

Mapping the Earth and Ordering the Heavens

The Circulation and Transformation of Jesuit World Maps and Star Charts on a Screen in the Late Chosŏn Dynasty

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Abstract This chapter delves into the exchange of Western pictorial motifs and techniques in copies of world maps and astronomical charts in the eighteenth century of the Chosŏn dynasty. Modeled after Sino-European world maps and star charts by Jesuit priests, these Korean works attest to the profound exchange of cartographic and astronomical knowledge between China and Korea. The influence of Jesuit world maps and astronomical charts not only spurred scientific advancements within Chosŏn society but also facilitated the connection of Chosŏn to the broader global network of knowledge and information.

Keywords Jesuits. World map. Star chart. Screen. Chosŏn dynasty.

Summary 1 Introduction. – 2 Interactions Between Korean Envoys and Jesuits Missionaries in China. – 3 Figured Manuscript Copies of the Jesuit's World Maps. – 4 Star Charts on Screens. – 5 Conclusion.

1 Introduction

This chapter explores the exchange of Western pictorial motifs and techniques in copies of world maps and astronomical charts in the eighteenth century of the Chosŏn dynasty. Modeled after Sino-European world maps and star charts by Jesuit priests – including Matteo

Ricci (1552-1610), Ferdinand Verbiest (1623-88), and Ignatius Kögler (1680-1746) – these Korean works attest to the exchange of cartographic and astronomical knowledge between China and the Korea. The Jesuits' materials that were exported to Korea and their reproductions serve as useful resources for discussing changes in the Sino-centric worldview and Confucian ideologies shared by Chosŏn intellectuals. In addition, this chapter will demonstrate how Western knowledge was transmitted to the Chosŏn, how foreign pictorial images were understood and modified, and how this newly imported techniques, artworks and ideas affected Koreans' self-identification and worldview.

Comparing diverse visual and textual sources from China and Europe, the discussion will then expand to scrutinize the transformation of pictorial motifs, the advancement of geographical and astronomical knowledge from the standpoint of cultural exchange between the East and the West, and Chosŏn Koreans' response to the West within the socio-cultural context. Lastly, this chapter delves into not only the scientific accuracy of the reproductions but also the political context surrounding the royal patronage of the reproduction, the symbolic meaning of map- and calendar-making in Confucian society, and the characteristics of screens as royal regalia. Pictorial maps on folding screens offer valuable opportunities for examining the ritual roles that screen paintings played in and the transformation or domestication of foreign images and technologies have occurred in Chosŏn society. Whereas the Sino-European maps and star charts were mainly made to be hung on the walls or printed in books in China, extant Chosŏn versions were produced on large-scale hand-colored folding screens. This requires a thorough analysis of the multiple functions and significance of the screen format specific to the late Chosŏn court, which offers insights into the Chosŏn Koreans' response to 'global encounters'.

2 Interactions Between Korean Envoys and Jesuits Missionaries in China

Although Korea had not established direct contact with the Jesuit missionaries in the late Chosŏn period, the world maps and the astronomical ideas of the West flowed into Korea mainly through diplomatic missions returning from Beijing (Shin 2006; Lim 2016b). The Chosŏn kingdom played the role of faithful tributary to the Ming and Qing dynasties until 1895. Ming emperor was regarded as the 'Son of Heaven' in the Sino-centric world, and the Chosŏn paid respect to China by adopting its ritual protocols and sending tributary embassies regularly. This marked the start of Korea's entry into the realm of Confucian civilization through the noble culture of the Ming. Af-

ter the Manchu's military campaigns to the Chosŏn in 1627 and 1636 and the subsequent demise of the Ming empire, Korea transferred its formal tributary obligations from the Ming to the Qing in 1637. Although the Chosŏn government was forced to accept Qing suzerainty, the court and the ruling elites of Korea - who considered the Ming as the legitimate successor of the culture of the 'Middle Kingdom' and the Qing as the barbarians who threatened the harmonious orders of the Confucian civilization - expressed hostility toward the new Manchu regime and claimed themselves to be the last bastion of true Confucian civilization (Haboush 1999). During the Qing dynasty, the Chosŏn dispatched four tributary embassies to the Qing annually to attend the official rituals of the Qing court on the occasions of the three junctures and annual tribute, respectively. Each envoy included thirty-five official envoys and two to three hundred workers.¹

