

Gutenberg and the Koreans

Did East Asian Printing Traditions Influence the European Renaissance?

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Left: Jost Amman, *The Printer's Workshop*, from the *Book of Trades*, woodcut, 1568.
Right: Qing dynasty illustration of a small print workshop (*Ying Chih Wen Thu Chu*).

Johannes Gutenberg's development, in mid fifteenth-century Mainz, of printing with movable metal type was enormously consequential—it made texts available to an increasing percentage of the population and helped to spark the European Renaissance.¹ So it is surprising how much remains unknown about Gutenberg and his invention, such as its year of creation, what the press looked like, what tools were used to prepare the type, or what financial structure supported the print operation.

Another question also remains unanswered: Was Gutenberg aware that he was far from the first to print with movable metal type, and that printing in this manner had been done in Asia since the early thirteenth century? "The question if there was a direct influence from the orient on the invention of printing with movable type in Germany around 1440," says Eva Hanebutt-Benz of the Gutenberg Museum in Mainz, "cannot be solved so far in the context of the scholarly research."² What is certain, however, is that that printing with movable wooden type is documented from the eleventh century; that printing with movable metal type had been an active enterprise in Korea since 1234; that other printing technologies had Asian origins and were subsequently transmitted to the West; that a single empire (the Mongol khanates) stretched from Korea to Europe through much of the thirteenth and fourteenth centuries, facilitating cross-cultural exchange across a large region; that there was considerable East-West travel, contact, and exchange during this period; that the written record of such contacts records only a fraction of what actually occurred; and that there was awareness of Asian printing in Europe in the centuries before Gutenberg.

For all these reasons it is likely that Europe's print revolution did not occur independently but was influenced or inspired by similar printing in Asia.



Passport (paiza) enabling travel through the Mongol empire. (Metropolitan Museum of Art).

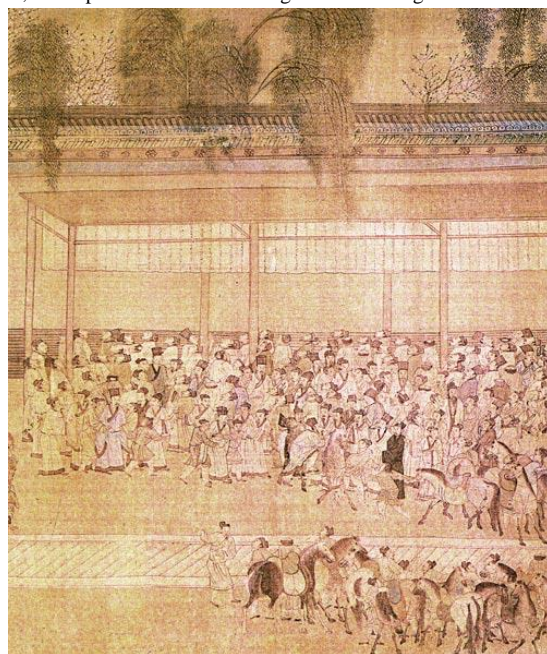
Gutenberg is rightly lauded for his resourcefulness, inventiveness, and skill, but the impact of printing was more a manifestation of social change than of a single technological innovation. Print technology fueled or accelerated social developments, but at the same time it was as a response to them. Moreover, print technology is a complex system of interactions rather than just a single machine — it involves technologies of paper-making, ink production, metal-casting, distribution, and so on. These technologies differed between East and West, in part because of the materials available, so movable-type printing differed as well.³

What is printing for? Printing is above all a duplicating process, and Gutenberg was the Xerox of his time.⁴ Printing does not directly produce knowledge, it facilitates the spread of existing knowledge. Therefore, the first requirement for the development of printing is a demand for texts and for duplication of documents. In Gutenberg's Europe such demand was exploding, and printing responded to this existing market — demand for books was so great in the mid-fifteenth century that a single bookseller might employ 500 scribes; by the end of the century there were 150 printing presses in Venice alone, and nearly 15 million books had been printed. The happy result for many publishers was a dynamic in which increasing supply fed increasing demand.

But there is another, perhaps less evident, function of printing. This is standardization. To generalize, the duplicative function was given more weight in the West and the standardizing function more weight in East Asia. The reason for this lies in the different social contexts of printing in the two areas. In the West, early Renaissance printing had a subversive tinge—in the Italianate states where it first caught hold in a major way it was associated with capitalist enterprise that tended to undercut the authority of church and nobility by creating new sources of wealth and by extending publications beyond the inner circles of the traditional literate elite.⁵



Korea (Bibliothèque Nationale de Paris; *Koreana* 7, no. 2, 20-21).



