this sequence of Gugyeol graphs had been written down in the early 8th century at the latest, as discussed further below.

The graph ㅅ is followed by the graph ㄹ. In turn, the graph ㄹ is followed by a graph left unidentified due to the damaged lower part. The following is a summary of the identification of graphs on the third page, with regard to the analysis discussed so far.



Figure 10 ㄹ ㅅ ㄹ ㅅ

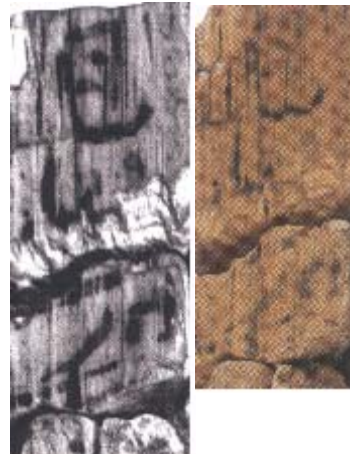


Figure 9 ㄹ ㅅ ㄹ ㅅ

(4) [× ㄹ ㅅ ㄹ ㅅ ×] (third page)

Then, consider the identification of the graphs written on the fourth page. The first graph of the fourth page can simply be identified as the graph 口, but Buyeo and Gaya (2009) have yet to identify it. Identification from the second to fifth graphs has been finished correctly by Buyeo and Gaya (2009). Traces of strokes are left on parts where the sixth through eighth graphs should be, and these also remain unidentified. It is expected that the unidentified parts would be a sequence composed of three graphs, perhaps ending with the graph 巳. The following is a summary of the above discussion.



Figure 13 口口口



Figure 12 今毛巳



Figure 11 口巳

(5) [× 口巳今毛巳口口口×] (fourth page)

The discussion finally turns to the 2nd and 3rd lines of the second page that have been put aside. Since the position of the writings for the 3rd line is at a higher location than that of the 2nd line, it can be assumed that the 3rd line was written first. What is written on the 2nd line has been correctly identified as the sequence 矣毛巳 by Buyeo and Gaya (2009). The first graph is actually quite similar to an example of a Gugyeol graph and Idu 吏讀 graph. It is most certain that the first graph of the 3rd line can be identified as 坐, a variant of the graph 坐 and often used in ancient

times. Although it is difficult to precisely identify the second and third graphs of the 3rd line, the second seems to be of cursive style (草書) of either 何 or 河, and the third graph seems to be an ancient variant of either graph 第 or 婁. Here, the former graphs are chosen in both cases rather than the latter, respectively and tentatively (note question marks). The following is a summary of the above discussion.

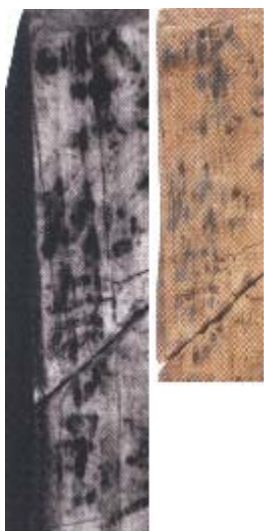


Figure 15 坐何<sup>?</sup>第<sup>?</sup>巳

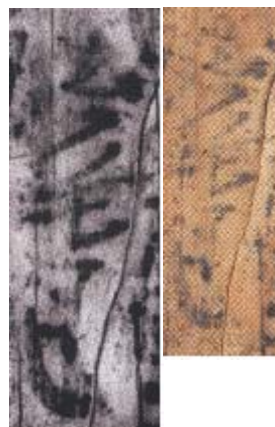


Figure 14 矣毛巳

(6) [× \_\_\_\_\_ 矣毛巳 ×] (the 2<sup>nd</sup> line of the second page)

(7) [× 坐何<sup>?</sup>第<sup>?</sup>巳 \_\_\_\_\_ ×] (the 3<sup>rd</sup> line of the second page)

The following is an end result of the identification of the writings on wooden tablet no.318, rendering all the discussions dealt with so far.

(8) the end result of the identification of the writings

[× \_光幽五月二日\_ ×] (the first page)

[× 新台巳日古巳刀士 ×] (the 1<sup>st</sup> line of the second page)

[× \_\_\_\_\_ 矣毛巳 ×] (the 2<sup>nd</sup> line of the second page)

[×坐何<sup>?</sup>第<sup>?</sup>巳\_\_\_\_×] (the 3<sup>rd</sup> line of the second page)

[×巳<sup>?</sup>以如巳 丿 + 二■×] (the third page)

[×口巳今毛巳■□■×] (the fourth page)

### 3. Decipherment and Reconstruction of the Writings

As discussed above, most of the writings written from the second to the fourth pages are divided by the graph 巳. Only the third page becomes an issue when determining where the point of segmentation is. The sequence of Gugyeol graphs 丿 + generally functions as a locative marker. This implies that the sequence 以如巳 丿 +, as a unit, should be divided from both the previous and following graphs. After writing on the four pages in order, the author must have added the 2nd and 3rd lines on the second page. Hence, the last sequence of graphs on the 1st line of the second page 刀士 should be connected to the first graph 巳 of the third page. The following is an end result of the segmentation illustrated in order.

(9) 新台巳, 日古巳, 刀士巳, 以如巳 丿 +, 二■口巳, 今毛巳, ■□■, 坐何<sup>?</sup>第<sup>?</sup>巳, 矣毛巳.

Since most sequences listed in (9) end with the graph 巳, it is assumed that these comprise a transcription of a series of a word family. As argued above, the graph 巳 has at least one phoneme /\*p/ within it, and /\*p/ has a critical role in deciphering the writings. Utilizing this, for example, the sequence of graphs 日古巳 can be immediately read as the present-day Korean /ilkwop/ 일곱 (七, seven), derived from the Middle Korean /nilkwup/ 닐곱. Hence, it is assumed that the writings illustrated in (9) would be a series of numerals. The following course of discussion will provide validity to this assumption. For historical linguists in Korea, the discovery of a series of numerals written in the early 8th century is an

astounding occurrence. The following is a summary of the numerals in (9), arranged by serial numbers.

(10) Series of Numerals

Usage no.	writings on tablet	age of cow	date	unit in tens	modifier	cardinal
1	坐何第巳 *cwahatep/*좌하덱	금승 kumsung	홀로 holo	열 yelh	흔 hon	흔냥 honah
2	矣毛巳 *itelup/*이더릅	다간 <sup>9</sup> takan	이틀 ithul	스물 sumulh	두 twu	둘 twulh
3	新台巳 *satop/*사톱	사릅 sarup	사올 saol	설흔 syelhun	세/석 sey/sek	셋 seyh
4		나릅 narup	나올 naol	마손 mazon	네/넉 ney/nek	넷 neyh
5	刀士巳 *twosop/*도삽	다삽 tasup	닷썰 tassway	쑤 swuyn	닷/다숫 tas/tasus	다숫 tasus
6		여삽 yesup	옛썰 yessway	여쑤 yeswuyn	옛/여숫 yes/yesus	여숫 yesus
7	日古巳 *nilkwop/*닐곱	일곱 ilkwop	닐웨 nilwey	닐흔 nilhun	닐곱 nilkwup	닐곱 nilkwup
7	二口巳 *nilkwup/*닐곱	일곱 ilkwop	닐웨 nilwey	닐흔 nilhun	닐곱 nilkwup	닐곱 nilkwup
8	今毛巳 *yetelup/*여더릅	여덱 yetep	여드래 <sup>10</sup> yetolay	여든 yetun	여덱 yetulp	여덱 yetulp
8	以如巳 ㄴ + *yetepakoy/*여덱아기	여덱 yetep	여드래 yetolay	여든 yetun	여덱 yetulp	여덱 yetulp
9		아홉 ahwop	아홀래 aholay	아흔 ahon	아홉 ahwop	아홉 ahwop
10		열 yel	열흘 yelhul	온 won	열 yelh	열 yelh

<sup>9</sup> Kim 金星奎 (1984) has already discussed that /takan/ was a loanword from the Mongolian [dayayan], referring to two-year-old horses.