During such diplomatic visits, a series of gift exchanges took place. In addition to the official gift exchange between the Chinese emperor and Korean king, gift-giving and receiving through personal contacts occurred *en route* to Beijing also constituted an important conduit whereby the Korean embassy might accomplish various practical goals, such as obtaining several books, paintings, and calligraphies, luxury items, and learning new technologies. Among the new information and knowledge acquired through such diplomatic exchanges, Jesuit cartography and astronomy particular attracted Chosŏn intellectuals' attention. In 1631, the first contact between a Korean envoy, Chŏng Tu-Wŏn 鄭斗源 (1581-?), and Joaõ Rodrigues (1561-1633), a Portuguese Jesuit skilled in astronomy and temporarily stationed in the military campaign of Dengzhou, Shandong Province, brought meaningful results.² Rodrigues presented Chŏng with a number of books on European astronomy and geography, as well as a world map, a telescope, a sundial, and automatic striking clock, and pair of small firearms. Through this encounter, Chŏng received a set of five sheets of maps entitled *Complete Map of Ten Thousand Li* (*Wali quantu* 萬里全圖), which is believed to be Matteo Ricci's map, *Records of Areas Outside the Concern of the Imperial Geographer* (*Zhifang wajiji* 職方外紀), a geographical treatise by Giulio Aleni (1582-1649), *Explanation of*

1 Four major junctures of ritual importance are New Year's Day, the emperor's birthday, the winter solstice, and for the presentation of annual tribute. In the 257 years from 1637 through 1894, Chosŏn sent envoys to the Qing court a total of 507 times, while the Qing from 1636 through 1880 dispatched imperial envoys only 169 times.

2 The meeting was on Chŏng's return trip to Seoul from Beijing, in the 5th lunar month of 1631. The encounter between Chŏng and Rodrigues was unexpected; Chŏng travelled to China as an official tributary envoy of the Chosŏn dynasty to convey King Injo's condolences to the Ming Emperor Chongzhen 崇禎 (r. 1628-1644), whereas Rodrigues was sent to assist Ming China from the Portuguese colony at Macao in response to the Ming's request for military aid against the Jurchens. When conflicts between the Ming and Jurchen were ever-intensifying, they were sent to China as the Ming's foreign allies.

the Telescope (*Yuanjing shuo* 遠鏡說) by Johann Adam Schall von Bell (1591-1666), a telescope (*qianlijing* 千里鏡), *Star Maps of the Northern and Southern Hemispheres* (*Tianwen tu nanbei ji* 天文圖南北極), a sundial (*riguiguan* 日晷觀), an automatic striking clock, a gun (*niaochong* 鳥銃), and *Memorial by the Westerner for Presenting Powerful Cannon* (*Xiyang gongxian shenwei dachong shu* 西洋貢獻神威大銃疏) (Lim 2016a). The Jesuit's world map, presumably a six-scroll map drawn by Matteo Ricci in 1602, was introduced to Korea as early as 1603, and its first record was found in *Classified Essays of Jibong* (*Chibong yusöl* 芝峰類說) written by Yi Su-Gwang 李晬光 (1563-1628), a famous Korean scholar (Üçerler 2016, 3-4). Chōng suggested that Jesuits' gifts contributed to the fields of astronomy and military technology. In particular European astronomical knowledge would be helpful in reforming calendrical methods and correcting the errors in the positions of meridian stars. After about a decade, Schall von Bell befriended with the Korean Crown Prince Sohyōn 昭顯世子 (1612-45), who was then a hostage to the Manchu court in Shenyang and the Qing capital Yanjing. When the prince was finally allowed to return to Korea in 1645, the missionary presented him with books on the Western calendar and science, a map, a celestial globe and images of Christ.

From the late seventeenth century onward, the tension and conflicts between Qing and Chosŏn had been relaxed and limits on the activities of Korean envoys were lifted. They were allowed to tour the city and meet Chinese freely. Some of the most frequented places in Beijing were Catholic churches, where Korean emissaries met and conversed with the Jesuits. Korean envoys were eager to visit the churches and learn Western knowledge from the Jesuits. Some of them succeeded in establishing a favorable relationship with the Jesuit priests and were presented with various books, scientific instruments, maps, and oil paintings (Yi 2015).³ For instance, Yi Ki-Ji 李器之 (1690-1722), who visited Beijing on a tributary mission in 1720, befriended Portuguese and French Jesuits and visited the Catholic churches a total eleven times during his two-month stay. He was interested in the Jesuit's methods of astronomical calculation and their production of scientific instruments such as armillary spheres, mechanical clocks, telescopes, and other optical apparatus. Through this series of encounters Yi Ki-Ji received many valuable gifts, including a telescope, paper armillary sphere, a star atlas, Matteo