Pages from the *Selected Teachings of Buddhist Sages and Son Masters (Pulcho Chikchi Simch'e Yoyol)*, the earliest extant book printed with movable metal type, dated 1377, Hungdok-sa Temple,

In East Asia, and especially in Korea, where printing with movable metal type was perfected, the situation was different. During the period when this process was regularly used, Korea was governed by the Goryeo dynasty, which had made Buddhism a state religion. In the face of a looming Mongol threat, Goryeo scriptoria were charged with making copies of the Buddhist canon (called the Tripitaka) in order to preserve the Buddhist dharma. (This was a large project

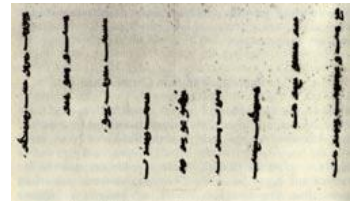
— the first Korean woodblock printing of the Tripitaka, from about 1014, consisted of 5,058 chapters, and later editions substantially enlarged the total. This required more than 130,000 blocks, for which a special storehouse had to be built.) But copyists sometimes imposed, whether intentionally or accidentally, differences in rendering the texts. Since the documents represented Buddhist scriptural orthodoxy it was important for doctrinal reasons that they be standardized. Movable type may have been seen as contributing to such standardization by codifying the character set and enabling multiple documents to be produced from the same set of materials rather than being assigned to different carvers.

Scholars waiting for the results of the civil service exam to be posted. Handscroll attributed to Qiu Ling (active 1530–1552) (National Palace Museum, Taiwan).

The Chinese-style civil service examination system, which was exported to Korea at least by the time of the unification of its states in the seventh century, also contributed to a demand for standardization. A national institute for higher education was established, and private schools existed in various parts of the country to prepare students for the state-run exams. When a provincial school complained about the unreliability of texts, the government ordered copies of books made and delivered to the provincial capital.⁶ Thus in East Asia, both for reasons of state and reasons of religion, printing was not subversive but state-mandated, and its primary motivation was as much standardization as duplication.

The Mongol empire spread knowledge of printing. Chinese book production was described in detail by one of the most important chroniclers of the Mongol period, the Persian official Rashid al-Din, in his early fourteenth-century history. According to Rashid, “when any book was desired, a copy was made by a skillful calligrapher on tablets and carefully corrected by proof-readers whose names were inscribed on the back of the tablets. The letters were then cut out by expert engravers, and all pages of the books consecutively numbered. When completed, the tablets were placed in sealed bags to be kept by reliable persons, and if anyone wanted a copy of the book, he paid the charges fixed by the government. The tablets were then taken out of the bags and imposed on leaves of paper to obtain the printed sheets as desired. In this way, alterations could not be made and documents could be faithfully transmitted.”⁷ Rashid’s report confirms that control of texts was a primary motivation for Chinese printing. It also establishes beyond any doubt that detailed knowledge of woodblock printing was transmitted across the Mongol empire from East Asia to West Asia. It is likely that information about cast-type printing would have been similarly conveyed.

From a letter from the Il-khan Arghun to Philip the Fair of France, in Uighur script, dated 1289.



The Persian Ilkhanate (one of the four states of the Mongol empire) was at this time in regular contact not just with East Asia but also with Europe (in part because the Persian and the European states shared a common enemy in the Mamluk Sultanate), frequently exchanging emissaries and documents.

Indeed, Rashid himself gives a full account of the arrival of the embassy with which Marco Polo reported returning from China.⁸ Rashid also demonstrated the Ilkhanate’s interest in Europe by writing a *History of the Franks*, which reveals a fair understanding of Western Europe, considering that “the Muslims regarded Europe as a remote and barbarous area, hardly worth the attention of a civilized man.”⁹

Popes (left) and emperors (right), from Rashid al-Din, History of the Franks, ca. 1307.

In the face of such evidence it seems more likely that news of Asian innovations in printing reached Europe, and the record of that news has been lost to us, than that no hint of these highly developed technologies traveled the well-worn routes of

land and sea.

The Development of Printing in China, and Its Transmission to the West

Before looking more closely at movable-type printing in Korea, we need to review the development of printing in China. Since early print technologies arose in Asia and traveled from there to the West, it seems a reasonable surmise, in the absence of evidence otherwise, that this process continued as printing developed.¹⁰

Paper

The earliest writing in China was usually on wood or bamboo; silk was also used. The invention of paper is attributed to Cai Lun, a Hunan official of the Han dynasty, in the year 105. Archeologists have, however, discovered examples of paper dating from before the common era; there are also literary references to paper predating Cai Lun. Cai Lun’s paper was made from silk rags, but many different fibers (notably bark and hemp) were later used.