<sup>10</sup> Lee 李基文 (1972) has argued that /여드래/ should be reconstructed to /\*yotolay/, based on the vowel harmony in Middle Korean.

In (10), the ‘age of cow’ in the third column in the first row refers to the numerals used to count how old a cow is in the Jeju 濟州 dialect (Lee 李崇寧 1978). The linguistic forms found from the fourth to the seventh columns are of the Middle Korean form, which is language used in the 15th and 16th centuries. Looking at (10), it is clear that the graph 𐏃 corresponds to the word-final /p/ in many examples, especially with those listed in the column ‘age of cow.’ Thus, it can be concluded that the graph should be reconstructed to /\*p/ \*ㅍ or /\*up/ \*읍. A few exceptions to such correspondence will explain itself in the following discussions.

As discussed above, the graph 𐏃 should represent either /\*pwo/ or /\*(u)p/. However, the correspondence between 𐏃 and the word-final /\*(u)p/ puts on more weight toward /\*(u)p/. Within the tradition of Korean orthography where Chinese characters were utilized, the word-final /\*p/ had been represented by 邑. For example, it is well known that Choe Sejin 崔世珍 transcribed the pronunciation of the Korean alphabet ㅍ /p/ in the sequence of graphs 非邑 /piup/ by utilizing the graph 邑 to represent the syllable-final /p/ in his book titled *Hunmong jahoe* 訓蒙字會. In consideration of this tradition, this paper concludes that the graph 𐏃 in fact originated from the Chinese character 邑.

According to the terminology of Handel (2009), the graph 𐏃 is an example of phonetic adaptation of the Chinese character 邑. Needless to say, the graph 𐏃 illustrated in (10) functions only phonetically and never semantically, and the meaning of 邑 is always disregarded. It is common that Gugyeol graphs are used without consideration for their semantic function, which leads to the conclusion that the graph 𐏃 is an example of a Gugyeol graph, in addition to the fact that it came from the Chinese character 邑 as discussed above. This proposition is based on two grounds. One is that like many other Gugyeol graphs that were made by partially omitting strokes of Chinese characters, this graph was also made by omitting 口 out of 邑. Another is that the outline of strokes that consist

巳 could be substituted by the graph 巳 in ancient times (Kwon 權仁瀚 2007). All in all, it would not be nonsensical to claim that the graph 巳 is a Gugyeol graph in broad terms.

Now the discussion goes on to decipher and reconstruct the writings shown in (10).

Frankly speaking, it was not until the realization that the writings on the wooden tablet are in fact a series of numerals that the sequence of graphs 坐何第巳 could be identified and deciphered, mainly due to the obscurity of the outlines of the strokes. Now, however, it can definitely be interpreted as present-day /chwohalwu/ 초하루 (初一日, the first day of months). In this interpretation, the graph 坐 corresponds to the present-day /chwo/ 초. Strictly speaking, the phonological representation /cwa/ 좌 of the graph 坐 is not accordant with /chwo/ of the graph 初. However, that can be explained by the possibility that the pure Korean form of /\*cwa/ had analogically changed to the Chinese character 初 later on, especially considering the phonological similarity between the two and the strong influence that Chinese words beginning with /chwo/ 初 had. Once an analogical change is presumed, the graph 坐 can undoubtedly be reconstructed to /\*cwa/.

Verification of the graph 坐 is what allows the decipherment of the graphs 何第巳 that follow into present-day /halwu/ 하루 (一日, first day), where outlines of the graphs 何第 remain obscure and quite illegible. Among the words following /cho/ 초 (初) in present-day Korean, /halwu/ 하루 is the most commonplace one. On the other hand, there is a proverb that says “하루 강아지 범 무서운 줄 모른다 (A yearling dog feels no fear in front of tiger)”<sup>11</sup> in Korea. The word /halup/ 하루 referring to ‘a yearling’ in the proverb is a well-known example found that uses /halup/.

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<sup>11</sup> It means “An ignorant person doesn't stand in awe of the great” or “Fools rush in where angels fear to tread.”



This word /halup/ seems to have originated from the sequence 何第巳, having been through phonological adaptation to the graphs 何 /\*ha/ and 第 /\*tyey/, respectively. In fact, the word /halup/ 하릅 is both semantically and phonetically related to the sequence 何第巳. Hence, the sequence 何第巳 is tentatively reconstructed to /\*hatyeyp/ \*하텍. Among what helps refine such reconstruction is the sequences of the graphs 一等 in Hyangga 鄉歌 (Songs of the Country) and 河屯 in *Jilinleishi* 鷄林類事, which are reconstructed to /\*hoton/ and /\*hatwun/, respectively. With that, the reconstructed /\*hatyeyp/ \*하텍 can be revised to /\*hatep/ \*하덍. The present-day /halup/ 하릅 can be naturally derived from the reconstructed /\*hatep/ once the minor rule of /\*t/ > /l/ is applied.<sup>12</sup> On the contrary, /kumsung/ 금승 of the second column in (10.1) is discarded because it has originated from phonetic adaptation of the Chinese word 今生 (to be born this year), as discussed by Kim 金星奎 (1984). Summarizing the above discussion, the sequence 坐何第巳 is reconstructed to /\*cwahatep/ (the first day).

One may be quite surprised when noticing that the sequence 矣毛巳 refers to the present-day /ithul/ 이틀 (二日, second day). To understand the relation between the two, it is imperative to distinguish between the phonetic and semantic adaptation of Chinese characters. The graph 矣 in consideration is an example of phonetic adaptation of the Chinese character 矣, on the contrary, the graph 毛 is an example of semantic adaptation of the Chinese character 毛. The graph 矣 functions as the phonological reading /uy/ 의 of the Chinese character 矣, conversely, the graph 毛 is used semantically as /thel/ 털 (hair, wool) of the Chinese character 毛. In summary, the sequence 矣毛 can be tentatively

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<sup>12</sup> The Middle Korean /palol/ 마를 (海, sea) was derived from the Early Korean /\*patol/ 海等 by the application of the minor rule.

reconstructed to /\*uythel/, resulting in phonological similarity to the present-day /ithul/ 이틀.

It is necessary to take into consideration that there has been no example of /\*uy/ being used as word-initial among pure Korean words, and that examples of aspirated consonants in the Early Korean language are scarce. In fact, the unaspirated /\*t/ is supported by the /t/ of a compound noun /itumhoy/ 이듬해 (翌年, second or next year) from Middle Korean. Therefore, the sequence of graphs 矣毛邑 is reconstructed to /\*itelup/ \*이더릅.

The sequence 新台 in (10.3) is also an example of an aggregate of a semantic adaptation of the Chinese character 新 and a phonetic adaptation of the Chinese character 台. The semantic reading of the graph 新 is /say/ 새 (new) and the phonological reading of the graph 台 is /thoy/ 툰. Thus, the sequence 新台邑 is reconstructed to /\*saytoyp/ or /\*satop/. /\*satop/ \*사듭 (三日, third day) is more desirable than /\*saytoyp/, for many of the off-glide /y/ had been produced later when the diachronic rule /\*a/ > /\*oy/ (\*아 > \*으)<sup>13</sup> was applied to the pronunciations of Sino-Korean graphs. /\*satop/ phonetically resembles /salup/ (three years old) in (10.3). On the other hand, it is still possible to suggest that the graph 新 is an example of phonetic adaptation of the Chinese character, i.e. /sin/. However, this suggestion disregards not only the syllable-final /n/ of the graph 新 but the phonological difference between the vowel /i/ of /sin/ and the vowel /a/ of /salup/ in (10.3). Alternatively, /salup/ is naturally derived from the reconstructed /\*satop/ 사듭 by the application of the minor rule /\*t/ > /l/, mentioned above.

