Korea's Possible Contribution to the Printing Technology in Europe: A Historical Survey*

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Abstract: The purpose of this article is to examine Korea's possible contribution to the development of metal type printing technology in Europe with a focus on its presumed influence on the printing technology of Johannes Gutenberg (c. 1398–1468), a German regarded as the 'inventor' of this technology in the West. To this end, this research discusses textual evidence and historical circumstances to discern Korea's contribution to this printing technology. Historically, few records indicate Korea's direct contact with Europe. However, scholars more recently began arguing for Korea's possible influence on Gutenberg's metal type technology. Textual evidence and historical circumstances

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** Abbreviations: F.: French; G.: German; J.: Japanese; K.: Korean; L: Latin; S.: Sanskrit.

strongly suggest that Europeans were in direct contact with Koreans in the mid-fourteenth century and, therefore, Korea's contribution to Gutenberg's invention of the metal type printing press. Recent scholarship also proved through experiments that Gutenberg's printing technology was the same as Korea's. As a prerequisite for printing, paper was also transmitted to Europe from the East, and already circulated in Europe before the time of Gutenberg. Premodern Korea was well known to the Chinese for their high-quality paper production. However, these issues still remain for future research.

Introduction

Both in East Asia and Europe, the advancement of a country's printing industry serves as an indicator of development. In ancient China specifically, the invention of printing and paper making were two of its four most celebrated innovations, along with gun powder and the compass.[1] Globally, the invention of the printing press marked the end of the Middle ages and the beginning of the modern era, and printing drove social and revolutionary change through disseminating new information.[2] As a result, the further invention of metal types printing greatly influenced human history and is regarded as one of the greatest achievements of humanity.[3]

The purpose of this article is to examine Korea's possible contribution to the development of metal type printing technology in Europe with a focus on its presumed influence on the printing technology of Johannes Gutenberg (c. 1398–1468), a German regarded as the 'inventor' of this technology in the West. This research will use textual evidence and historical circumstances to discern Korea's contribution to this printing technology.

Korea possesses at least three key items with special meaning in the history of printing: (1) the oldest extant printed material was

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1 Sun, 'Printing', 91.

2 Choi and Kim, 'A Comparative Study', 8.

3 *The Life Millennium*, 166.

found in Korea;[4] (2) the greatest and oldest complete woodblocks among all extant woodblocks in the world are preserved in Korea;[5] and (3) the first use of copper types, which predates Europe by about two hundred years, are from Korea.[6] In particular, the Korean *Sŏn* 禪 (C. *Chan*; J. Zen) text *Paegun hwasang ch'orok pulcho chikchi simch'e yojŏl* 白雲和尙抄錄佛祖直指心體要節 (Master Paegun's Excerpts from Buddhas' and Patriarchs' Directly Pointing to the Essence of Mind, hereafter *Chikchi* (or *Jikji* 直指), which was published in 1377, is known as the oldest existing metal type printing in the world.[8] It was printed seventy-eight years earlier than the *42-line Bible* by Gutenberg and is now on the UNESCO Memory of the World list, preserved in the National Library of France.[9]

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[4] This refers to *Mugu chŏnggwang tae taranī kyŏng* 無垢淨光大多羅尼經 (Pure Brightness Great Dhāraṇī Sūtra) which is presumed to have been published between 701 and 750.

[5] This refers to *Koryŏ taejanggyŏng* 高麗大藏經 or the *Second Korean Buddhist Canon* carved in the thirteenth century, which is extant in Haein Monastery 海印寺 in Korea and is on the UNESCO Memory of the World list. As of 2016, there are thirteen Korean heritage properties listed in the UNESCO Memory of the World Register. For a list and explanation of the Memory of the World, refer to UNESCO. For a concise explanation of world documentary heritages from 1700 BCE to 2011, see UNESCO. For a discussion on raising the international competitiveness through information exchanges, refer to ISMWN. For the scope and structure of UNESCO's Memory of the World program, its project and activities, pilot projects, and cooperation for development, see Torrijos, 'UNESCO's Memory', 120–28.

[6] Chŏn, *Chungguk ŭi chongi*, 488.

[7] This work is also called *Chikchi simch'e yojŏl* 直指心體要節, *Chikchi simch'e* 直指心體, or *Chikchi simgyŏng* 直指心經. In addition, the *Chikchi* is also romanised as *Jikji*.

[8] For an English translation of the *Chikchi*, refer to Reverend Baegun (1299–1375). For a discussion of the intellectual sustainability of the *Chikchi*, see Kim, 'Buddhist Memories'.

[9] Dominique Barjot argues that because today South Korea has sufficient ability to preserve the *Chikchi* properly, it should be returned to its original

Multiple scholars suggested the need for comparative studies on the possible exchanges of printing technology between the East and the West. However, their suggestions are only found in passing phrases and few substantial studies on the subject have been conducted thus far in either Korea[10] or overseas.[11] Recently, scholars began discussing the possible existence of the 'Type Road' and circumstantial evidence which indicates Korea's possible contribution to the development of printing technology in the West.[12] Therefore, this research hopes to contribute to broadening scholarly horizons and provide in-depth research on cultural exchanges between the two hemispheres.

Metal type printing technology[13] was invented for the very first

country, Korea (Barjot, 'Le Jikji', 158 [K.], 172 [F.]). The *Chikchi* was originally composed of two volumes. Until 1613 its original copies existed in Korea (MBC Ch'ungbuk, 'Chikchi rŭl ch'assŭmnida'), but what currently remains is only its second volume. For an English film of the *Chikchi*, see *Chikchi* 2011.

[10] MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'; Ok, 'Koryŏ kŭmsok', 171–204; Park, 'Kodae sagyŏng'. According to them, most of current research on the metal type prints has been limited to bibliographical approaches.

[11] Jørgensen, 'Trends in Japanese Research', 9–25; McBride, 'The Study of Korean Buddhism', 27–48; Mohan, 'Beyond the 'Nation-Protecting' Paradigm', 49–67; Sørensen, 'Trends in the Study of Korean Buddhism', 212–33; Benz, 'Der Beginn', 131 [K.], 143 [G.] When I visited the Needham Research Institute at Cambridge University in the UK in 2014, I was allowed to go through its East Asian History of Science Library. The library housed a unique collection of books and other publications on the history of science, technology, and medicine in East Asia, including quite a number of works on printing. However, there were no works on this topic.

[12] Nam, 'Segye sok', 186.

[13] The printing technology was burst forth by great demand for Buddhist canonical texts (Chŏn, *Chungguk ŭi chongi*, 564). The role of Buddhism should not be ignored in order to understand the invention and development of ancient printmaking. (Sun, 'Printing', 94–95; Xiao, 'The Origin of Book-Printing Culture', 16; Chŏn, *Chungguk ŭi chongi*, 489). In this sense, the Silk Road is also called Buddha Road or Dharma Road, thus closely associated with Buddhism (Han, 'P'yŏnjipcha sŏmun', 2016, 5).

time during premodern Korea.[14] Historical circumstances indicate that Korea's metal type printing technology was probably transmitted to premodern China, then from China to Central Asia, and from Central Asia to Europe,[15] including Germany, the homeland of Gutenberg. As will be examined in the following section, there is enough circumstantial evidence to imply that Gutenberg attained 'his own idea' from Korea.[16]

Textual Evidence

Few historical records indicate that Korea had direct contact with Europe. Furthermore, there has been no record showing the direct relationship between Korea's metal type printing technology and Gutenberg's counterpart. However, pieces of textual evidence illustrating Korea's possible influence on Gutenberg were recently found in Europe: one is an autographed letter by Pope John XXII (1244–1334) and the other is a study on Basel Paper Mill in Switzerland.

1. Pope John XXII's Autograph Letter

There is an endorsed two-page letter by Pope John XXII in parchment in Latin.[17] It is entitled 'Magnifico viro Soco de Chigista, regi Corum, Deum diligere et tiemere' (To the King of the Koryŏ People

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[14] Ch'ŏn, 'The Development Process', 39; Deloignon, 'Un double accident', 103 [K.], 123 [F.]