Paper technology may have arisen from the process of felting. It seems logical that printing as a means of creating repeating patterns on textiles was a forerunner to printing on paper. “Whether European textile printing was influenced by the Chinese is not clear,” according to Tsien Tsuen-Hsueh, “but some patterns of Chinese origin, borrowed by Persian weavers, are said to have been transmitted to Western Europe, and certainly many Chinese decorative motifs had been successfully copied by European makers of figured fabrics before 1500.”¹¹ Stamps similar to those for printing textiles were also used by the Chinese for seals and religious charms from an early date.

By the Tang dynasty (618–907) papers of the highest quality were being produced and sent to the capital as tribute. The paper industry was an enabling factor in the Chinese style of centralized government, with its bureaucracy making huge demands for paper. Annual tax assessments alone required more than half a million sheets (each about 12 by 18 inches) a year.¹²

Like other print-related technologies, paper making was gradually transmitted from China to other regions. Paper making spread throughout Central Asia by the end of the fourth century and to Korea apparently somewhat later. By the end of the eighth century paper was being produced in Baghdad. Although it reached Europe by the eleventh century, its use was still spotty at the time of Gutenberg, who printed some of his bibles on parchment (an expensive process, requiring the skins of 300 sheep for a single bible).



In later dynastic China Cai Lun was assimilated into the popular pantheon as the patron deity of papermaking.

Cai Lun as the patron saint of paper making, ca. 18th century

Currency



Block with image reversed for printing, for a Mongol-period bank note, 1264–1340.

Printed paper currency was developed in China in the eleventh century, in part to compensate for a shortage of copper coin in Szechwan, where the printing industry flourished.¹³ The Mongol emperor Khubilai Khan had a sophisticated understanding of paper currency. Rather than invalidate the existing Sung currency—which would have devastated the Chinese economy—he allowed it, for a period of ten years, to be converted to a new currency that he standardized throughout his empire. “To facilitate trade and to promote the welfare of the merchants, Khubilai initiated the use of paper currency throughout his domains,” notes Morris Rossabi, adding that “Khubilai was the first Mongol ruler to seek a countrywide system of paper currency.”



(Kupferstichkabinett, Dresden).

The earliest existing European report of paper currency is a mention from 1255 by William Ruysbroeck, a French missionary to the Mongol court.¹⁴ The accounts of Marco Polo include a detailed description of the Chinese currency, which was briefly adopted by the Persian Ilkhanate. The Persian version was clearly based on the Chinese model, for it was called by the Chinese word *chao*, and it even included words printed in Chinese.¹⁵ In the case of paper currency, as in other aspects of printing, the route of transmission was from China to the West.

Playing cards

Left: Chinese playing card found near Turfan, fifteenth century. Right: Queen of Wild Men, ca. 1440, engraving by the Master of the Playing Cards, with whom Gutenberg is thought to have worked

Printed playing cards were used in China from an early date, probably the ninth century. Cards were an early subject of printing because they were popular with all classes and thus demanded reproduction in quantity, and they require standardized backs so that the contents of the face cannot be known. In Europe too cards were one of the earliest applications of printing, “doubtless because of the early and widespread use in the East,” in the judgment of Tsien Tsuen-Hsuen. “Probably they were brought to Europe by the Mongol armies, traders, and travellers.”¹⁶ Helmut Lehmann-Haupt has produced evidence indicating that Gutenberg (who is said to have begun his career as an goldsmith) created copper engravings for playing cards prior to developing his printing press, apparently working in association with the artist known as the Master of the Playing Cards.