3 The influx of Western paintings by Chosŏn envoys is mentioned by Yi Ik 李瀾 (1681-1763) in his *Sŏngho's Encyclopedic Discourse* (*Sŏngho sasöl* 星湖僿說), vol. 4: "Most of the envoys traveling to Beijing recently bought Western paintings and have them hanging on their walls". Yi Ki-Ji 李器之 (1690-1722), who visited Beijing in 1720, received seven Western paintings, and Yi Ŭi-Hyŏn 李宜顯 (1669-1745) was gifted fifteen paintings. Yi Kyŏn-Myŏng 李健命 (1663-1722) was presented with books of drawings and paintings by a Westerner in 1722.

Ricci's *The True Meaning of the Lord of Heaven* (*Tianzhu shiyi* 天主實義), Verbiest's *Map of the World* (*Kunyutu* 坤輿圖), alarm clocks, portable sundials, cigarettes, paintings, and poison-absorbent rocks (*Hüpchöngsök* 吸毒石) (Lim 2010). In the wall and ceiling paintings of the Jesuit church, the realistic and accurate representations achieved through linear perspective and shading effects were of utmost interest to the Chosön envoys visiting the Churches. The illusionistic mural paintings, which were mainly associated with Italian church frescoes of the Baroque period, made a deep impression on the Chosön viewers. Their responses are detailed in the Beijing travelogues by Yi Ki-Ji 李器之 (1690-1722), Yi Tök-Mu 李德懋 (1741-1793), and Pak Chi-Wön 朴趾源 (1737-1805) (Yi 2015; Sö 2019a). Korean envoys who realized the practical importance of such astronomical knowledge visited the Qing Bureau of Astronomy (*Qiantian jian* 欽天監) during their tributary mission to China. In particular, Chosön scholars and astronomers were interested in Western astronomy as it was essential knowledge to conduct an accurate calendrical calculations that were necessary for the implementation of the *Shixianli* 時憲曆 (Calendar of the Conformity of Time), the new Qing calendrical system invented by Schall von Bell. Hong Tae-Yong met Augustin von Hallerstein and Anton Gogeisl at the South Church in Peking during his trip to Beijing in 1766. Through sporadic visits to the church and conversations with Jesuit astronomers, Hong was able to see the Jesuit's astronomical apparatuses and learn their views on celestial phenomenon and the structure of the heavens. He was given two pieces of small prints, woodblock-printed books, dried fruits and two pieces of poison-absorbent rocks (Baker 1982, 232-4).

Gifts from the European missionaries, unfortunately, were not fully appreciated in the early seventeenth century and were denounced as "deceitful, strange and useless things" (Lim 2016a, 157). However, when Western learning took root in Korea and Chosön intellectuals realized the value of such cartographic and cultural achievements, the Jesuit world maps, and star charts became important objects for the official envoys to see and then acquire them during their tributary missions to China. Many Jesuit cartographic works and celestial charts were brought into Korea, including several versions of Ricci's maps, Aleni's *Complete Map of Ten Thousand Countries* (*Wanguo quantu* 萬國全圖, 1623), Ferdinand Verbiest's *Complete Map of the World* (*Kunyu quantu* 坤輿全圖, 1672) and *Two General Maps of the Stars South and North of the Equator* (*Chidao nanbei liangzong xingtu* 赤道南北兩總星圖, 1674), and Ignatius Kögler's *Two General Maps of the Stars South and North of the Ecliptic* (*Huangdao nanbei liangzong xingtu* 黃道南北兩總星圖, 1723). These Jesuit world maps and celestial charts were considered gifts of practical and political value to be reproduced under the royal patronage.

3 Figured Manuscript Copies of the Jesuit's World Maps

As Korea lacked direct contact with the Jesuit missionaries until the nineteenth century, world maps such as Ricci's were transmitted to the peninsula by Korean envoys returning from Beijing. Yi Su-Gwang's record in 1603 presents one of the earliest Korean encounters with European world maps brought to the court by an envoy. Yi simply called it a "terrestrial map of European countries" and it was drawn by a certain "European envoy" named Feng Baobao (馮寶寶). Because it consists of six scrolls, previous research has suggested that it is a copy of the famous *Complete Map of Ten Thousand Countries of the World* (*Kunyu wanguo quantu* 坤輿萬國全圖) by Ricci and Li Zhizao 李之藻 (1565-1630) in 1602 (Lim 2011, 278-9).