[15] The scope of 'Central Asia' is not fixed but flexible (Yamaguchi, 'Ilbon ŭi sŏyŏk yŏn'gu', 388).

[16] Hobson, *The East Origins*, 11. For the invention and development of typography in Chinese history, see Zhang, *Zhongguo yinshua shi*, 529–654.

[17] No independent biography of his is in the *Stanford Encyclopedia of Philosophy*. Although his biography is contained in the web, https://en.wikipedia.org/wiki/Pope_John_XXII (retrieved December 25, 2016), there is no mention about his contact with East Asia. However, citing from Thomas Walker Arnold, *The Preaching of Islam*, 200–01, this web information indicates that as an ex-

Who Love and Awe the God) and was preserved covertly in the Vatican Secret Archive in Italy. This letter does not mention topography. However, it demonstrates direct contact between a European, who is thought to have been associated with Gutenberg, and Koreans in the mid-fourteenth century right before the advent of Gutenberg's printing technology. The letter records:

> I celebrate expressions of gratitude to the living God who is the king of the kings and the top of the rulers. This is because Your Majesty [King Ch'ungsuk 忠肅王; 1332–39] has received old and new Catholics to your kingdom with humane kindness and cared for them with warmhearted grace ... If you believe in Jesus Christ, are baptized, keep Christian commandments, and materialize them into action, you will be saved. This is because nobody will be saved without those commandments ... In order to propagate the words of Christ to Your Majesty, the aforementioned country, and its neighboring regions, and to make people follow the orthodox belief in God through repentance and grace we decided to dispatch Nicolaus, who is our respectful brother and Archbishop of Cambia Len, to your kingdom ... When they reached your kingdom, please greet them and ask for your subjects to do the same ... Please believe in our lord Jesus Christ, be baptized, and accept the aforementioned belief. Materialize the belief into action and practice virtue...[18] (Figure 1, Figure 2, Figure 3, Figure 4).

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cellent administrator Pope John XXII had sent a letter of thanks to the Muslim ruler Uzbeg Khan, who was very tolerant of Christians and treated them kindly.

[18] The Korean production team of the documentary movie *Kŭmsok hwalcha ŭi pimil tŭl* 금속활자의 비밀들 (Secrets of Metal Types) directed by Woo Kwanghoon of Aura Pictures, released in 2017 under the name of *Dancing with Jikji* 직지코드, and Segye chonggyo p'yŏnghwa hyŏbŭihoe 세계종교평화협의회 (World Religious Peace Committee) visited the Archives of Vatican in 2015, respectively, and each obtained a copy of the letter there. In October of 2016, I requested a copy of the letter for this research and could obtain it from both of them, for which I appreciate them. Regarding the bibliographical information of

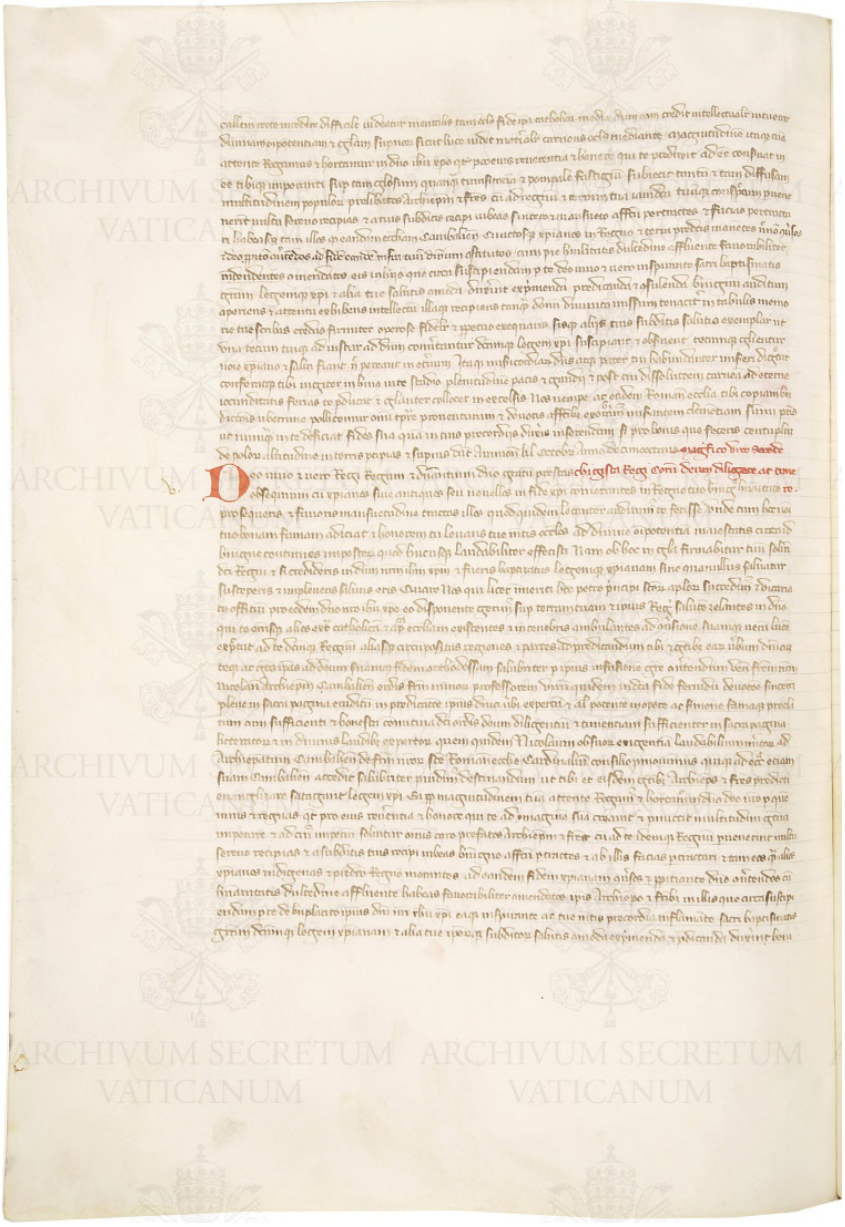

FIG. 1 Pope John XXII's autographed letter, verso. Source: Segye chonggyo p'yŏnghwa hyŏbŭihoe 세계종교평화협의회 (World Religious Peace Committee), 2015.