The sequence 刀士邑 in (10.5) is reconstructed to /\*twosop/ \*도습 (五日, fifth day), utilizing the phonetic adaptation of the Chinese

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<sup>13</sup> For example, the phonological representation /noy/ 뇨 of the Chinese character 內 in Middle Korean has derived from /na/ 나 in Early Korean, where 內人 (a court lady) was represented as /nain/ 나인 in Idu 吏讀 readings.

characters 刀 /\*two/ and 士 /\*so/. There is no difference in consonants between the reconstructed and the reflected forms, i.e. /tasup/ 다습, /tassay/ 닷췌, and /tasus/ 다숫, but there is a gap in the first vowel between the two. The difference of the reconstructed vowel /\*wo/ and the reflected /a/ in the first syllable especially raises the question whether the gap can be explained or not. Regardless of the gap, however, it is still worthwhile to note the phonetic adaptation of the graph 刀.

The phonological representation of the reconstructed /\*satop/ 사듭 is quite similar to that of /salup/ (three years old) in (10.3). This suggests that the reconstructed /\*satop/ and /\*twosop/ should designate three-year-old and five-year-old rather than the third day and the fifth day, respectively. Such is also denoted in (10), where it is shown that reconstructed forms most likely correspond to the ages of cows rather than calendar dates in terms of phonological representations. However, not only is the graph 坐 of the sequence 坐何第巳 appropriate for the date of months, but the locative case marker ㅅ + in (10.8) is suffixed only to the date of months as well. Moreover, the suffix transcribed by the graph 巳 /\*(u)p/ was supposedly used more extensively in Early Korean rather than Middle Korean. Therefore, it is undesirable to exclude the possibility that the graph 巳 /\*(u)p/ may be suffixed to the date of months as it does to the age of cows.

Interestingly, the seventh day had been transcribed by both the sequence 日古巳 and the sequence 二■□巳. These sequences are good examples of an allograph in broad terms, as they are synonymous and homophonous. Thus, graph 日 phonetically corresponds to the sequence of graphs 二■, and the graph 古 to the graph □. Actually, phonological difference between /\*kwo/ of graph 古 and /\*kwu/ of graph □ can be deemed minor. In the traditional Korean orthography, a syllable-final /l/ had been transcribed by either 尸 or 乙. If 尸 or 乙 is substituted to the unidentified ■, both 日 and the sequence 二■ have the same phonological

value /\*nil/ 닐. Therefore, the sequences 日古巳 and 二■口巳 can be reconstructed to /\*nilkwop/ 닐꺍 and /\*nilkwup/ 닐꺍 (七日, seventh day), respectively. This remarkable correlation gives credence to the assumption that writings on the wooden tablet are precise and accurate.

This precision and accuracy is again proven by the phonological correspondence between the initial consonant of graph 日 and that of graph 二. In Chinese historical linguistics, all initial consonants of Chinese characters are classified in 36 groups. The so-called *ńź*-initial (日母)<sup>14</sup> is one of the groups, to which only a few Chinese characters are classified. Surprisingly, not only the graph 日 but also the graph 二 simultaneously belong to *ńź*-initial. The writings on the wooden tablet may not have been obscure at all.

In light of historical Korean phonology, it is very important to acknowledge that the /n/ of /\*nilkwup/ 닐꺍 in Middle Korean had originated from the initial consonant /\*ńź/ of both 日 and 二, i.e. two members of the *ńź*-initial. All of the examples of *ńź*-initial that have been introduced so far have consistently reflected the initial consonant /z/ △ in Middle Korean, which is why the example of a diachronic change seen in /\*ńź/ > /n/ has been unheard of. Hence, the sequences 日古巳 and 二■口巳 are enlightening examples supporting the assumption that *ńź*-initial (日母) was existent in the Sino-Korean reading system in Early Korean. In regard to *ńź*-initial of Korean and Japanese, it could be described that the *ń*-initial had been imported before the *ź*-initial. According to such a view where dual (or multiple) processes of formulating Sino-Korean<sup>15</sup> are greatly emphasized, the *ń*-initial in 日 and 二 on this wooden tablet can be depicted as the early-adopted Go-on (吳

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<sup>14</sup> The /\*ńź/ reconstructed by Karlgren (1954) most effectively illustrates the reflected forms both in Korean and Japanese. It is called *Initial jih* 日 in Pulleyblank (1970).

<sup>15</sup> I owe much gratitude to professor Kwon Inhan 權仁瀚 and professor Park Jinho 朴鎮浩 for the useful comments on dual processes of formulating Sino-Korean.

音), whereas the *z*-initial in Middle Korean would be the late-adopted Kan-on (漢音). With this, the reconstructed /\*nilkwup/ and /\*nilkwop/ can be revised to /\*ñilkwup/ and /\*ñilkwop/, respectively.

It has been argued by Lee 李基文 (1963) that there is a close relationship between the Early Korean /\*nanun/ 難隱 (七, seven) and the Early Japanese /\*nana/. /\*nanun/ has been reconstructed based on the allographic correspondence between the sequence 難隱別 and 七重 which were names of a place within the territory of Goguryeo 高句麗. However, the newly reconstructed /\*ñilkwop/ 닐곱 in this paper and /\*nanun/ 難隱 pose a linguistic problem with their discrepancy in phonological representation. Since wooden tablet no.318 has been found within the territory of Baekje, it can be assumed that /\*ñilkwop/ 닐곱 is a phonological representation used in the Baekje 百濟 regions.<sup>16</sup> Thus, it is most likely that /\*nanun/ was a linguistic form of Goguryeo and /\*ñilkwop/ was of Baekje; the former must have been a substratum of the latter.

The sequence of graphs 今毛巳 in (10.8) is reconstructed to /\*yetelup/ (八日, eighth day) based on the semantic adaptation of the graphs 今 and 毛. The semantic adaptation of the graph 今 has been described as /yet/ 연 (now, the present) in *Hunmong jahoe* 訓蒙字會. This /yet/ is also embedded in the derivative word /yethay/ 여태 (till now) in the modern Korean language, which most likely was drawn from a combination of the base /yet/ (今, now) and the locative marker ‘-koy/hoy’ -기/히. As mentioned in (10.2), the semantic adaptation of 毛 has been /thel/ 털 (hair, wool). Hence, the sequence 今毛<sup>17</sup> in (10.8) can be reconstructed to

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<sup>16</sup> It will be discussed below in detail.

<sup>17</sup> Interestingly, the sequence 今毛 had also been used to designate a name of a calligrapher, a name which comes up in the colophon of the copy of Avataṃsaka Sūtra (華嚴經), copied in the 8th century and currently under the collection of Hoam 湖巖 Museum. It seems that the name has its origins in the numeral 8.

/\*yetel/. Once /\*(u)p/ of 巳 is connected to the reconstructed /\*yetel/, the sequence 今毛巳 of (10.8) can consequently be reconstructed as /\*yetelup/ \*여더릅 (八日, 8th day).