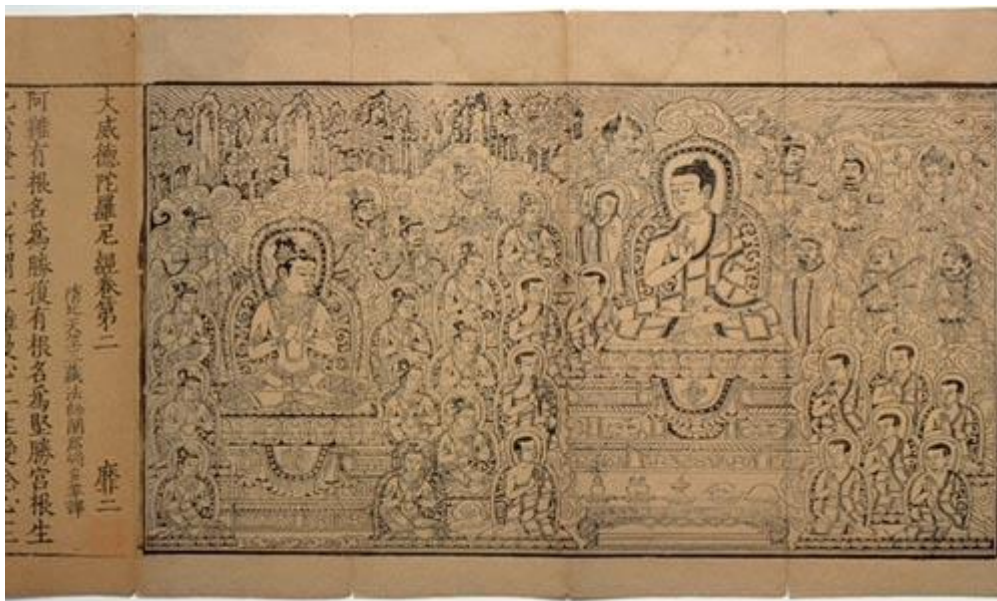
Woodblock book printing

In China a commercial book trade existed as early as the first century of the common era. Books were also commissioned by religious institutions and by the state. The earliest dated printed book was discovered in a cave temple at Tun-huang.¹⁷ A scroll about sixteen feet long, it is a copy of the Buddhist Diamond Sutra, bearing a date equivalent to 868. The quality of the printing is remarkably high, suggested an established print industry.



Frontispiece of the earliest dated printed book, the Diamond Sutra, dated 868.

The entire Buddhist canon was printed by imperial decree around 1000, and it was reprinted several times in following centuries. One of these is the Jisha edition, named for the island where the monastery that commissioned the printing was located. The printing was begun in 1231 but completed under the Mongol rule of the Yuan dynasty. The complete edition consisted of 6,362 printed volumes containing 1,532 texts entailing the carving of more than 150,000 woodblocks.



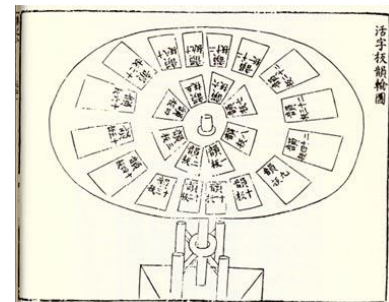
Chapter 2 of the Magical Charm Scripture of Great Splendor, 1231–1322, Yenshengyuan Monastery, Jisha, Suzhou, Jiangsu province. (Asian Art Museum, San Francisco).

Woodblock printing became popular in Europe in the fourteenth century. The blocks used were remarkably similar to Chinese woodblocks. Robert Curzon (1810–1873) was one of the first to pursue the similarity between Asian and European block books to its logical conclusion, arguing that “we must suppose that the process of printing them must have been copied from ancient Chinese specimens, brought from that country by some early travelers, whose names have not been handed down to our times.” “Since all the technical processes are of Chinese rather than European tradition,” adds Tsien Tsuen-Hsien, “it seems that the European block printers must not only have seen Chinese samples, but perhaps had been taught by missionaries or others who had learned these un-European methods from Chinese printers during their residence in China.”¹⁸

The Development of Movable Type

The invention of movable type in China is attributed to the Sung dynasty inventor Bi Sheng (ca. 990–1051; spelled Pi Sheng in the Wade-Giles transliteration system used in the extract below) in the eleventh century. His process was described by Shen Kua (ca. 1031–1095). Bi’s types were made of baked clay. They were set in an iron form, their position stabilized with heated resin and wax. After the printing was completed the wax and resin

Revolving type table from the Nung-shu of Wang Chen, 1313.



were melted to release the type for later reuse, as Shen Kua explains:

Pi Sheng, a man of unofficial position, made movable type. His method was as follows: he took sticky clay and cut in it characters as thin as the edge of a coin. Each character formed, as it were, a single type. He baked them in the fire to make them hard. He had previously prepared an iron plate and he had covered his plate with a mixture of pine resin, wax, and paper ashes. When he wished to print, he took an iron frame and set it on the iron plate. In this he placed the types, set close together. When the frame was full, the whole made one solid block of type. He then placed it near the fire to warm it. When the paste [at the back] was slightly melted, he took a smooth board and pressed it over the surface, so that the block of type became as even as a whetstone.