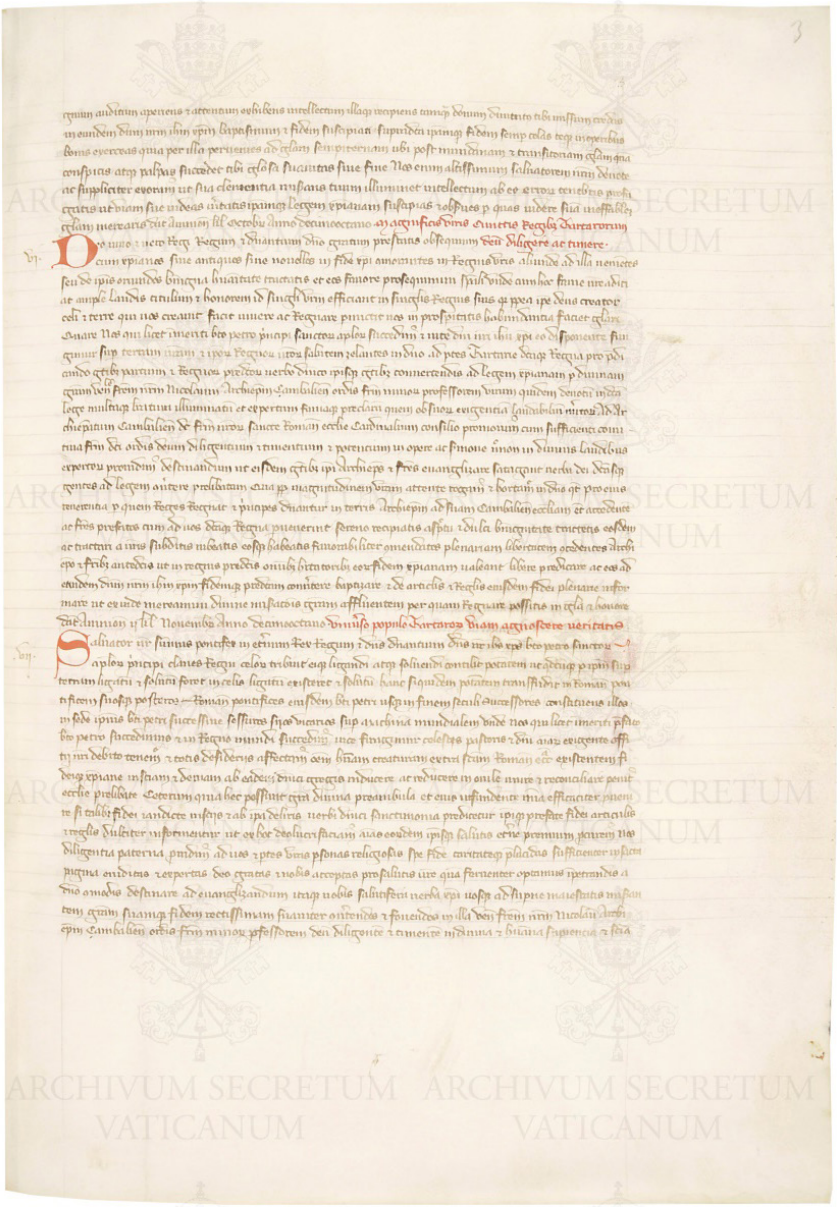

FIG. 2 Pope John XXII's autograph letter, recto. Source: Segye chonggyo p'yŏnghwa hyŏbŭihoe 세계종교평화협의회 (World Religious Peace Committee), 2015.

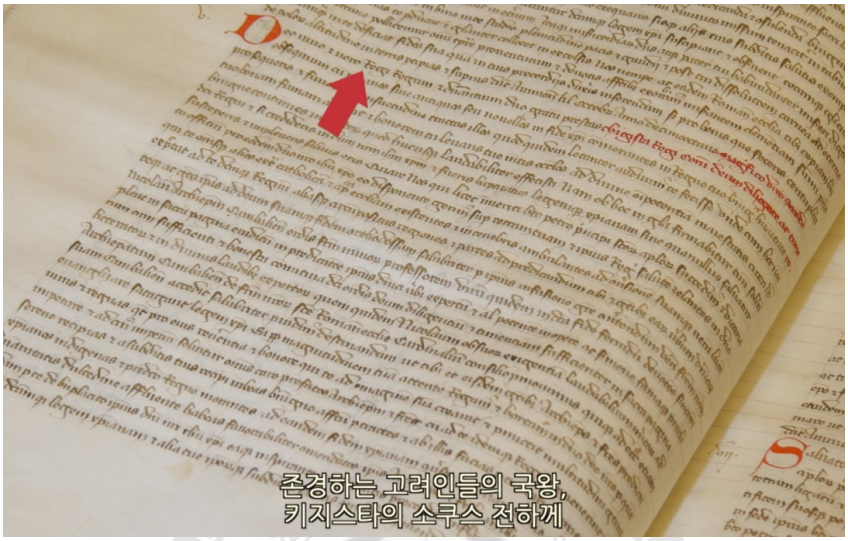

FIG. 3 Passage addressed to King Ch'ungsuk in Pope John XXII's autographed letter, verso. Film still from *Kŭmsok hwalcha ŭi pimil tŭl* 금속활자의 비밀들 (Secrets of Metal Types). Film caption 'Magnifico viro Socho de Chigiota Regi Corum' (To the King of the Koryŏ People Who Love and Awe the God). Source: Aura Pictures, 2015.

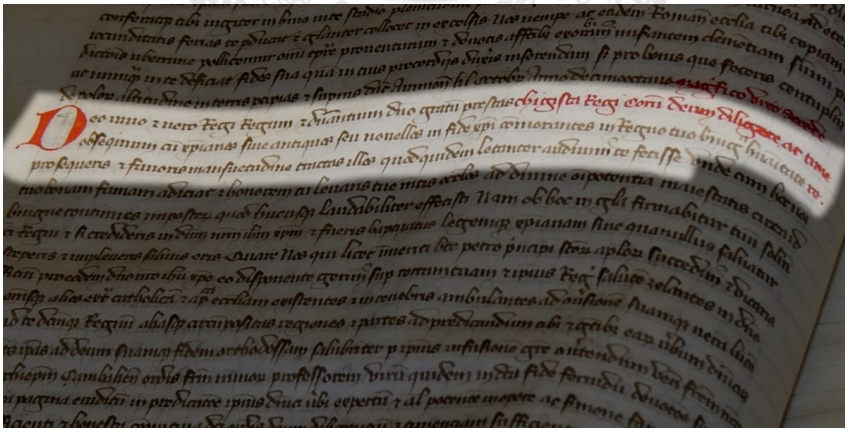

FIG. 4 Highlighted passage of Pope John XXII's autographed letter, verso. Film still from *Kŭmsok hwalcha ŭi pimil tŭl* 금속활자의 비밀들 (Secrets of Metal Types). Source: Aura Pictures, 2015.

According to this letter, the Pope dispatched his delegation to Korea in 1333, forty-four years earlier than the publication of the *Chikchi*, to propagate Christianity to King Ch'ungsuk of the Koryŏ 高麗 (918–1392) kingdom. This action establishes direct contact between Europeans and Koreans in the mid-fourteenth century. Nicolaus, in particular, was responsible for transmitting the letter to King Ch'ungsuk of the Koryŏ kingdom. However, the identity of Nicolaus is unknown.

In this letter, the Pope also sought royal favor to Catholics who were residing in Koryŏ at that time and recommended the king to believe in Christianity. This information is also important for better understanding of the history of Korean Catholicism. The point of departure of Catholicism in Korea is in general known as the mid-sixteenth century.[19] However, this letter indicates that it predated the generally known date by two hundred years.

2. New Research on Basel Paper Mill

In his special address entitled, 'Quo Vadis, Ubiquitous: Charting a New Digital Society,' at the Seoul Digital Forum 2005, citing a Museum of Printing in Basel, Switzerland, Al Gore, USA's former Vice President, stated that Gutenberg's printing technology was obtained after the Pope's delegation visited Korea. Gore spoke:

> Six months ago, I noted a new research at the Museum of Printing in Basel, Switzerland uncovered the fact that was not well-known at least to Western historians. And that is that when Gutenberg invented the printing press, he talked with an emissary from the people who had just returned from Korea with drawings and notes on movable metal type. And this emissary was a personal acquaintance and friend of Gutenberg. So in 1453 when he announced to Europe

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the letter, Director Woo said to me that the Vatican has kept it with no particular title. However, I could gain no further detailed information of the letter from both him and the WRPC due to their reluctance in revealing it.

[19] For a discussion of the relationship between Catholic God and Confucian morality, see Baker, 'Catholic God and Confucian Morality,' 89–118.