Regarding the sequence of graphs 以如巳 ㄹ + in (10.8), however, the question becomes whether the graph 以 could transcribe the diphthong /\*ye/ of the reconstructed /\*yetelup/ or not. There has not been a reported example in traditional Korean orthography where 以 transcribes the word-initial diphthong /\*ye/. In other words, the identification of 以 is yet to be confirmed, although the traces are closest in resemblance to 以. Another possibility is that the graph turns out to identify 亦, which can perfectly transcribe the diphthong /\*ye/, although such assertion lacks potentiality.

On the other hand, it is debatable as to whether 如 can transcribe /\*te/ in the reconstructed form /\*yetep/ \*여덥, regardless of the fact that 如 is clearly identified from the sequence 以如巳. It should be noted that the graph 如 had effectively transcribed the retrospective /-te-/ -더- as in /hoteni/ 헛더니 for representation in Idu 吏讀 writings, and that /-te-/ had its basis on the semantic adaptation of the Chinese character 如 (same). In addition, 如 (same) in Gugyeol had been read semantically in two ways: /ta(ho)-/ 다희- and /kot(ho)-/ 곧ᄃᆞ-. Examples of the former are quite unlikely to come across in most Hangeul 한글 texts published in the 15th century, but the latter seems to have increased in usage as time went by. It is well known that the phonological representation /-te-/ -더- of the retrospective morpheme was based on the very /ta/ of the semantic reading /ta(ho)-/ 다희- (same) of the Chinese character 如. In short, the graph 如 could transcribe both /ta/ and /te/ in the Idu and Gugyeol writings. Utilizing this, it can be reaffirmed that the sequence of graphs 以如巳 should be reconstructed to /\*yetep/ \*여덥.

The above discussions show that /\*yetelup/ reconstructed for 今毛巳 in (10.8) had most often been altered with /\*yetep/ reconstructed for 以如巳

in the Early Korean language. Interestingly, this is parallel to the substitutional relationship that /yetelp/ 여덟 (八, eight) in the current standard Korean has with /yetep/ 여덟 in some Korean dialects. Needless to say, the parallelism provides evidence for support for reconstructions of both /\*yetelup/ and /\*yetep/.

Locating the sequence of graphs ㄹ + among other writings on the wooden tablet has certainly been the most remarkable success. It has already been fully demonstrated by Lee 李丞宰 (2007) that the Gugyeol graph ㄹ originated from the cursive style (草書) of the Chinese character 良. ㄹ is read as /a/ in Gugyeol writings, based on the methods of semantic reading described in *The Thousand Character Classic* (千字文), published in Gwangju 光州 in the 16th century (Lee 李基文 1981b). It has been argued that + originated from the cursive style of the Chinese character 中, and so it has been reconstructed to either /\*koy/ ㄹ or /\*hoy/ ㅎ,<sup>18</sup> with regard to the Hangeul transcription of the Idu 吏讀 writings. Consequently, the sequence of graphs 以如 ㄹ + is reconstructed to /\*yetepakoy/ 여덟아기 or /\*yetepahoy/ 여덟아히.

So far, reconstructions of eight selected sequences in Sino-Korean have been discussed. With the exception of Gugyeol graphs ㄹ + in 以如 ㄹ +, these sequences have a common factor of /\*p/ in their reconstructed forms. This brings about the proposition that the sequence ㄹ + is a type of either a derivative or case marker added to the previous numeral. The following is an actual example of where ㄹ + had been used to represent a locative marker.

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<sup>18</sup> The basis of reconstruction in this case is unclear, although it is assumed that /\*koy/ ㄹ or /\*hoy/ ㅎ was the semantic reading of the Chinese character 中 in Early Korean (Kim 金完鎭 1985).

(11) Examples of the locative marker ㄹ + (*First Translation of Sutra for Humane Kings*, 舊譯仁王經 上 2:11-12)

- a. 釋迦牟尼佛 1 初[ㄷㄹ ㄹ 1] 年 乙、 月 ㄷ 八日 ㄹ + 方 ㄷ 坐[ㄹ ㄷ 下] 十地 ㄹ + 、
- b. 釋迦牟尼佛 1 年 乙 初 ㄷㄹ ㄹ 1 月 ㄷ 八日 ㄹ + 方 ㄷ 十地 ㄹ + 坐 ㄹ ㄷ 下
- c. Śākyamuni Buddha 釋迦牟尼佛, *un* ( 1, topic marker), year 年, *ul* ( 乙, object marker), begin 初 ㄷㄹ, doing (ㄹ 1), month 月, *s* ( ㄷ, possessive marker), 8th day 八日, *akoy* ( ㄹ +, locative marker), the very time (方 ㄷ), Ten Grounds 十地 *akoy* ( ㄹ +, locative marker), sit down 坐, *hosiha* (ㄹ ㄷ 下, honorific and conjunctive form of ‘do’)
- d. Śākyamuni Buddha is sitting down at the Ten Grounds on the 8<sup>th</sup> day of the very beginning month of the year (i.e. on January 8th).

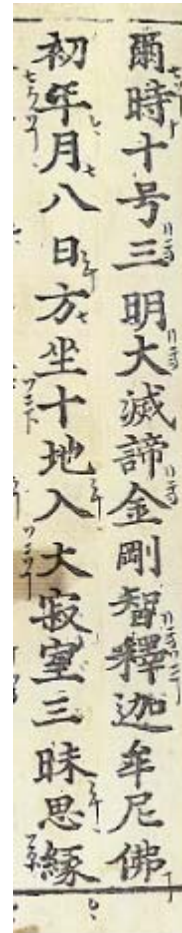


Figure 16 11-12th lines of 2nd page

As the sequences 八日 ㄹ + (on the 8th day) and 十地 ㄹ + (at the Ten Grounds) in (11b) show, ㄹ + functioned as a locative marker in the Gugyeol writings. The locative function of ㄹ + in (11) is consistent with that of ㄹ + in the sequence 以如巳 ㄹ +. It is especially critical to note that /yetolay/ 여득래 (八日, 8th day) in Middle Korean can be analyzed into two parts, one of a base /yetol/ 여들 and another of the locative marker /-ay/ -애, as discussed by Lee 李基文 (1972: 148) and Kim 金星奎 (1984).

According to this analysis, the locative marker /-ay/ -애 in Middle Korean can naturally be driven from /\*akoy/ ㄹ + in the sequence 以如巳 ㄹ + by applying the diachronic /k/-reduction rule. Thus, it is concluded that the sequence 以如巳 ㄹ + is a composite of a numeral and a locative marker. This conclusion leads us to assume that the writings of wooden tablet no.318 should correspond to a series of numerals that do not refer to the age of



cows but to calendar dates, since the latter rather than the former is naturally followed by a locative marker in Korean morphology.

It has been argued above that the sequence 3 + is both the earliest and the most explicit of Gugyeol graphs. Jung 鄭在永 (2008), Kim 金永旭 (2008), and Lee 李丞宰 (2009) have already stated that individual Gugyeol graphs such as 1 /ta/ 다, 2 /ma/ 마, and 7 /tyeng/ 텅 had been used to write on wooden tablets. However, this is the first time that a ‘sequence’ of Gugyeol graphs is found on wooden tablets. In terms of linguistic significance, a sequence of Gugyeol graphs is on a different level in comparison to singular occurrences, for it may hold implications of phrasal or sentential usage of Gugyeol writings that singular occurrences simply cannot. In other words, the linguistic value of the sequence of graphs 3 + in (10.8) should be strictly differentiated from other separate Gugyeol graphs.

#### 4. Linguistic Implications of the Reconstructed Forms

Morphological analysis is essential in discussing diachronic changes of a language and genetic relationships among numerals (Song 宋基中 1984). The reconstructed forms in this paper are not exceptions and should also be analyzed down to parts of components as shown in (12). /\*cwa/ of /\*cwahadep/ and /\*akoy/ of /\*yetepakoy/ are excluded from the illustration, because as noted above, the two morphemes are not examples of numerals.