If one were to print only two or three copies, this method would be neither simple nor easy. But for printing hundreds or thousands of copies, it was marvelously quick. As a rule he kept two formes going. While the impression was being made from the one forme, the type was being put in place on the other. When the printing of one form was finished, the other was then ready. In this way the two formes alternated and the printing was done with great rapidity.

For each character there were several types, and for certain common characters there were twenty or more types each, in order to be prepared for the repetition of characters on the same page. When the characters were not in use he had them arranged with paper labels, one label for each rhyme-group, and kept them in wooden cases.¹⁹

Shen Kua reports that “When Pi Sheng died, his font of type passed into the possession of my nephews,” and Bi Sheng’s type was still being used to print philological primers and neo-Confucian documents during the rule of the Mongol emperor Khubilai Khan, by one of his personal councilors.²⁰

A report by Wang Chen in 1313 adds that tin type was also used. (The Chinese abandoned tin as a material for type because it would not hold the water-based Chinese ink.) Wang Chen spent more than two years cutting 60,000 type for use in his own wood-based movable-type printing. An illustration of his technique of laying type with a revolving table has survived.

Cross-Cultural Currents under the Mongol Empire



Left: Chinggis Khan pursuing enemies, from Rashid al-Din’s history (Bibliothèque Nationale, Paris; Ebrey, 170). Right: Khubilai Khan, by the Chinese painter Liu Guandao, 1280 (National Palace Museum, Taiwan; Ebrey, 174).

Under Chinggis Khan (prob. 1167–1227) the Mongols unified an enormous geographic territory—it is still history’s largest contiguous empire—under central rule. To accomplish this the Mongol army was ruthless to the point of genocide. In this climate the opportunities for cultural and technological exchange must have been limited. But by the time of the rule of Chinggis’s grandson Khubilai Khan (1260–1294) the situation was different. Khubilai Khan established the capital of his khanate in Beijing, where he assumed the Chinese “mandate of heaven” and established the Yuan dynasty. Not viewing China merely as an opportunity for plunder by nomadic warriors, he saw the value of agriculture and urbanism, and he retained many Chinese traditions.



Khubilai Khan as the first Yuan emperor, 13th century, National Palace Museum, Taiwan

Beijing was not central enough for unified rule of the entire empire, and the Mongols were often troubled by contentious issues of succession, with the result that the empire was divided into regional khanates. But Khubilai maintained good relations with his brother Hulegu, the Ilkhan of Persia. Hulegu, even more than Khubilai, had in many respects assimilated into the culture of his subject people, and he had converted to Islam. The result was a lively exchange between West Asia and East Asia. It was this climate that encouraged contact between Europe and East Asia.

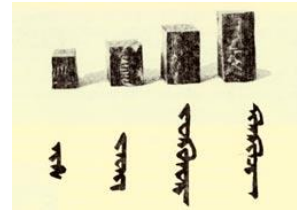
Muslim traders were active across much of the Mongol realm, including Korea. “Confucian Chinese officials had perceived commerce as demeaning and traders as parasites, but the Mongols did not share that attitude,” notes Morris Rossabi. “Khubilai removed many of the previous limitations imposed on trade, paving the way for Eurasian merchants and for the first direct commercial contacts between Europe and East Asia.”²¹ The Uighur people of Central Asia — a Turkic people (whose language is believed to be related to both Turkish and Korean) who had governed a large empire in the eighth and ninth centuries — helped to facilitate this trade.

Khubilai Khan sought to temper the influence of the native Han Chinese by peppering his court with Uighurs and other Muslims. Khubilai enacted regulations giving a variety of special privileges to Muslims, such as exemption from taxation and the right to private ownership of weapons. “Small wonder, then,” notes John D. Langlois, Jr., “that the Muslims were found in all regions of China in Yuan times.”²² Continuous Muslim settlement stretched from Central Asia across northern China. Muslim scholars founded a school in present-day Hopei, near the Yuan capital of Beijing. Muslim settlement extended to Korea, where historical records document the existence of established Muslim communities.