> the stunning new invention of the printing process, somehow he neglected to also mention that it had come from Korea.[20]

In this speech, the Museum of Printing in Basel is considered to be Basel Paper Mill.[21] The emissary mentioned as 'a personal acquaintance and friend of Gutenberg' is not specified in this particular speech. However, it is clear Gore was referring to Nicolaus Cusanus (1401–1464) because of another speech he gave in Korea six months prior to the forum. In this previous speech, he identified the emissary as Cusanus.[22] Cusanus, an ecclesiastical reformer, administrator, and cardinal, was arguably the most important German thinker of the fifteenth century.[23]

Therefore, scholars argue that the German cardinal, Nicolaus Cusanus, transmitted Korea's metal type technology to Gutenberg. Their reasoning was based on the three key arguments. First, Cusanus was part of the Pope's delegation to the East from 1438 to 1448, during Korea's golden age of metal types, and he contacted Korea's metal type printing technology. Second, Cusanus was a friend of Gutenberg. A record articulates that Cusanus, as financial personnel of a church in Mainz, sent a letter to Guttenberg in 1430. Third, Cusanus sought massive propagation of the Bible at the same time Gutenberg was look-

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[20] 'Al Gore 2005 Video 2', opening ceremony keynote address, Seoul Digital Forum 2005, May 18, 2005, https://youtu.be/KnUcI-ngW8g, in which he mention of the direct relationship between the metal type technology of Korea and Gutenberg from 4:46 to 5:50 out of 6:05 in running time. I received this web information from the SBS reporter Sim Yŏnggu on December 5, 2016, for which I thank him.

[21] I have emailed Basel Paper Mill at http://www.papiermuseum.ch/en/the-museum to inquire about the new research and to request relevant material. There has been no response as of December 31, 2016.

[22] Cheon1Son, 'Han minjok kŭmsok hwlcha 2/2'.

[23] 'Cusanus, Nicolaus [Nicolas of Cusa],' *Stanford Encyclopedia of Philosophy*. Barend ter Haar at the University of Oxford informed me of this information, for which I thank him. However, in my presentation (Kim, 'Korea's Possible Contribution') section ter Haar strongly denied Nicolaus Cusanus' visit to East Asia and argued that his destination was not beyond Constantinople.

ing for a new business. Therefore, Cusanus transmitted Korea's metal type printing technology to Gutenberg, who then imitated this technology and, at the request of Cusanus, published the *42-line Bible*.[24]

In short, a person with the surname Nicolaus appears both in the Pope's letter and in the project on Basel Paper Mill. However, the two are considered to be different people because of the variance of their dates by several decades. Nicolaus, as the friend of Gutenberg in particular, is regarded as Nicolaus Cusanus. Therefore, the metal type printing technology of Korea that exerted an influence on Gutenberg was probably the technology popular during the reign of King Sejong 世宗 (1418–1450) of Chosŏn 朝鮮 (1392–1910) Korea.[25]

Historical Circumstances

Historical circumstances suggest that Korea's printing technology was transmitted first to China, then further to Central Asia, and eventually to Europe, including Germany. The first date of contact between East Asians and Westerners is uncertain. Some Korean Confucian scholar-officials mentioned this issue. Yi Hangno 李恒老 (1792–1868) claimed there was no relationship between China and Europe in the eleventh century.[26] In addition, in his '*Pal Ch'ŏnju sirŭi*' 跋天主實義 (An Epilogue of the True Doctrine of the Lord of Heaven) in *Sŏngho sasŏl* 星湖僿說 (Literary Miscellany of Sŏngho),[27] Yi Ik 李瀷 (1681–1763) argued that because Europe was 80,000 *ri* 里

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[24] Cheon1Son, 'Han minjok kŭmsok hwlcha 2/2'. Except for Nicolaus, I have no idea of other Europeans who visited Korea around the time of Gutenberg. Father Gregorio de Sespedes, who visited Korea in 1593, has been known to be the first Westerner who visited the country and Hendrick Hamel (1630–1692) stayed in Korea from 1653 to 1666. Therefore, Nicolaus appears to be the first known Western visitor to Korea.

[25] For King Sejong's Buddhist faith and the invention of the Korean alphabet from the historical perspective, see Kim, 'King Sejong's Buddhist Faith', 134–59.

[26] Lee, *Sourcebook II*, 159.

[27] *Sŏngho sasŏl*, 55: 27a–b.

from China,[28] there was no contact between China and Europe until his time.[29] However, Yi's argument is incorrect because other evidence indicates that Europeans visited East Asia much earlier than the time of Yi himself. Evidence demonstrates that the East contacted Europe in the thirteenth to the fourteenth centuries.[30] Marco Polo (ca. 1254–1324) is a prime example. Polo recorded visits to East Asia from 1275 to 1291, thereby proving Yi wrong.

It is unclear how printing technology was transmitted from the East to Europe.[31] However, the transmission of printing technology to Europe was likely similar to the transmission of paper to Europe. Most of the hundreds of prints in Europe were produced from the late fourteenth to the early fifteenth centuries and were similar to Chinese counterparts. This is the most reliable evidence that European printers imitated Chinese books. Things made using this printing technology, including woodcut and typeset books, were distributed in Europe before Gutenberg.[32]

The transmission route is considered to have traveled in two ways: the northern land route and the southern marine route.[33] Between

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[28] Kkaburi t'okki, 'Kwayŏn Chosŏn ŭi illi nŭn myŏt mit'ŏinga?' 까불이 토끼, '과연 조선의 1리(里)는 몇미터인가??' (How many meters was Korea's one li?). 鄕土史 (blog). September 10, 2008, http://blog.daum.net/_blog/BlogTypeView.do?blogid=0H6F2&articleno=4751080, retrieved December 29, 2015). At that time 80,000 *ri* is equivalent to about 54,000 km.

[29] Lee, *Sourcebook II*, 132.

[30] Deloignon, 'Un double accident', 119 [K.], 140 [F.]

[31] Benz, 'Der Beginn', 131 [K.], 143 [G.]

[32] Chŏn, *Chungguk ŭi chongi*, 457–70.

[33] These two routes constitute the Silk Road, which refers to an ancient network of trade routes that for centuries were central to cultural interaction through regions of the Asian continent connecting the East and West from China to the Mediterranean Sea. The Silk Road is divided into three: the Steppe Road, the Oasis Road, and the Marine Road. In the narrow sense, it means the Oasis Road crossing the East and the West of Central Asia (Nagasawa, Siruk rod o shiru jiten, 1, recited from Yamaguchi, 'Ilbon ŭi sŏyŏk yŏn'gu,' 389. The northern route means the Steppe and the Oasis Road while the southern route refers to the Marine Road

the two routes, the northern route was preferred. We are able to deduce this because, aside from cultural exchanges between Ming 明 (1368–1644) China and Chosŏn 朝鮮 (1392–1910) Korea at the end of the fourteenth century when both the land route and the sea route were used, the sea route caused an enormous loss of human and physical resource.[34] Therefore, the northern land route was the more efficient option.

There is evidence that cultural exchanges between the East and the West were established through the Silk Road.[35] Evidence recently found in Iran and other areas also supports the claim that printing technology was transmitted to the West through the Silk Road.[36]

Within this context, historical circumstances suggest that Korea's possible contribution to the development of metal type printing technology in Europe occurred through two routes: One was the route from Koryŏ Korea to Yuan (1206–1368) China, then to Central Asia, and onto Europe (hereafter, Route A); and the other was that from Chosŏn Korea to Ming China, then to Central Asia, and onto Europe (hereafter, Route B). As far as extant records are concerned, between the two, Route B appears to have been related to Gutenberg.

(Kim and Ma, 'Kŭmsok hwalcha', 55–56; Chŏn, Chungguk ŭi chongi, 457.) The concept of Silk Road was first suggested as Seidenstrasse by Ferdinand von Richthofen in 1877 (Hong, 'Chaeid rod', 222). The concept of the Silk Road of today is considerably expanded in comparison with the past and is also understood to include political and economic circles (Han, 'Kodae Sil'kŭ lodŭ', 61). For discussion of the routes network of Silk Roads, see Guo Zhan, 'Silk Roads.' For a thematic study of the Silk Roads, refer to Williams, 'The Silk Roads.' The Marine Road is related to Zheng He 鄭和 (1371–ca.1435), an envoy of Ming China. After the invention of the metal type printing technology in Korea, he went on an expedition to the West by the sea route for seven times from 1405 to 1433. Starting from Nanjing 南京, where Korean envoys visited, his fleet navigated Central Asia, India, Arab, and Africa. Zheng He was also influential from Basra to Bagdad, to Damascus, to Istanbul, and to Venice (MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2').