(12) morphological analysis of the numerals

	date	reconstructed forms	analysis of suffix /*(u)p/	analysis of suffix /*el/	base
a	first day	*hatep	*hate + p : *hat + ep		*hat
b	second day	*itelup	*itelu + p : *itel + up	*it + el + up	*it

c	third day	*satop	*sato + p : *sat + op		*sat
d	fifth day	*twosop	*twoso + p : *twos + op		*twos
e	seventh day	*ńilkwop	*ńilkwo + p : *ńilkw + op		*ńilkw
f	seventh day	*ńilkwup	*ńilkwu + p : *ńilkw + up		*ńilkw
g	eighth day	*yetelup	*yetelu + p : *yetel + up	*yet + el + up	*yet
h	eighth day	*yetep	*yete + p : *yet + ep		*yet

All the reconstructed forms are driven from an aggregate of a base and the suffix */\*(u)p/* as illustrated in (12). Taking *binde vocal* ‘-u/o-’ -으/으- into consideration, whether the underlying form of the suffix is */\*p/* or */\*up/* becomes irrelevant. Rather, what the suffix semantically denotes becomes a foremost issue. To embrace both usages of the suffix, one of counting dates and another of measuring the age of cows in the Jeju dialect, the suffix should mean ‘counting in order or serial numbering.’ It is similar to the suffix ‘-th’ used for ordinal numerals in English, as in ‘fourth’, ‘fifth’, etc.

As discussed in the analysis of numerals in Middle Korean by Lee 李基文 (1972) and Kim 金星奎 (1984), */\*-el-/* in (12b) and (12g) is also extracted from the reconstructed forms. */\*-el-/* may have to be classified as an infix rather than suffix in precise terms, but in this case, it can be described as a suffix attached to a base before the suffix */\*(u)p/* could be consecutively attached. The suffix */\*-el-/* is assumed to correspond to ‘-ul/al-’ extracted from paired words such as */huth-ul-ecita/* 흐트러지다 vs. */huth-ecita/* 흐터지다 (be in disorder, scattered), and */capp-al-acita/* 자빠라지다 vs. */capp-acita/* 자빠지다 (fall down, tumble) in some Korean dialects, as discussed by Lee 李丞宰 (1992). Both the reconstructed */\*-el-/* and the dialectal ‘-ul/al-’ are supposed to have been derived from the same origin ‘\*-ul/ol-’ \*-을/을-, which has been estimated to mean

‘multiple, many times.’ On the other hand, it remains unexplained what the base forms designate.

From a phonological perspective, it is of foremost importance that aside from /\*hatep/ (first) in (12a), all reconstructed forms apply a sense of vowel harmony. As can be seen in the example of /\*satop/ (third) and /\*twosop/ (fifth), if the first vowel of the first syllable is Yang 陽 (i.e. [+retracted]), the vowel of the second syllable is also Yang. Conversely, the Yin 陰 (i.e. [-retracted]) vowel of the first syllable forms harmony with that of the second vowel, as shown in /\*yetelup/ and /\*yetep/. Moreover, the front vowel /\*i/, a neutral vowel, is in harmony with both the Yang and Yin vowels, as shown in the pairs /\*nilkwop/ (seventh) and /\*nilkwup/ (seventh). This leads to the assumption that not much difference had been existent between the vowel harmony of Early Korean and that of Middle Korean.

It has been argued by Choi 崔明玉 (1992) that inflected forms of ‘-a/e’ -아/어 in Hyangga 鄉歌 (Songs of the Country) as well as those in Gyeongbuk 慶北 dialect did not apply vowel harmony. However, as noted by Choi 崔明玉 (1993), vowel harmony within morphemes maintained in usage of Gyeongbuk 慶北 dialects. In terms of its tendency, as also seen in Hyangga, vowel harmony was more consistently applied in derivative words than in inflected words. Such tendencies, along with the relative regularity found in derivative words, bring about confidence in the belief that vowel harmony is in fact applicable in the reconstructed forms. Therefore, this paper assumes that vowel harmony had consistently been applied to the writings on the wooden tablet, reflecting the Baekje 百濟 language.

Some scholars have argued that syllable structure CVC was non-existent in Early Korean, based on findings of names of Korean persons and regional names of Korea that were transcribed with Kata Kana 片假名 in *Nihonshoki* 日本書紀. However, this argument undermines the fact that

Kata Kana is not an appropriate writing system to transcribe syllable-final consonants of the Korean language. In fact, the reconstructed form of the word-final */\*p/* in (12) serves as a compelling evidence against such argument. Moreover, graph 日 of the sequence 日古巳 in (10.7) had undoubtedly been read as */\*ńil/*, containing the syllable-final */\*l/*. In addition, it is clear that the unidentified graph 𐄀 of the sequence 二𐄀口巳 in (10.7) had been written for the purpose of representing the syllable-final */\*l/* of the reconstructed */\*ńilkwup/*. It should also be noticed that graph 毛 of both sequence 矣毛巳 in (10.2) and 今毛巳 in (10.8) had semantically been read */\*thel/* or */\*tel/*, containing the syllable-final */\*l/*. The above examples most definitely repudiate the argument that CVC should be excluded from the syllable structures in Early Korean.

It is well known that the syllable-final */l/* in Sino-Korean had originated from the syllable-final */\*t/* of Chinese characters with the entering tone (入聲), but it remains a question as to when the Chinese */\*t/* changed to the Korean */\*l/*. In this respect, a new light should be shed to the fact that the graph 日 had transcribed as much as the syllable-final */\*l/* of the reconstructed */\*ńilkwop/*. This transcription presupposes that the syllable-final */\*t/* in Sino-Korean had already changed to */\*l/*. The graph 日 in (10.7) seems to be the most explicit and accurate example supporting for the diachronic change */\*t/ > /\*l/*. According to this, the diachronic change began to occur before the 8th century at the latest.

Kono 河野六郎 (1968/1979) and Ito 伊藤智ゆき (2002) claim that the Sino-Korean reading system was developed in the late 8th century and early 10th century, respectively. According to their claims, the Chinese character 日 must have been */\*ńit/* in early 8th century, meaning representation of */\*ńil/* in the reconstructed form of */\*ńilkwop/* would be unfeasible. In other words, the example can only be illustrated on the premise that at least by the beginning of the 8th century the syllable-final */\*t/* shifted to */\*l/*. Whether the phonological change occurred

distinctively in Korea or it had begun already in China is uncertain. However, as Lee 李基文 (1972, 1981a) has stated, the change likely came from Northern Wei (北魏) and was spread in Korea. Traces of the phonological change of /\*t/ > /\*l/ is quite difficult to locate because the Sino-Korean reading system consistently follows /l/.

Now the discussion goes on to determine which language was used in transcribing the numerals on wooden tablet no.318. The first step into this process would be to track in which dialect the phonological sequence similar to that of the reconstructed form can be found. As discussed above, the linguistic form of Jeju dialect is closest to the reconstructed form, with dialects from the areas of Jeonnam 全南, Jeonbuk 全北, Chungnam 忠南 also having high correspondence levels. Hence, the probability that the reconstructed form is from the Baekje language increases, suggesting that the transcriptions on the wooden tablet reflect the Baekje language.