Matteo Ricci's world maps widely circulated in the Chosŏn and were even copied by royal order in 1708. When the Royal Bureau of Astronomy (*Kwansanggam* 觀象監) offered the copy of Shall von Bell's star atlas to King Sukchong 肅宗 (r. 1674-1720) in the spring of 1708, the king was duly impressed.⁴ He ordered a copy of its terrestrial companion, which was ready later that year. Chief State Councillor and Director of the Royal Bureau of the Astronomy Ch'oe Sŏk-Chŏng 崔錫鼎 (1646-1715) supervised the reproduction at that time. Three Korean copies resulting from this project are known, each in the form of an eight- or ten-panel screen with the 1708 preface by Ch'oe Sŏk-Chŏng. Court sponsorship of the reproduction of these two Jesuit maps was for practical and ideological reasons. First, it was driven by an urgent need of the Chosŏn court to keep its calendrical system in accordance with that of the Qing calendar. The *Shixian li* calendrical system based on Schall von Bell's methods was promulgated in 1645 after the Manchu conquest and Chosŏn, as a tributary country to the Qing, immediately adopted this new system. However, the lack of knowledge caused the noticeable discrepancies between local and the Qing calendars, so King Sukchong wanted to master the principles of the new Jesuit astronomy. Second, Ming loyalism was salient at Sukchong's court, which culminated in the establishment of the Altar for the Great Repayment (*Taebodan* 大報壇) in the rear garden of Changdŏk Palace in 1704.⁵ Ming loyalism and anti-Qing sentiment were deeply rooted in the minds of Chosŏn intellectuals even in the sixty years after the demise of the Ming dynasty in 1644. Choe's preface illuminates how Chosŏn intellectuals' Confucian ideology and perception of the Western world map stemmed from a Sino-centric worldview (Pegg 2019, 49).

⁴ Adam Schall's astronomical chart, *Two General Maps of the Stars South and North of the Ecliptic*, served as a model of the 1708 screen.

⁵ This monument was built to commemorate Emperor Wanli's generosity and benevolence in salvaging Chosŏn during the Imjin War.

Although the terrestrial maps of past and present [in East Asian tradition] have adopted a variety of ways [of representing the world], commonly observed were [first] to represent a square earth as a flat surface and [second] to limit the scope of the maps up to the region that the sagely teaching of China had reached. The Western scholars' ideas, however, adopted as the fundamental principle [the idea of] a round earth. They said, "The heavens are round and so is the earth". [...] Across all the surface of the round earth, they put ten thousand countries and their names. The Nine Provinces of China are located on the Asian Continent and near the Northern Region. Their teachings are exaggerated and fabulous, which lie beyond reasonable discussions and thus could not be counted as orthodox teachings. (Lim 2011, 288)

Ch'oe found that the Western's idea of a round earth and the cosmological structure of concentric spheres offered a more reasonable explanation of the systematic correspondence between heaven and earth. In providing an accurate explanation of the relationship between terrestrial phenomena, such as changes of seasons and the division of climate zones, the European maps worked better than the traditional ones, which were characterized by the pictorial representations of topography and the heavy textual explanations of geography from more cultural and historical perspectives. Despite his objective evaluation of the Jesuits' cartographical and geographical achievements, his association with the Ming legacy have become obsolete; he emphasized that the screens bears characters reading "in the Mujin year of the Chongzhen reign" and "Unity of the Great Ming" (*daming yitong* 大明一統). Ch'oe also attempted to link the Jesuit world map to "the calendar of the Zhou dynasty" (*wubong juryōk* 禹封周曆), that is, the sacred institution of geography and astronomy created by the sage rulers in the ancient 'Middle Kingdom' (Lim 2012, 221-2). Ricci's map had its origin in Ming China and thus reminded the Chosŏn court of the Middle Kingdom's principles of 'order'. The Chosŏn court justified its status by lending a noble origin of Ming legacy to the barbarian objects. This response reflects the government's ideological agenda to establish the Chosŏn dynasty (1392-1897) as the last bastion of the Confucian civilization after the collapse of the Ming empire in 1644. By commemorating the legacy of the Ming dynasty embedded in the Jesuit maps, Chosŏn intellectuals extended the lineage of the Middle Kingdom to elevate Korea's position as the legitimate successor of Ming culture (Lim 2016b).