[34] Kim, 'Yŏmal Sŏnch'o', 273–74.

[35] Benz, 'Der Beginn', 131–32 [K.], 143–44 [G.].

[36] Barjot, 'Le Jikji', 157 [K.], 172 [F.].

1. Propagation of Metal Type in China and Japan

Textual evidence indicates that Korea was the inventor of metal type printing technology, which was promoted further by China and Japan. Bi Sheng 畢昇 (?–1051), who flourished in mid-eleventh century Song (960–1269) China, is said to be the first inventor of typography in the world, predating Gutenberg by 400 years.[37] However, his typography did not employ metal types, but rather used clay types, which were no longer in use. Until 1490 no real evidence of metal type printing is found in China.[38] Marco Polo left his travelogue entitled *Livres des merveilles du monde* (Book of the Marvels of the World, also known as The Travels of Marco Polo, ca. 1300), a book that introduced Central Asia and China to Europeans. However, there is no record of Chinese metal type printing technology. The *Jami'al-tawarikh* [Compendium of Chronicles], published by Rashiad-al-Din (1247–1318) in 1307, is widely considered to be the first world history. This text mentions Chinese wooden printing technology, but does not record any instances of Chinese utilizing metal for printing.[39] The Korean record *Sejong sillok* 世宗實錄 [Veritable Records of King Sejong] of 1435 accords with this, stating that only woodblock prints were used in China at that time. This record also mentions that metal types were used in China in the past.[40] If so, there is a high possibility that the metal types of China before 1435 might have been transmitted from Korea.[41]

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[37] Zhang, *Zhongguo yinshua shi*, 530.

[38] Liu, 'Chungguk hwalcha', 105. Only two metal type characters of Koryŏ are now extant, one at the National Central Museum in South Korea and the other at Kaesŏng Museum in North Korea (Yun, 'The Significance of the Invention', 169).

[39] MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'.

[40] December 13th, 1435, *Sejong sillok* 70 in National Institute of Korean History, *'Chosŏn wangjo sillok'*. For a discussion of the history of the metal type printing technology and its manufacturing process in East Asia, see *'Chikchi wa kŭmsok hwalja ŭi'*, 463–83.

[41] Liu, 'Chungguk hwalcha', 108.

It is said that China succeeded in casting metal types between 1446 and 1566[42] and the first metal type printed book of China was *Jinxiu wanhuaqu* 錦繡萬花曲 [Valley with Gold Embroidered Flowers] in the 1490s.[43] In addition, *Kujin tushu jicheng* 古今圖書集成 [Collection of Ancient and Modern Books] was printed in 1728 and it was the first Chinese metal type printed book by the government.[44]

It is clear that Japan adopted the Korean technology by at least the sixteenth century.[45] Works such as *Tokiyoshi-kyō ki* 時慶卿記 [Record of Lord Tokiyoshi] and *Ken gakumon* 權學文 [Recommendation of Learning] in the sixteenth century indicate that Japan obtained both woodblock and the metal type printing technology from Chosŏn Korea.[46] Although records state that before the Japanese invasion of Korea in 1592, led by Toyotomi Hideyoshi 豊臣秀吉 (1537–1598), Japan already held Korea's metal type printed books, the invasion became a momentum for the Japanese to import the printing technology from Korea.[47] When the Japanese army returned from their Korean invasions, they brought back with them a huge collection of metal types from Korea.[48] Toyotomi presented the copper types to Emperor Goyōjei 後陽成 (1586–1611). By imperial order, *Gobun Gokyō* 古文孝經 [Book of Filial Piety in Ancient Document] was printed in 1593. Subsequently, Sruga 駿河 copper type, the first Japanese metal type, was made in 1606 under the influence of the Korean metal types that reached Japan in 1593.[49] Therefore, it is highly possible that the metal type technology of Korea was transmitted

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[42] Ch'ŏn, 'The Development Process', 38.

[43] MBC Ch'ungbuk, 'Sesang ŭl pakkun 1/2'; Nam, 'Segye sok', 182–84.

[44] MBC Ch'ungbuk, 'Ch'ŏngju Embisi ch'angsa 36 chunyŏn'.

[45] MBC Ch'ungbuk, 'Ch'ŏngju Embisi ch'angsa 36 chunyŏn'; Chŏn, *Chungguk ŭi chongi*, 512–13.

[46] MBC Ch'ungbuk, 'Ch'ŏngju Embisi ch'angsa 36 chunyŏn'.

[47] *'Chikchi wa kŭmsok hwalja ŭi'*, 485–91.

[48] Park, 'Six Perspectives,' 140.

[49] MBC Ch'ungbuk, 'Ch'ŏngju Embisi ch'angsa 36 chunyŏn'.

to China and then beyond in two ways:[50] Route A or Route B, or through a combination of both.

2. Route A

Korea's contact with the West was primarily through China. Although there are no records on mutual technological exchanges concerning metal type between Koryŏ Korea and premodern China,[51] including Song and Yuan, the two countries were active in cultural exchanges and book production.[52] Before the advent of Gutenberg's printing press, the East and the West were also active in cultural exchanges, primarily due to the Yuan Mongol empire's expansion policy to the western region [*sŏyŏk* 西域].[53]

Commercial, diplomatic, and cultural relationships between China and Europe developed between the thirteenth and early fourteenth centuries.[54] During the Mongol period, a wide range of culture spread to the corners of the global community through the

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[50] Liu, 'Chungguk hwalcha', 108.

[51] *'Chikchi wa kŭmsok hwalja ŭi'*, 481. It was in the sixteenth century when the Chinese printing technology appeared apparently in the records of Europe (Chŏn, *Chungguk ŭi chongi*, 472).

[52] While Koryŏ imported quite a number of books from China, Koryŏ also exported books to China during the period of the tenth to the fourteenth centuries (Nam, *Koryŏ sidae*, 689–99). For the exchanges and preservation of records in Korea during that period, see Nam, Koryŏ sidae, 689–701. In particular, for a list of books that Song requested Koryŏ, refer to Nam, *Koryŏ sidae*, 695.

[53] The term 'western region' has been a traditional concept used since the Former Han 前漢 (206 BCE–24 CE) period, but its definition is not clear (Yamaguchi, 'Ilbon ŭi sŏyŏk yŏn'gu,' 387). It means in a broad sense the active ruling area of the central kingdom in each period, referring to the Central Asia to the west of Yangguan 陽關 and Yumenguan 玉門關. In its narrow sense, it in general refers to the east of Pamir Mountains, the west of Dunhuang 敦煌, the south of Altai Mountains, and the north of Mount Kunlun 崑崙. (Wang, 'Han·Tang sigi', 15–16).

[54] Chŏn, *Chungguk ŭi chongi*, 464–65.

Silk Road, which was the most active in human history during this time.[55]

Scholars have argued that China played an important role in the transmission of printing technology. From around 1270, under the control of the Mongol empire, the political and cultural relationship among Koryŏ, China, and Central Asia was stronger than before.[56] Although there is no record with exact evidence concerning it,[57] it is highly probable that the Chinese printing technology, along with Korea's metal type, was transmitted to Europe during the Mongol period.[58] This is especially probable considering the Mongols reached the frontier of Germany in the late thirteenth century.

Korea's connection with western countries has a long history.[59] Premodern Korea had a direct relationship with Arabs. Silla 新羅 (57 BCE–935 CE)[60] Korea had contact with Arab merchants in the eighth century.[61] In the eleventh century people from *Taesik kuk* 大食國, which referred to the Arab Empire, offered presents to the kings of Koryŏ Korea.[62] However, Koryŏ was in the 'intervention period' or 'semi-colonial period'[63] under Yuan dynasty from the late thirteenth to the early fourteenth centuries, which meant Koryŏ only contacted foreigners through Yuan. Chinese scholars argue that when the Mongol army directed toward the West, Chinese printing technology was transmitted to the Arab world via the

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55 Yi, 'Munmyŏng kyoryu', 39.