Centered along the Silk Road in Turfan in northwestern China, the Uighurs had been conquered by Chinggis Khan. He adopted the Uighur script for writing the Mongolian language. By this time many Uighurs had converted to Islam (some adopted Tibetan Buddhism). They included among their number a scholar class. Movable-type Uighur prints have been discovered in the Turfan area, along with wooden type fonts. The Uighurs were thus both ideally informed and ideally situated for transmitting information about printing from China and Korea to the Islamic territories of West Asia. “The introduction of printing farther to the west was probably accomplished by the Uighurs during the Mongol period,” Tsien Tsuen-Hsui maintains. “After the Mongol conquest of Turfan, a great number of Uighurs were recruited into the Mongol army; Uighur scholars served as Mongol brains, and Uighur culture became the initial basis of Mongol power. If there was any connection in the spread of printing between Asia and the West, the Uighurs who used both block printing and movable type had good opportunities to play an important role in this introduction.”²³



Wooden types and impressions in Uigur script, prob. early 14th century (Tsien, 306)



The most famous of the European travelers to Yuan China Marco Polo, a teller of tales whose account is notable for omissions and fabrications but does restrain some of the more fantastic elements common to some other travel narratives of the Mongol period (that of John Mandeville, for example). Polo claimed—how truthfully it is difficult to say—to have had an audience with Khubilai himself. However that may be, it is certain that European travelers visited the Yuan court in Beijing. There they would have been well situated to learn of Korea’s perfection of printing with movable metal type.

Latin tombstone, 1342, from Yang-chou, China.

Cast-Type Printing in Korea’s Goryeo Dynasty (918–1392)

The Goryeo dynasty (from which the name “Korea” comes) was founded by Wang Geon, who unified the country in 918 and established Buddhism as its state religion. Because China was in

transition after the collapse of its Tang dynasty in 906, Goryeo was able initially to flourish without undue concern about external affairs. A Song envoy, Xu Jing, produced a travel account in 1123 that depicted Goryeo as a sophisticated and well-managed society. Already, however, the country found itself forced to respond to threats from Central Asian peoples. Finally, in 1231, Mongol forces invaded. They were repulsed, but launched five more attacks over the next three decades, forcing the Goryeo court to withdraw to the island of Ganghwa. In 1270 the Goryeo king formally surrendered, and Mongols assumed control of Korea. Many native Koreans continued to oppose the Mongol occupiers, however, and since military resistance had failed, spiritual power was summoned through the printing of Buddhist texts.

Korea had a long and distinguished woodblock printing tradition. According to Kumja Paik Kim, “The oldest extant woodblock printed text on paper in East Asia is the Dharani sutra discovered in the Seokka-tap (Shakyamuni pagoda) in 1966 in Bulguk-sa Monastery in Gyeongju. Since this pagoda was completed in 751, the printed sutra placed within has the terminal date of 751.” Kim also notes the remarkable Goryeo dedication to reproducing the Tripitaka, leading up to the first printing with movable metal type:

This period is especially famous for carrying out monumental projects of carved woodblocks containing the complete set of Buddhist canon, the Tripitaka (sutras, laws, and treatises), not just once but twice. The first set, which was burned during the Mongol invasion in 1232, had been completed in 1087 to expel the invading Khitans through prayers to Buddhas. The second set, known today as Tripitaka Koreana, was completed in 1251 as prayers to the power of Buddhas for the protection of the nation from the invading Mongols. The second Tripitaka set, containing more than 8,000 woodblocks, is now housed in the repository in Haein-sa Monastery near Daegu. Goryeo is also credited with inventing movable metal type in the first half of the thirteenth century to meet the heavy demands for various types of books, both religious and secular. *Prescribed Ritual Texts of the Past and Present (Sangjong Gogeuem Yemun)* was printed with the movable metal type in 1234.²⁴

Under Mongol rule “Korea and China also grew closer, as the Mongol-enforced peace throughout their conquered territory allowed envoys and traders to move freely between the two countries. Goryeo officials served in the Yuan government, where because of their literary skill and knowledge of Confucian statecraft, they made contributions to governance.”²⁵ There was also a sea trade that connected Korea to China and points beyond (when Giovanni di Marignolli arrived at the port of Zhengzhou in 1346 he found a depot for European traders ready to receive him). Wang Geon served as an admiral in the Korean navy. Fifty-seven official diplomatic sea voyages, each carrying 100–300 emissaries, were recorded to Song China in the 160 years following the establishment of the dynasty. For a joint Goryeo-Mongol expedition to Japan in 1274 the Koreans built an armada of 900 ships in four and a half months.²⁶ Under Goryeo rule private merchants actively traded by sea with mainland ports—several arrivals of West Asian trading ships were recorded during the eleventh-century.²⁷ Consequently all of the conditions existed for the transmission of significant technological information from Korea to Europe.

Haein-sa Temple in Hapchon County, North Kyongsang Province, is home to the most complete and best preserved woodblocks of the Buddhist Tripitaka. Top left: the temple entrance. Bottom left: storage rooms. Right: Some of the more than 80,000 woodblocks used to print the Tripitaka (Park Seung-U, *Koreana* 7, no. 2, 34–35, permission pending).