Copies of Ricci's maps were made on at least three occasions; the copy (1708) in the collection of the Seoul National University Museum (SNUM) [fig. 1], the copy (ca. 1766) formerly housed in Bongsŏn Temple but nothing is known about its current whereabouts [fig. 2], the copy in the collection of Nanban Bunkakan Museum in Osaka. The



SNUM screen consists of eight panels; prefaces by Ricci and Ch'oe occupy a panel each, flanking the six panels of the map with figures.⁶ At the corner of the seventh panel it shows representations of the northern and southern hemispheres, and the corner of the second shows the nine levels of heaven and an armillary sphere. The Nanban Bunkakan map has ten panels, with a configuration similar to that of the SNUM map.

As aptly pointed in previous studies, zoological depictions of animals around the world reflected advanced knowledge of natural history during the Age of Discovery in Europe. The sea creatures and animals, and ships on the maps seem to be derived from European models but show modified styles, pictorial elements and compositions. The images of the animals derive from *Historia Animalium*, the famous zoological encyclopedia published by Conrad Gessner in the sixteenth century. These images were adopted in the *Complete*

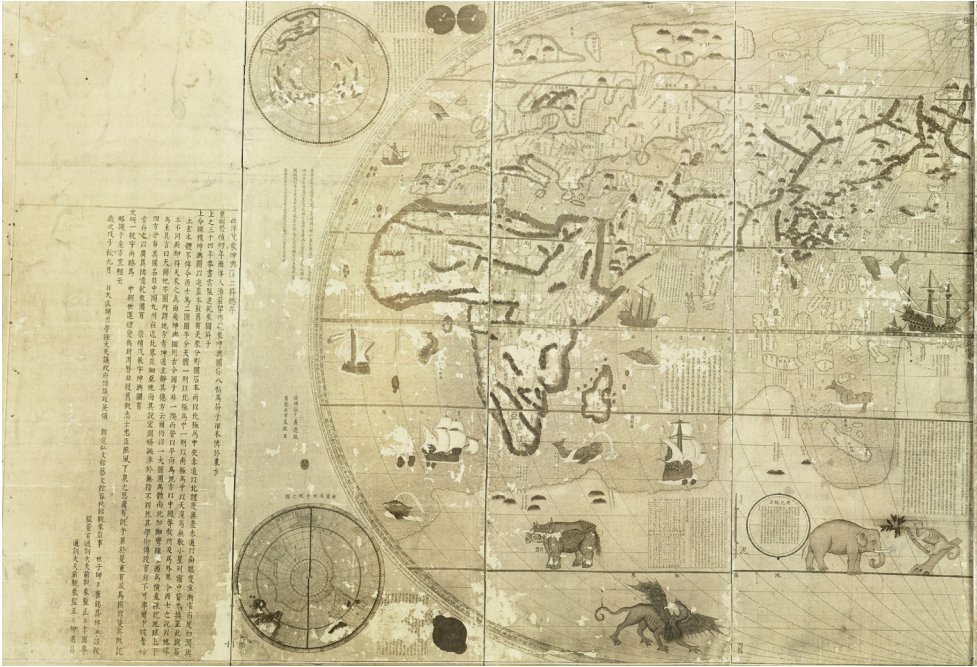
⁶ For the image of the *Complete Map of Ten Thousand Countries of the World* in the Nanban Bunkakan collection, see Minako Debergh (1989, 428-35, figs 1, 3, 4).



Figure 1 Attr. Kim Chin-Yŏ, *Complete Map of Ten Thousand Countries of the World*. 1708. Eight-panel folding screen, ink and color on paper, 172 × 531 cm, Seoul National University Museum

Map of the World compiled by the Flemish Jesuit Ferdinand Verbiest in 1674 (Day 1995; Cheng 2019). Compared to the woodblock print of Ricci's original map in 1603, the most discernable aspects of the Korean copies are the addition of exotic animals and European sailing vessels. Many convincing arguments commonly assume that a multi-colored world map with figures made for imperial perusal was the Chinese model for the Korean figured maps (Pegg 2019, 49). For instance, an elaborately decorated version of Ricci's map was produced in 1608 at the request of eunuchs to delight the Emperor Wanli 萬曆 (1572-1620). The eight-panel screen map by Pantoja and Urisis just after 1612 presumably features the figures to leverage the emperor's interests in the maps from Europe (Cheng 2019).⁷ Figures were