One support for the assertion would be the reconstructed form of /\*itelup/ (second). While the word refers to the numerical 2, it is not as widely known as the sequence of graphs 二盼, 二尸 in Hyangga 鄉歌 or 途亨 in *Jilinleishi* 鷄林類事 that denote the same meaning. Utilizing the latter three sequences to reconstruct numerical 2 in Silla language, one would come up with /\*twupul/. However, /\*twupul/ and /\*itelup/ are much unlike each other. The best way to explain such discrepancy is to acknowledge that the former is in the Silla language and the latter is in the Baekje language.<sup>19</sup> The reconstructed form of /\*twupul/ comes up in the

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<sup>19</sup> Ramstedt (1939: 57) has illustrated some special words for the age of animals (cattle or wild beasts) such as /halwop, halup/ (a yearling), (/twulup, twulwup/ (two years)), /salwop, salup/ (three years old), /nalup/ (four years old), /taswop, tasup/ (five years old), /yesup/ (six years old), /ilkwop/ (seven years old), /yetup/ (eight years old), /aswop, kwulup/ (nine years old), and /tampwul, tamphwul/ (ten years old). In this series of numerals, it is interesting that /twulup, twulwup/ (two years) has derived not from a type of /\*itelup/ but a type of /\*twupul/. This means that

song Cheoyongga 處容歌, which has its background in Gyeongju, capital city of Silla. Since the demise of Baekje in 660 CE, the Silla word /*\*twubul*/ must have been widely used and the Baekje word /*\*itelup*/ must have barely survived in the substratum. One example of such remains would be /*itumhoy*/ 이듬히 (second or next year) mentioned above. Giving consideration to 途亨 in *Jilnleishi* 鷄林類事, such move into substratum seemed to have occurred before the 12th century. In regard to this, transcriptions on wooden tablet no.318 can be said to have records of the Baekje language.

The wooden tablet in question was excavated in the site of Mireuksa Temple in Iksan, Jeonbuk province. In the site of Mireuksa Temple there are two ponds, and this tablet was found in the west pond. Actually, the west pond is supposed to have been built in early Unified Silla (統一新羅).<sup>20</sup> Buyeo and Gaya (2009: 132) has emphasized this point and therefore classified the wooden tablet to be of Unified Silla, not Baekje. Would that automatically affirm that the transcriptions also reflect the Silla language? In consideration of the fact that substitution of language does not occur in such immediate manner, it would be quite logical to assume that Baekje language was still used in the early years of Unified Silla period in the Iksan area. Judging from the style of calligraphy, the transcriptions on the wooden tablet were most likely transcribed toward the end of the 7th century or early 8th century. It is hard to believe that the Baekje language had already disappeared by then. Therefore, the transcription on wooden tablet no.318 is deemed to reflect the Baekje language.

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Hambuk 咸北 dialect described by Ramstedt is more similar to the Silla language than the Baekje language.

<sup>20</sup> National Research Institute of Cultural Heritage 國立文化財研究所 (1989) has developed such assumptions based on the fact that other artifacts excavated from the same pond showed characteristics of early Unified Silla.

One substantial factor in all this is that the Baekje and Silla languages are not that disparate as to require translation. Apart from the numerical 2 i.e. /\*itelup/ mentioned above, most numerals of Baekje are not so distinct from those of Silla's posterities as shown in (10). The numerals used by posterities originate from Silla's numerals, which implies that the numerals in the Baekje language and Silla language do not diverge to that great extent. In reality, the differences come not from the linguistic difference between the two countries but from various dialects. Lee



**Figure 17 Map of the Southern Korea**

李丞宰 (2009) also confirms this by showing the correspondence between the sequence graphs of 毛羅 and 牟羅. Both sequences are reconstructed as /\*mora/,<sup>21</sup> and according to Nam 南豐鉉 (2003) have a meaning of residence under fortification. More importantly, the sequence 毛羅 is on a wooden tablet excavated in Bokamri 伏岩里, Naju 羅州, Jeonnam 全南, and 牟羅 is on a gravestone excavated in Bongpyeongri 鳳坪里, Uljin 蔚珍, Gyeongbuk 慶北. Both the wooden tablet and the gravestone were manufactured before the demise of Baekje, which provides convincing evidence for the argument that language difference between Baekje and Silla was not significant. Based on this finding along with the unanimous numerals, this paper suggests that the Baekje language and the Silla language are of one language with variances in dialects, or the Southern Korean 南方韓國語 as asserted by Lee 李基文 (1972).

<sup>21</sup> Needless to say, it corresponds to /mura/ (村, village, town) in Japanese.

Until now, it has been difficult to locate an example of semantic adaptation within the existing data on the Baekje language. Reasons for that vary from insufficient data to a lack of notational proof that indicates semantic adaptation. Take the sequence of graphs 送鹽二石, found on the wooden tablet no.304 excavated from the temple site of Neungsanri 陵山里, Buyeo 夫餘 of Chungnam 忠南 province for instance. Translated as 'sending two *seoms*<sup>22</sup> of salt,' the characters 鹽 and 石 in this phrase were most likely read semantically, but there is no notational mechanism to prove such. In other words, any rebuttal to an opposing proposition that all four characters should be read phonetically would be based on no grounds. On the contrary, it is definite that the four characters of 毛, 今, 如, 新 found on wooden tablet no.318 were used in the form of semantic adaptation. It is on such grounds that it is suggested that not only in Silla but also in Baekje, methods of semantic adaptation had been used.

What would be the reason behind the fact that twelve of the 16 graphs in (9) show phonetic adaptation whereas the four graphs 毛, 今, 如, 新 show semantic adaptation? Encountering this discrepancy, it is necessary to understand that there is a difference in the syllable structures of Korean and Chinese. A considerable amount of syllables in the Korean language can be notated in phonetic adaptation. However, not all Korean syllables can be notated by phonetically adapting Chinese characters. For instance, it is difficult to notate the Korean syllables of /\*tel/ 毛 (hair), /\*yet/ 今 (now), /\*te/ 如 (same), /\*say/ 新 (new) by phonetic adaptation of Chinese characters. Not only was there an absence of Chinese characters in the 7-8th centuries that reads /\*tel/, /\*yet/, but it is also difficult to find Chinese characters with a similar pronunciation to /\*te/ and /\*say/. In order to notate such syllables unique to the Korean language, one must devise a new notational system. One way to do that would be to adopt a

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<sup>22</sup> A *seom* 섬 in Korean refers to a measurement close to 180 liters.



method where the Korean rendering of a Chinese character would be utilized. According to this method, syllables /\*tel/, /\*yet/, /\*te/, /\*say/ can each be notated as 毛, 今, 如, 新. In other words, methods of semantic adaptation could be developed to notate unique syllables that existed in Korean but not in Chinese (Lee 李丞宰 1989). In the later times, syllables that may well be notated in phonetic adaptation were rather notated in semantic adaptation, which was in large part due to the convenience in interpretation.

There seems to have been a significant difference in the notational system between the Silla and Baekje languages. For example, numerals 1 and 2 were notated in the sequence of graphs 一等 and 二尸 in the Silla language. In fact, the first graph of each numerical would be read semantically and comprehended as a numerical, and the second graph would show that each numerical ends with /\*ton/ and /\*l/, respectively. On the other hand, the Chinese characters of 一 and 二 would not be used semantically even when writing numerals 1 and 2 in Baekje. Such distinctness in orthography brings about complexities in the identification process. If /\*hatep/ and /\*itelup/, which accounts for numerals 1 and 2, were written in the sequence of \*一巳 and \*二毛巳 in the Baekje language, identification would have been straightforward enough so that this research would be deemed unnecessary. Rather, the conclusion here draws a supposition that the orthography of Baekje did not include a first graph indicating the meaning of an entire word.