56 Chŏn, *Chungguk ŭi chongi*, 492.

57 Yi, 'Munmyŏng kyoryu', 38.

58 The trade between China and North Africa in the fourteenth century was very active (Chŏn, *Chungguk ŭi chongi*, 463).

59 Yi, 'Munmyŏng kyoryu', 38.

60 For the English translation of the history of Silla, see Kim, *The Silla Annals*.

61 Lee, *A New History of Korea*, 73.

62 Sahoe Kwahagwŏn Kojŏn Yŏn'gusil and Sinsŏwŏn, *Koryŏ sa* vol. 5, 4a6–7; vol. 6, 22a4–6.

63 Korean scholars term Yuan-era Koryŏ as 'Wŏn kansŏp ki' [Yuan intervention period]. However, Western scholars suggest it as the 'semi-colonial period', for which see Duncan, 'Late Koryŏ Literati', 2.

modern Xinjiang 新疆 area[64] and then onward to the West through the Arabs.[65]

In the palace of the Mongol empire, believers in various religious traditions gathered from all parts of the world and most of them were given preferential treatment.[66] In the early fourteenth century, Korean intellectuals, including monks and Confucian scholar-officials, visited the Yuan kingdom to acquire new knowledge.[67] Man'gwŏndang 萬卷堂 [Hall of Ten Thousand Volumes] was established by King Ch'ungsŏn 忠宣王 (1298–1308) of Koryŏ in Yanjing 燕京 [present-day Beijing], the capital of Yuan, and it was a representative place for their gathering.[68] In 1305, King Ch'ungsŏn also donated Buddhist canonical texts [*changgyŏng* 藏經] to Daqingshou Monastery 大慶壽寺 in Dadu 大都 [present-day Beijing] of Yuan for good fortune to Empress Dowager Yusheng 裕聖, the queen of Shizu 世祖 (1260–1294).[69] Chan monks who belonged to the Linji 臨濟 lineage flourished most at that time and some of them served as masters of Korean monks,[70] including Paegun 白雲, the compiler of the *Chikchi*. Therefore, it is possible to presume that the Koreans in Yuan had contact with Arabs and were able to transmit Korea's printing technology to

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[64] Chŏn, *Chungguk ŭi chongi*, 463.

[65] For the history of the metal type printing technology in the West, see *'Chikchi wa kŭmsok hwalja ŭi'*, 482.

[66] Cho, 'Sipsa segi', 29.

[67] Yi Kok 李穀, 'Song Kim tongnyŏn Tongyang yu sangguk sŏ' 送金同年東陽遊上國序 [Preface to the Travel to the Superior Country of Kim Tongnyŏn, Who is the Same Age with Me], *Kajŏng chip* 稼亭集 [Collection of Kajŏng] 8, 9:a8, in *Han'guk munjip ch'onggan* [Collection of Korean Literary Works] 3, 151.

[68] Cho, 'Sipsa segi', 13.

[69] *Daqingshousi dazhangjing bei* 大慶壽寺大藏經碑 [Epitaph for the Great Canons at Daqingshou Monastery], *Chuguo Wenxiengong Xue Luocheng xiansheng wenji* 楚國文憲公雪樓程先生文集 [Literary Collection of Master Xue Luocheng, Lord Literary Law of the Chu Kingdom], vol. 18, recited from Chang, *Yuandai Lishi ziliao ji*, 131–33.

[70] Cho, 'Sipsa segi', 21–36. For the situation of Korean monks' entry into Yuan in the fourteenth century, see Cho, 'Sipsa segi', 22–24.

them. In that context, Kim Sung-Soo claimed that it is highly possible Arabs came in contact with Korea's metal type printing technology and transmitted it to Arabic states and further to the West.[71]

In addition, Shi Jinbo believes that the active development of the printing technology both in China and in Uighur, which was located in Eastern and Central Asia and acted as a strategic point of the Silk Road, was followed by the rise of the Mongol empire. Uighur people during the period of the Mongol's conquer also played a significant role in the transmission of the printing technology to the West.[72] After the Mongolian army conquered Turfan, a great number of Uighur people were transferred to the Mongolian army, Uighur scholars became advisors to Mongolian emperor, and Uighur culture became the foundation of Mongolian power.[73] At that time, cultural exchanges between China and the West were very active.[74] Typesetting printing first emerged in Germany right after the high period of the Mongol's conquest of the West.[75] Therefore, Korea's metal type printing technology might have been transmitted through Yuan to Central Asia and then to Europe. This circumstantial evidence indicates that the Mongol's conquer of Europe contributed to the invention of print types in Europe.[76] In short, a possible route for the transmission of Korea's metal type printing technology is considered from Koryŏ Korea to Yuan China, then to Central Asia, including Uighur, and finally to Europe, including Germany.

3. Route B

As far as the metal type printing technology is concerned, Korea was its inventor and China and Japan were second movers. The

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71 MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'.

72 Chŏn, *Chungguk ŭi chongi*, 461.

73 The earliest example of books by typography so far discovered was printed in the Xi Xia 西夏 period (1032–1227) (Sun, 'Printing', 100).

74 MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'.

75 Chŏn, *Chungguk ŭi chongi*, 464.

76 Chŏn, 457–58.

mid-fourteenth century in particular saw the golden age of Korea's metal type printing technology. The trade routes between Chosŏn Korea and Ming China were open wide and the two countries had a close relationship. Koreans most likely contacted Chinese, Arabs, and Europeans through the route from Chosŏn to Ming, then to the Timurid empire (1370–1507), an Arabic country that dominated the Silk Road of the Central Asia, comprising modern-day Iran, to Novgorod in Russia, and to Mainz in Germany.[77]

Jin (1115–1234) shared borders with Koryŏ and had a close relationship with Yuan. In this context, Jin dispatched envoys to Timurid, which stretched into Baghdad in the fifteenth century. At that time, the Jin dynasty was in decline and paid a tribute to the Timurid empire through envoys to secure power.[78] Arabs (*Hoehoe in* 回回人) visited Chosŏn during its early period and continued to visit Korea at least until the seventeenth century. In order to observe courtesy, they participated in the coronation ceremony of King Sejong, during whose reign Korea's metal type printing technology was at its peak.[79] A path between Korea and the Timurid empire and Europe was also wide open through the Silk Road and cultural exchanges between the two worlds were very active.[80] Korea's metal types were probably transmitted to the Timurid empire through Jurchen, a Tungusic people who established the Jin dynasty and inhabited the region of Manchuria until around 1630.

Chinese people at the time were also associated with Russians. Koreans contacted Samarkand (Uzbekistan), a midpoint of the Silk Road between China and the West, through the Jurchen and the Chinese. In his travelogue entitled, *Misón diplomática de Castilla a Samarcanda* (1403–1406), Clavijo, an envoy for a Spanish king, said,

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[77] The Mongol army seized the Silk Road which led from Xi'an of China to Dunhuang and to Samarkand (MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2').

[78] MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'.

[79] September 27, 1418, *Sejong sillok* 1 in National Institute of Korean History, *'Chosŏn wangjo sillok'*.

[80] Yi, 'Munmyŏng kyoryu', 40–41.