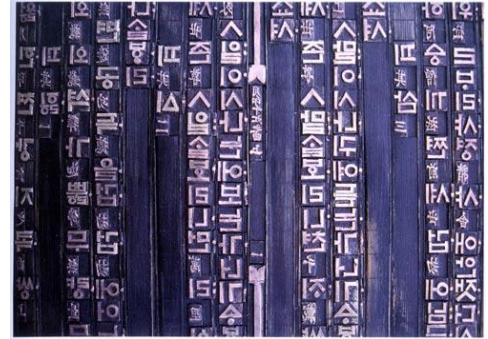


While the development of Korean metal type anticipated or responded to the need to replace documents abandoned or destroyed during the Mongol invasions, a contributing factor was the relative scarcity of appropriate hardwoods comparable to the pear wood and jube used in China. The Korean mold-casting method of producing fonts was probably based on their experience with bronze coins; Koreans were also accomplished in bronze casting of bells and statues. The “excellent workmanship,” “dignified form,” and “clear and even characters” of Korean coins were admired by Song dynasty Chinese scholars.²⁸ A fifteenth-century description of the Korean font casting process was recorded by Song Hyon:

At first, one cuts letters in beech wood. One fills a trough level with fine sandy [clay] of the reed-growing seashore. Wood-cut letters are pressed into the sand, then the impressions become negative and form letters [molds]. At this step, placing one trough together with another, one pours the molten bronze down into an opening. The fluid flows in, filling these negative molds, one by one becoming type. Lastly, one scrapes and files off the irregularities, and piles them up to be arranged.

Much of our knowledge of Goryeo printing is based on written records, as Korea's turbulent history has prevented many works from surviving. But one surviving book, the *Selected Teachings of Buddhist Sages and Soen Masters (Pulcho chikchi simch'e yojol)* contains a date equivalent to 1377, making it the earliest extant book printed with movable metal type. It was printed at Hungdok-sa Temple near Chongju (the ruins of the temple, including a typesetting foundry, were discovered during building excavation in 1985). The book was clearly printed with metal type for, among other telling features, some characters were printed upside down, their alignment is not always straight, and the inking is uneven in a manner not characteristic of block printing.²⁹

It might surprise the heirs of Gutenberg to learn that a woodblock version of this same book was printed just a year after the metal type printing. Today we are accustomed to think of movable-type printing with metal type as dramatically superior to woodblock printing, and certainly the European alphabets are ideally suited to this technique. But in East Asia the advantages were less clear-cut. The Jesuit missionary Matteo Ricci noted in the early seventeenth century that Chinese cutters could produce wood blocks as quickly as European typesetters could make up their pages. What's more, the wood blocks could be stored for later use, unlike the printers' forms used in the West, which were disassembled and the type returned to its cases when the printing had been completed. Woodblock technology also facilitated book illustration, which was far more advanced, and more common, in East Asia than in the West.



Printing plates from Song of the Moon's Reflection on a Thousand Rivers and Episodes from the Life of the Buddha (Worin ch'on-gang chi kok), Korea, Joseon dynasty. In the fifteenth century, during the Joseon dynasty that succeeded the Goryeo, a new system of writing Korean was introduced, which was better suited to movable type than the Chinese character system used during the Goryeo period (Park Seung-U, Koreana 7, no. 2, 27, permission pending).

Movable-type printing, as Shen Kun had already noted in the eleventh century, was of most value when a large number of copies were desired. The practicality of woodblock printing meant that in East Asia books could be produced in very limited runs, while the adoption of movable-type printing in the West meant that only commercial or underwritten publications could be published without great difficulty (a situation that has endured to this day). Thus in the West printing actually caused "an impoverishment of the written tradition," in the view of Jacques Gernet, "because publishers could not take the risk of bringing out works which were not assured of a fairly large sale."³⁰

But being a late-comer to printing was also a kind of blessing for Europe. The entire development of printing was highly compressed: Europe adopted paper in the eleventh and twelfth centuries; by the thirteenth century good-quality paper was being made in Italy. In the fourteenth century woodblock printing became widely adopted, and the following century saw the development of typographical printing, which spread with astounding rapidity. By contrast, China had used paper as the principal material for writing since the Han period, and the proto printing techniques of stamping and rubbing were also widely used during the Han. Woodblock printing was employed at least from the eighth century. All of these technologies were a routine part of East Asian culture by the end of the first millennium, so printing did not carry the shock of the new for East Asia as it did for Europe. Put another way, the impact of printing in East Asia, though in its way just as dramatic as in Europe, had long since occurred, contributing to the result that East Asian culture was in many respects more advanced than that of Europe; the Gutenberg boom amounted to a kind of catching up with the East.