As noted above, Chinese characters had been adapted both phonetically and semantically in Baekje. Nevertheless, orthography of Silla and Baekje noticeably varies. In Baekje, exact phonological transcription had been of primary focus, which resulted in a distinct application of the two ways of adaptation. On the contrary, understanding of meaning had been stressed in Silla, where methods were applied so that the connecting graphs are interdependent. Kim 金完鎭 (1980) describes this as Hunju

eumjong 訓主音從, i.e. a phenomenon where semantic adaptation dominates and phonetic adaptation follows in course. In the perspective of the modern scholar, Silla's notational system is easier to comprehend and therefore may be more desirable, but the contemporaries may have preferred Baekje's orthography for its clarity where even the first syllable is phonetically transcribed. Regardless, the differences in orthography also suggest that transcriptions on wooden tablet no.318 were transcribed by a descendant of Baekje.

Such dissimilarity in orthography between Baekje and Silla poses another interesting issue in light of its relevance with the orthography in Early Japan. Out of all songs transcribed in Man'yōgana 萬葉假名, Japanese songs and poems published in *Kojiki* 古事記 (712 CE) and *Nihonshoki* 日本書紀 (720 CE) are all recorded in methods of phonetic adaptation. In fact, transcription based primarily on semantic adaptation is not found, and the principle of Hunju eumjong 訓主音從 seems to remain unaccepted. Conversely, semantic adaptation was assiduously utilized when transcribing a large part of the twenty-volumes long *Man'yōshū* 萬葉集 completed in 790 CE, excluding around 6 volumes (parts of volume 5, whole of volumes 14, 15, 17, 18, 20). This hints that they initially took Baekje's orthography and later shifted to Silla's. In other words, they had newly accepted the principle of Hunju eumjong. What clearly supports this supposition is a transcription on a wooden tablet<sup>23</sup> estimated to have been made sometime between 744 and 745 CE.

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<sup>23</sup> It was excavated from the site of Sigarakinomiya 紫香樂宮 in Kōga-shi 甲賀市, Shiga-ken 滋賀縣 of Japan in 1997 and identification was finished in May, 2008. I express my gratitude to professor Kang Inseon 康仁善 for demonstrating the changes in orthography of Man'yōgana along with what was on this particular wooden tablet. The underlined parts in (13c) and (14c) are the traces of writings left on the wooden tablet.

(13) Asakayamano Uta (安積山歌)

- a. asakayama kagesahemiyuru yamanowino
- b. あさかやま かげさへみゆる やまのゐの
- c. 阿佐可夜麻 加氣佐閑美由流 夜真乃井能 (*Man'yōshū* poetry on wooden tablet)
- d. 安積香山 影副所見 山井之 (*Man'yōshū* vol.16 3807, 万葉集 卷 16 3807)

(14) Nanihaduno Uta (難波津の歌)

- a. nanihaduni sakuyakonohana huyugomori
- b. なにはつに さくやこのはな ふゆごもり
- c. 奈迺波ツ尔 佐久夜己能波奈 布由己母理 (*Man'yōshū* poetry on wooden tablet)
- d. 難波津に 咲くやこの花 冬ごもり (Kana Preface in *Kokin Wakashū*)

(13c) and (14c) confirms that up until the mid-8th century in Japan, methods of phonetic adaptation was the dominant and sole method used in transcription of songs. This is similar to orthography in Baekje. However, in the sixteen volumes of *Man'yōshū* 万葉集 edited in 783 CE and in *Kokin Wakashū* 古今和歌集 published in 905 CE, notations change as in (13d) and (14d). This brings about the proposition that Baekje's orthography was abandoned and Silla's was newly adopted. Such proposition concurs with the fact that with the demise of Baekje, its influence in Japan had slowly become languished.<sup>24</sup> The legendary story that Wangin 王仁 of Baekje

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<sup>24</sup> Kiley (1969) observed a similar trend in the names of Kikajin 歸化人 refugees in Japan: they frequently petitioned the emperor to let them replace characters used phonographically in the writing of their family names with characters that could be interpreted logographically. The shift from phonogram to logogram is also observed in the Unified Silla (統一新羅), where king Gyeongdeok (景德王) converted the phonographic notation in the writing of regional names to the logographic notation productively utilizing Chinese characters in mid-8th century.

composed Nanihaduno Uta (難波津の歌) and the historical implication that overall activity of migrants from Silla outperformed that of migrants from Baekje from mid-8th century on add all the more credibility.

Gugyeol has brought about scholarly attention from early on for its similarity in shape and production with Japanese Kata Kana 片假名. Korean scholars have long since supposed that Kata Kana had originated from Gugyeol. In reality, however, scholars could not find a sample of Gugyeol graph that was recorded at an earlier time than Kata Kana's earliest sample of usage, and such theory of origination could not be raised. Recently, Kobayashi 小林芳規 (2003, 2006) has verified graphs impressed with stylus in *Panbiryangron* 判比量論 written by Wonhyo 元曉, and argued that they are Gugyeol graphs that came from Silla. *Panbiryangron* 判比量論 is sealed by Japan's Kōmyō 光明 Kōgō 皇后 (queen) which indicates that the data is of no later than mid-8th century. According to this, usage of Gugyeol in Korea precedes that of Kata Kana in Japan that made an appearance toward the end of 8th century or early 9th century. However, the stylus-impressed writings in question are quite faint and the strokes are almost illegible. Korean scholars have also claimed that the writings are illegible, which reaffirms the dubious features of the data.

On the contrary, the locative case marker ㅅ+ found on wooden tablet no.318 has clearly legible strokes and definite grammatical function. Because of ㅅ+, it can be said that Gugyeol originated in the early 8th century at the latest. Finally, it is proven that the advent of Gugyeol graphs is faster than that of Kata Kana. In addition to the fact that it was about the same time when Seolchong 薛聰 lived.

The story has been handed down that Seolchong 薛聰 'read nine classical texts in the Korean language (以方言讀九經).' To elaborate, he translated the classical texts written in Chinese characters into the Korean language utilizing Gugyeol graphs (Lee 李基文 1981a). Similarly, Japanese Kata Kana was developed when trying to interpret and translate the

Chinese classical texts into Japanese. The locative case marker ㄅ +, as discussed above, was often used in phrases and sentences. If so, the Korean Gugyeol and the Japanese Kata Kana share many similarities from the usage, the strokes and outlines of graphs to the way graphs are produced. ㄅ + on wooden tablet no.318 only seems to be the first example where such similarity is portrayed.

It should be noted that writings in Korean Gugyeol are not entirely based on the premises of Chinese classical texts, as discussed above. Gugyeol was also used independently for recording purposes. Take the graph ㄱ mentioned in Lee 李丞宰 (2009) for example. Known as a Gugyeol graph, ㄱ was also used to transcribe a type of grain, /\*ma/ (薯, dioscorea batatas; scientific name). The graph ㄱ appears in Seongsan Sanseong 城山山城 06-w40, which suggests that Gugyeol graphs appeared as early as mid-6th century. Once these individual cases of usage are taken into consideration, time of origination is estimated to be even earlier.

## 5. Conclusions

There are 38 graphs found to be transcribed on wooden tablet no.318 excavated from the site of Mireuksa Temple in Iksan, Jeonbuk. Buyeo and Gaya (2009) has identified the graphs, but many of them have either been misinterpreted or not identified at all. In this paper, the 38 graphs have been newly identified, which resulted in a new finding of six numerals from Early Korea. With respect to the fact that numerals account for a significant part in Indo-European linguistics, this is undoubtedly a revolutionary finding. The following is the end result of the identification and segmentation, listed in order: 新台邑, 日古邑, 刀士邑, 以如邑 ㄅ +, 二 口邑, 今毛邑, 坐何第邑, 矣毛邑.