> In 1404 there came to Samarkand a caravan of 800 camels from China with silk, gems, musk and rhubarb ... Samarkand in the time of the Timurid empire was the center of a far-reaching networks of routes, and envoys from a tribe living apparently in eastern Siberia brought falcons, sables and marten-skins to Timur, ...[81]

In the early fifteenth century, Russian merchants engaged in trade with the East. They were also connected with Chinese, Arabs, and Europeans who traveled the Steppe Road. It is also said:

> At that time, the city of Novgorod,[82] which was located in the upper part of River Volga, was the center of the trade between the East and the West. Russian merchants came to Samarkand along River Volga. In Novgorod there was also a storehouse for goods and a plaza for trade for German merchants. Russian merchants and merchants from the East came to this plaza to purchase German goods.[83]

Gonzalez de Mendoza (1545–1618), who authored a work regarded as the most comprehensive and authoritative about China in 1585, also proclaimed that Gutenberg was influenced by the printed matters of China that were transmitted via Russia.[84]

In addition, Kim Kuji said that Jurchen visited Chosŏn 1,098 times from the fourteenth to the seventeenth centuries; and, in particular, they visited Chosŏn 349 times during the reign of King Sejong,[85] the golden era of Korea's metal types, which strongly suggests their contact with Korean metal types.

In short, this historical evidence proposes Korea's influence on the development of the metal type printing in East Asia and beyond,

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81 MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'.

82 Novgorod was one of the most important historic cities in Russia. At its peak during the fourteenth century, the city was the capital of the Novgorod Republic and one of Europe's largest cities.

83 MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'.

84 Chŏn, *Chungguk ŭi chongi*, 475–76.

85 MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'.

including Germany. This chain ran from Chosŏn Korea, to the capital of Ming China and Jurchen Jin, to Central Asia, including Baghdad of the Timurid empire, then onward to Russian cities such as Novgorod and Samarkand, and to the urban areas of Europe, embracing the Rhine and Mainz, where Gutenberg 'invented' his metal types.

4. Printing Technology in Europe

Printing in the Western world began centuries later than in Asia. The art of printing in Europe was inspired by Chinese prints brought back by merchants and other travelers.[86] The Roman missionary John of Monte Corvino (1246–1328) is a good example. He was dispatched to China by the Catholic Pope and lived there for more than thirty years. He and his colleagues worked in Beijing, Fujian, and Yangzhou 揚州, built cathedrals, and drew pictures to propagate Christian doctrines. If paintings that printed Buddhist contents on them were popular around this time, it is likely that the missionaries copied this tactic to spread images of the Bible.[87]

Before the invention of metal movable type, copying technology was already being used in medieval Europe[88] and a variety of printings must have existed more than one century earlier than Gutenberg.[89] It is also speculated that printing technology in the West was invented by the Rhine.[90] Gutenberg challenged the invention of the metal type printing technology in Strasbourg, printed his metal type prints in Mainz, and then visited Frankfurt to sell his prints. These three places related to Gutenberg were all located adjacent to the Rhine.[91] In particular, Frankfurt from the 1200s was a very famous city for exhibition and a great number of Asian goods were displayed

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[86] Sun, 'Printing', 103.

[87] Chŏn, *Chungguk ŭi chongi*, 464–66.

[88] Choi and Kim, 'A Comparative Study', 10.

[89] Chŏn, *Chungguk ŭi chongi*, 466.

[90] Audin, *Histoire de l'imprimerie* (1972), 31, recited from Choi and Kim, 'A Comparative Study', 8.

[91] MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'.

there. Gutenberg also participated in an exhibition held there with his *42-line Bible*.[92] The use of movable metal type in Europe even lagged behind the Kabinja 甲寅字 copper type cast in Korea in 1434.[93] Therefore, it is presumed that Gutenberg's invention of metal type was a product of the situation in which he lived, including Korea's possible influence.[94]

A New Interpretation

Gutenberg was known as the first person to use this particular printing technology.[95] However, his position as the inventor has been challenged recently. Over time, scholars tended to regard Gutenberg as more of an imitator than inventor.[96] This is due to the increased attention paid to the possible contact between the East and the West with regard to the metal type printing technology. The scholars' views can be classified into two groups: those who view China as the inventor of the technology and those who see Korea as the inventor. While the former view neglected cultural exchanges between the East and the West around the time of Gutenberg, the latter is gaining more strength. In addition, a closer examination of the issues of conventional scholarship of the subject matter, the technological identity of Gutenberg, the situation of

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92 MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'.

93 Ch'ŏn, 'The Development of Process', 39.

94 Yi, 'Munmyŏng kyoryu', 41.

95 Audin, *Histoire de l'imprimerie* (1972), 31, recited from Choi and Kim, 'A Comparative Study', 8; Benz, 'Der Beginn', 133 [K.]; Choi and Kim, 'A Comparative Study', 19; Cheon1Son, 'Han minjok kŭmsok hwlcha 2/2'; Kim and Ma, 'Kŭmsok hwalcha', 39; Nam, 'Segye sok', 186; MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'; Yi, 'Munmyŏng kyoryu', 4; Zhang, *Zhungguk yinshua shi*, 529.

96 Benz, 'Der Beginn', 133 [K.]; Cheon1Son, 'Han minjok kŭmsok hwlcha 1/2'.; MBC Ch'ungbuk, 'Ch'ŏngju Embisi ch'angsa 36 chunyŏn'; Hobson, *The East Origins*, 183; Hudson 1961, 169–68 [*sic*.], recited from Nam, 'Segye sok', 186); *The Life Millennium*, 166; and Jean-Noël Robert (Kim, 'Buddhist Memories'.)

the trade route, and the lapse of time between the two hemispheres also supports Korea's possible role in the transmission of the metal type printing technology to Gutenberg.

1. Scholarly Views

While some scholars argued the exclusive role of premodern China in the transmission of the metal type printing technology to Europe, other scholars are increasingly emphasizing the role of premodern Korea in it.

Shi Jinbo argued that China invented the metal type printing technology for the first time in the world,[97] however, his argument provided no solid textual evidence. Mendoza claimed, 'The Chinese proved that the point of departure of the printing technology was China... I can conclude that they were transmitted by land routes... Gutenberg took these books as the original of his printing technology.' Mendoza's arguments exerted a significant influence on scholars in later times and they argued in common that Gutenberg invented his printing technology in that context.[98] Robert Curzon (1810–1873) stated that the similarity of the books printed by typeset in China and Europe was probably because European travelers to China imitated ancient Chinese books that they brought to Europe with them.[99] Thomas Francis Carter (1882–1925) advocated indirect diffusion: first, paper-making in China diffused westward,[100] which was a necessary prerequisite for printing; second, a series of printed products diffused to Europe, including playing cards, paper money, image prints, and Chinese books; and third, knowledge of

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[97] MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'.

[98] Chŏn, *Chungguk ŭi chongi*, 476–77.

[99] Chŏn, 470–71.

[100] The invention of paper in China has been traditionally credited to Cai Lun (蔡倫, 51?–121?). However, since the discovery in 2006 of the earliest piece of paper in Gansu Province 甘肅省 inscribed with a map which dates from 179–41 BCE, it is now believed that Cai refined rather than invented the technology (Yi, 'Documentary Traditions', 307).

the actual method of typography could have been reported by any one of the numerous European who sojourned in China.[101] However, as far as the metal type printing technology is concerned, more scholars are arguing for the role of premodern Korea in its transmission to the West.

In contrast, John H. Hobson (1858–1940) maintained,

> It must be asked whether it was just a pure coincidence that Gutenberg happened to hit upon his printing press, the general outlines of which had already been discovered in mid-eleventh century China, and the specific outlines of which had been invented in Korea some fifty years earlier.[102]

G. F. Hudson contended:

> The metal type printing of Chosŏn Korea made great strides before its counterpart emerged in Europe. In addition, there must have been the transmission routes of information between East Asia and Germany. Therefore, those who argue that the printing technology of Europe developed completely independently should take responsibility of proving their theories.[103]

Bruno Blasselle furthered this argument, 'It is not clear whether Korea's metal type printing technology exerted an influence in Europe. However, nobody can deny that Korea invented it 200 years earlier than Europe'.[104]

In brief, with the lapse of time, more scholars tended to emphasize Korea's role in the development of Gutenberg's metal type printing technology. Until the early twentieth century, scholars stressed the role of China in the history of metal type printing in Europe. However, Korea was not mentioned yet. From the mid-twentieth century

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[101] Hobson, *The East Origins*, 185.