So was Gutenberg influenced or inspired, directly or indirectly, by Asian printing? As Eva Hanbutt-Benz properly observes, "We do not know if Johannes Gutenberg had any kind of knowledge of the fact that long before his invention printing with moveable type was done in East-Asia."³¹ Still, as new information is discovered "the notion that knowledge of printing in the Far East could have found its way to Strasbourg or Mainz," in the view of one Western scholar of printing, "becomes more insistent and persuasive."³² While there is no "smoking gun" to establish a direct connection, there is plenty of circumstantial evidence suggesting that East Asian printing influenced early Renaissance Europe, and we may ask why movable-type technology should have differed from other print technologies in its development. While the continuous line of transmission from East Asia to Europe was for a time interrupted, under the mature Mongol empire widespread trade and exchange resumed, and this occurred around the same time that Korea perfected movable-type printing. The continuous line of cultural connection that existed between Korea and Europe through the fourteenth century would have enabled this technology to follow a similar route of transmission as those that preceded it.

Notes

1 Although Gutenberg is widely acknowledged as the first European to print with movable metal type, that honor is sometimes claimed for a handful of other printers. In addition, researchers Paul Needham and Blaise Agueria y Arcas have recently suggested that Gutenberg did not in fact use movable type as we understand it (*Princeton Weekly Bulletin* 90, no. 16). This dispute has little bearing on the present argument. [\[return\]](#)

2 Hanbutt-Benz, 41. For full bibliographical information on citations see the [selected readings](#). [\[return\]](#)

3 See Hanbutt-Benz for a discussion of some of the technical differences. [\[return\]](#)

4 Photocopying is a type of printing. The internet, on the other hand, inverts printing's solution to the replication of documents. While printing creates many copies, each providing one view at a time, the internet enables one document to have multiple simultaneous views. Therefore it can be regarded as a profound technological development, comparable in magnitude to printing. [\[return\]](#)

5 According to Marshall McLuhan, "Print created national uniformity and government centralism, but also individualism and opposition to government as such" (255). The democratizing element of printing may seem inevitable from the perspective of the European tradition — to Helmut Lehmann-Haupt, for example, "it seems quite understandable that printing . . . should have become associated with popular and democratic rather than aristocratic levels of cultural expression" (75). But this is not as strongly the case from the Asian perspective. [\[return\]](#)

6 Sohn (1959), 96–97. [\[return\]](#)

7 Tsien, 306–307. [\[return\]](#)

8 His account completely confirms Marco Polo's—except that nowhere is Polo mentioned. [\[return\]](#)

9 Morgan, 193 [\[return\]](#)

10 Printing was developed early in Korea and Japan as well as in China—eighth-century printed charms have been found in all three locations—but its story is easiest

to trace in China, which is of importance as the main conduit to the West. The complex stories of the development and spread of ink and glue technologies are beyond the scope of this essay. [\[return\]](#)

11 Tsien, 313. [\[return\]](#)

12 Twitchett, 12. [\[return\]](#)

13 Twitchett, 43. By the end of the century problems of inflation and currency devaluation resulted from overprinting of currency. [\[return\]](#)

14 Tsien, 293. [\[return\]](#)

15 Morgan, 165. [\[return\]](#)

16 Tsien, 310. [\[return\]](#)

17 A printing of the Dharani sutra, discovered in Korea in 1966, is undated but must have been produced before 751. The development of Korean printing will be discussed [below](#). [\[return\]](#)

18 Tsien, 313. [\[return\]](#)

19 Tsien, 201–202. [\[return\]](#)

20 Tsien, 203. [\[return\]](#)

21 Berger, 32. [\[return\]](#)

22 Langlois, 273. [\[return\]](#)

23 Tsien, 306 [\[return\]](#)

24 Kim, Kumja Paik (2003), 13. [\[return\]](#)

25 Edward Shultz, “Cultural History of Goryeo,” in Kim, Kumja Paik, 30. [\[return\]](#)

26 Young, “Korea’s Sphere of Maritime Influence,” 18. [\[return\]](#)

27 Kim, Kumja Paik, 19f2 [\[return\]](#)

28 Pow-key Sohn, 100. [\[return\]](#)

29 Ch’on, 20. [\[return\]](#)

30 Gernet, 336. [\[return\]](#)

31 Hanebutt-Benz, 41. [\[return\]](#)

32 Kapr, 109. [\[return\]](#)