It is noticeable that these concurrently end with the graph 𪎩. Not only does this indicate that they are of one word family, but it also hints that the graph 𪎩 holds the key in identifying the writings. 𪎩 is assumed to have come from the Chinese character 𪎩 in this paper, and is reconstructed as /\*(u)p/. Accordingly, the sequence of 日古𪎩 can be read as /ilkwop/ as in the modern language, which brings about the supposition that this chain of word family is in fact a set of numerals from Early Korea. Then, the supposition can be verified by the words that refer to the age of cows in the Jeju dialect, and again by various numerals used in Middle Korean. With this in consideration, the six numerals of the Early Korean language can be identified and reconstructed to be the following. 何第𪎩/\*hatep/\*하덱 (the first day), 矣毛𪎩/\*itelup/\*이더릅 (the second day), 新台𪎩/\*satop/\*사덱 (the third day), 刀士𪎩/\*twosop/\*도습 (the fifth day), 日古𪎩/\*ñilkwop/\*닐곱 (the seventh day), 二𪎩口𪎩/\*ñilkwup/\*닐곱 (the seventh day), 今毛𪎩/\*yetelup/\*여더릅 (the eighth day), 以如𪎩/\*yetep/\*여덱 (the eighth day).

Needless to say, multiple linguistic forms known to be Middle Korean have been utilized in the process of reconstruction, where /halupkangaci/ 하릅강아지 (a yearling of dog), /itumhoy/ 이듬해 (second or next year), /yethay/ 여태 (till now) played critical parts in reconstructing 何第𪎩/\*hatep, 矣毛𪎩/\*itelup, 今毛𪎩/\*yetelup, respectively. It has been a reconfirmation of the fact that old linguistic forms remain in compound words and derivative words like fossils. 7 and 8 are transcribed in two types of sequences of graphs, which is rather a good representation of the modern usage of the language where they are still pronounced in more than two ways in many dialects.

The reconstructed linguistic forms can be put under morphological analysis. The graph 𪎩, or /\*(u)p/, can be compared to ‘-th’ in the English language, and functions as a suffix used when counting orders or expressing serial numbering. This suffix was widely used to count ages of

animals or calendar dates in Early Korea. The sequence ㄹ +, now determined as Gugyeol graphs in the sequence of graphs 以如巳 ㄹ +, especially holds many linguistic implications. It not only proves that the modern word /yetulay/ 여드래 (the eighth day) is a linguistic form where locative case marker is fused but also that sequence of Gugyeol graphs have been in use since the early 8th century at the latest. Not to mention that the term ‘方言’ in the phrase ‘薛聰以方言讀九經’ (Seolchong had read nine classical texts in Korean) specifically refers to Gugyeol. Most importantly, the sequence of Gugyeol graphs is the strongest source of evidence that the Korean Gugyeol graphs were used much earlier on than Japanese Kata Kana 片假名.

The linguistic forms reconstructed in this research have much to offer to the diachronic descriptions in Korean phonology. First, it opens up the possibility that vowel harmony may have been in function in the Early Korean language. Yang vowels (陽母音) /\*o/, /\*wo/, /\*a/ go with Yang vowels, Yin vowels (陰母音) /\*u/, /\*wu/, /\*e/ with Yin vowels, and /\*i/ as one example of neutral vowel that goes with both Yang and Yin vowels. This coincides with the vowel harmony in Middle Korean. Second, it proves that the syllable structure CVC was in existence already in the Early Korean language. The fact that graph 巳 represents word-final /\*(u)p/ and 日 syllable-final /\*l/ verifies that syllable-final consonant was in existence in the Early Korean language. Third, it is before the 8th century when the syllable-final for the character reconstructed as /\*t/ changed into /\*l/. The argument that the Sino-Korean reading system was developed after the 8th century now lacks explanation for how the graph 日 or sequence 二 日 corresponds to /\*nil/ \*닐. Fourth, 日-initial (日母) was existent in the Sino-Korean reading system in Early Korea, and the initial of some characters including 日 and 二 was read as /\*ń/ of Go-on (吳音) rather than as /\*ź/ of Kan-on (漢音).

The fact that wooden tablet no.318 was excavated in the location of Iksan, Jeonbuk indicates that the reconstructed linguistic form in this research is Baekje language. Considering that the west pond in the site of Mireuksa Temple was built in the early period of Unified Silla, however, a linguistic reexamination on whether the transcriptions are of Baekje or Silla language may be necessary. This paper concludes that the transcriptions were written by a descendant of Baekje based on two sets of grounds. First, whereas the numerical 2 is on the line of /\*twupul/ \*두블 in the Silla language, the transcription is reconstructed as /\*itelup/ \*이더릅. The latter has measurable phonological differences with the former, which denotes that it is of Baekje language. Second, Silla's orthography transcribes numerals 1 and 2 as sequence of graphs 一等 and 二尸 or 二盼, respectively. The first graph of each sequence is where semantic adaptation is applied, after which the second graph is added to each sequence with application of phonetic adaptation. In contrast, transcriptions on the wooden tablet did not seem to have semantically adapted Chinese numerals like 一, 二, 三. Such is of vastly different orthography from that of Silla, which implies that it is of unique qualities of Baekje's orthography. Interestingly enough, this orthography is quite similar to the orthography recorded in Man'yōgana 萬葉假名 before mid-8th century in Japan. Based on these two grounds, transcriptions on wooden tablet no.318 are most likely of Baekje language, not Silla.

Many issues have either been neglected or have not been dealt with to its full extent in this research. One of the primary limits of this paper is that the graphs on wooden tablets were interpreted by using the 16th century Sino-Korean reading system represented by Choe Sejin 崔世珍. Also, precise measurement of phonological value in vowels and consonants of the Early Korean language is yet to be implemented. Not to mention the doubtful aspects to the identification process of some graphs. Furthermore, the intent of recording these writings on the wooden tablets has not been



discussed. A prominent assumption is that it would have been recorded as a reminder of a promised date or dates of labor. At the same time, it could just as much be representing amount of grains notated in numbers, collective groups notated in numbers, military secrets coded in numbers, or ancient methods of counting. Limiting to any one of such would be an imaginative assertion based on no grounds. Hence, this paper simply points out that there are numbers recorded, and does not discuss the intent of it. The researcher expects and looks forward to more accurate and in-depth discussions.

One point is absolutely clear, however; regardless of the flaws this research may contain, the transcription on wooden tablet no.318 is of value like any other national treasure with regard to Korean linguistics.

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## Discussion: On the Early Korean Numerals Inscribed on Wooden Tablet no.318

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According to Prof. Lee, he found out six numerals in Early Korean inscribed on Wooden Tablet No. 318 excavated from ancient Bekje area. All those inscriptions end with a suffix 'ㅊ'(/\*(u)p/), and numerals for seven and eight shows two distinct inscriptions respectively. Prof. Lee's discovery is clearly a remarkable achievement in the study of the history of Korean language.

However, since there is no other example of which is here assumed to be inscriptions of numerals, it should be first confirmed that the decipherment is correct. And in this respect, I have a question to be re-examined.

Looking at the picture of wooden tablet, the second page consists of three lines. Prof. Lee read the first line of the second page, and turn over the pages to read the text of the third page. After reading the fourth page, he finally came back to the second page, reading second and third line. He assumed that second and third line of the second page was inserted after the fourth page had been written. But, since, contrary to other pages, the

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first line of the second page is positioned on the right side, it might be more reasonable to think that this unbalance reflects the inscriptor's intention to write all three lines consecutively. How do you think of this interpretation?