[102] Hobson, 185.

[103] Hudson, 168, recited from Chŏn, *Chungguk ŭi chongi*, 479.

[104] MBC Ch'ungbuk, 'Ch'ŏngju Embisi ch'angsa 36 chunyŏn'.

Korea appeared as the cynosure of scholarly attention regarding its role in printing history. This trend seems to be the mainstream for current academic circles.

2. Gutenberg as an Imitator

During the first century before Gutenberg printed the Latin Bible *Vulgata*, Europe had numerous social developments which made invention of printing inevitable.[105] By observing the historical situation of Europe in the fifteenth century, it is clear that a variety of technologies to transcribe books, such as woodblock printings or metal type printings, were attempted. At least two people, Prokop Waldvogel and Gutenberg, had conducted research on the development of the printing technology that used movable types. It is certain that Waldvogel made an effort to fulfill a similar goal to Gutenberg, who began printing books around 1440. This could indicate that there were multiple inventors simultaneously interested in information from the East during this time and they individually experimented with the new ideas. Furthermore, the technology of printing engraved in the metal in Europe was already developed in Strasbourg and Constance around 1440.[106]

Therefore, Blasselle claimed that Gutenberg began the technology belatedly. There is a high possibility that the Korean technology reached the West through travelers or religious figures who visited the East.'[107] Paul Needham and Blaise Aguera y Arcas suggested two hypotheses. The first hypothesis is the possible existence of the 'Type Road.' They argued that Korea's metal type printing technology was transmitted to the West and Gutenberg copied the metal type technology of Korea. The second hypothesis is related to the time of the invention of the metal type printing technology. They said that it was almost impossible for Gutenberg to invent the technology in such a short time frame, speculated somewhere be-

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[105] Choi and Kim, 'A Comparative Study', 18.

[106] Deloignon, 'Un double accident', 105 [K.], 126 [F.]

[107] MBC Ch'ungbuk, 'Ch'ŏngju Embisi ch'angsa 36 chunyŏn'.

tween ten years[108] or ten to fifteen years,[109] without being influenced by Korea.[110] In addition, as Benz maintained,[111] when Gutenberg invented the printing technology, the method to print texts using movable types was not a new technology at all. During my recent lecture at Nagoya University in Japan (Kim, 'Buddhist Memories'), Jean-Noël Robert also mentioned that Gutenberg was no longer accepted as the inventor of the metal type printing technology in the West and is now being considered as simply having succeeded in using the technology which already spread in Europe at that time. I agree with those who view Gutenberg as an imitator and disagree with those who see him as the inventor.

3. Renewal of the Trade Route

Carter argued that because the trade route between the East and the West was severed, the possibility of the transmission of the metal type printing technology of Chosŏn Korea was rare.[112] Benz also said that in 1368 contact between the two sides was disconnected. According to Benz, this was because the founder of the Ming prohibited contact or trade with foreign countries. This suggests that Gutenberg did not contact the printing technology of the East when he was alive.[113] However, their arguments need to be corrected. Although the Ming prohibited the use of the land route in 1373,

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[108] It is said that Gutenberg invented the printing technology during the period of around ten years (MBC Ch'ungbuk, 'Sesang ŭl pakkun 1/2').

[109] Benz argued that Gutenberg completed the technology over ten to fifteen years (MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'). In contrast, it took three years for a copy of the Bible to be transcribed on parchments before Gutenberg invented metallic type. However, Gutenberg printed 180 copies of the Bible thanks to his metal type printing press. It was a revolution in publishing (Cheon1Son, 'Han minjok kŭmsok hwlcha 1/2').

[110] Cheon1Son, 'Han minjok kŭmsok hwlcha 1/2'.

[111] Benz, 'Der Beginn', 131–33 [K.], 143–45 [G.].

[112] Yi, 'Munmyŏng kyoryu', 41.

[113] Benz, 'Der Beginn', 133 [K.], 144 [G.].

thereby only allowing the sea route, it re-opened the land route around 1384.[114]

4. No Problem with the Elapse of Time

In his *The Invention of Printing in China*, Carter argued that there is a one-hundred-year gap between the closing of the trade routes in 1368 and the invention of metal type in Europe in 1455.[115] A question then arises: if the Chinese metal type printing press was transmitted to the West, why did it not emerge in Europe for 100 years?[116]

These issues can be responded to in two ways: first, from the perspective of the speed of cultural transmission or close contact between the East and the West; and second, from the period of cultural transmission between the two sides. The eighth to the ninth centuries were 'the cultural age of contemporaneous fashion,' which means that the transport period of high-value commodities of trade, both by the land and the sea routes, among global metropolitan cities, including Kyŏngju 慶州, the capital of Silla Korea, Changan 長安, that of Tang 唐 (618–907) China, Baghdad, that of the Islamic empire, and Constantinople, that of the Byzantine empire (ca. 330–1453), was sixth to eight months.[117] Although Korea invented metal type printing technology in the twelfth century, its transmission to China and Japan took about 300 years and 400 years, respectively. Therefore, this one-hundred-year gap between the East and the West does not deny the possible relationship between Korea and Gutenberg.

In short, as far as the transmission of the metal type printing technology is concerned, Korea comes to the fore. Gutenberg's printing press was not a result of a new technology, but rather that of his situation influenced by the East because of the openness of trade between the East and the West. The time gap of cultural exchanges

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[114] Lee, '1386 nyŏn', 34–35.

[115] MBC Ch'ungbuk, 'Sesang ŭl pakkun 2/2'.

[116] MBC Ch'ungbuk.

[117] Yi, 'Munmyŏng kyoryu', 38–39.

between the two sides does not guarantee Gutenberg's independent invention of metal types. As a result, it is highly possible that Gutenberg's movable metal type technology was influenced by Chosŏn Korea.[118] There is still a possibility that Koryŏ Korea's metal type printing technology was transmitted to Europe. However, it is more probable that the technology of fourteenth-century Chosŏn Korea, when the metal type printing technology was at its peak in Korean history, is what exerted an influence on Gutenberg.

Conclusion

The purpose of this paper was to examine Korea's possible contribution to the development of Gutenberg's metal type printing technology. To this end, this research discussed the textual evidence and historical circumstances of the subject matter. Historically, few records indicated Korea's direct contact with Europe. However, scholars more recently began arguing for Korea's possible influence on Gutenberg's metal type technology. Evidence, such as the Pope John XXII's endorsed letter in the Vatican Secret Archive and the project of Basel Paper Mill, clarify the direct contact of Europeans with Koreans in the mid-fourteenth century and, therefore, Korea's influence on Gutenberg. Around the time Gutenberg was active, the cultural exchanges between the East and the West were dynamic, following the expansion of the Mongol empire to the West primarily through the Silk Road. Korea had close ties with Yuan and subsequently Ming, where Koreans contacted Europeans. Chinese and Arabs, who played a significant role as mediators between the East and the West, also visited Korea during the peak of metal type printing technology in the mid-fourteenth century. Around that time, Gutenberg embarked on inventing his printing technology. These textual evidences and historical circumstances strongly suggest Korea's contribution to Gutenberg's invention of the metal type printing press. Since printing is a media which allows for the propagation of ideologies through

[118] Yi, 'Munmyŏng kyoryu', 39.

books, an examination of the comparative history of ideologies must accompany the comparison of Korean and German technologies.[119] Recent scholarship proved through experiments that Gutenberg's printing technology was the same as Korea's.[120] In addition, as a prerequisite for printing, paper was transmitted to Europe from the East, and already circulated in Europe before the time of Gutenberg.[121] In particular, Gutenberg's Bible was printed in paper made in Italy, which was influenced by the East.[122] Premodern Korea was well known to the Chinese for their high-quality paper production. Therefore, this technological evidence also suggests a great possibility of Korea's influence on Gutenberg. However, these issues still remain for future research.

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