⁷ Only seven figured manuscript copies of Matteo Ricci's maps were known; copies in the National Library of China (Beijing), the New Bedford Whaling Museum, the Nanban Bunkakan (Osaka), the Nanjing Museum (reproduction in the Palace Museum), SNUM, two lost copies from previously housed in Pongsŏn Temple and formerly owned by G. Nicolas, a French wine merchant in Beijing during the 1930s, and two panels auctioned by Kaminski in 2016. According to Cheng Fangyi, these were all appar-



added on to these two maps to attract the Ming emperor's interest, which in turn helped to expedite the processes of mapmaking and the circulation. When the figured manuscript maps were transmitted to Korea, due to their visual attractiveness and decorative quality, they were more likely to appeal to the Chosŏn king as they had to the Chinese monarch.

The hand-drawn copies in the late Chosŏn period embraced a variety of animal motifs and sea vessels depicted through Western pictorial techniques such as shading, cross-hatching, or foreshortening. The world maps in 1708 were rendered by court painters of the Royal Bureau of Painting (*Tohwasŏ* 圖書署) in the late Chosŏn dynasty. The awkward cross-hatching and inaccurate foreshortening illustrate the court painters' rudimentary understanding of European techniques. The twisted body and turned head of the mythical beast, however, convey a sense of volume and movement in space.

ently based on Ricci's famous *Complete Map of Ten Thousand Countries of the World*, the 1602 printed version.



Figure 2 *Complete Map of Ten Thousand Countries of the World*. Photo taken in 1932. Black and white photography, 29 × 62 cm, the screen formerly housed in Pongsŏn Temple, Kyujanggak Institute for Korean Studies (奎25289)

Although similar territorial shapes, depictions of animals and sea creatures, and explanatory texts appear in the three manuscript copies of Ricci's world map, a subtle difference can be noted among them. Two screens in the former collection of Pongsŏn Temple and Nanban Bunkakan are painted on silk, and both carry the monogram IHS, the seal of the Society of Jesus. By contrast, the screen of the SNUM was painted on paper omitting the IHS symbol. The inscriptions indicate that the former two works were completed in the ninth lunar month of 1708, whereas the latter one was completed in the eighth. The fact that three copies of the same world map were reproduced in such short time raises questions as to the relationship among the three screens, as well as the purpose behind their production. Earlier research assumes that the SNUM screen was a draft made prior to the Pongsŏn Temple screen in that the former work shows the cruder renditions of figural motifs and the more obvious errors in the texts and cartography (Yang 2012, 53-5).



However, it is hard to believe that such a large-sized painting with colors was merely a sketch. In addition, the shadings effects and voluminous body shapes of the animals in the SNUM screen suggest that it was a completed work, rather than a draft. Differences in calligraphic style are also noticeable; the inscription on the SNUM screen was done in running script, which allows for personal touches and a wide range of speed in the execution of the strokes. However, the Pongsŏn Temple screen and the Nanban screens bear a neatly executed clerical script, an intense style font commonly seen in the official documents and the inscriptions for the king's appreciation. This



Figure 3 Complete Map of the World. Eighteenth century. Eight-panel folding screen, ink and color on silk, 168.8 × 391.8 cm, Busan Museum

suggests that the Pongsŏn Temple screen and the Nanban screens were produced for kings, whereas the SNUM screen was likely made for the high officials of the Royal Bureau of Astronomy involved in the 1706 project (Sō 2019a, 140-1).

The empty spaces in the southern continent then known as ‘Magellanica’ are filled with lively representations of a total eight land animals and eighteen sea creatures and several ships in the ocean. The eight animals include a rhinoceros, a winged creature, an elephant, a sloth, a Patagonian *sú* (*succarath*), a crocodile, a lion and a great rhea. Figures in the three works closely resemble their Si-

no-European precedents, but the details and colorings show variations. The Pongsŏn Temple screen shows the most delicate and accurate depictions in the scales and wrinkles of the fish as well as the teeth and eyes of the animals. Those of the SNUM screen are more distorted and curtailed than those in the other two maps. The Nanban map is paired with a ten-panel screen featuring the celestial chart modeled after *New Astronomical Chart* by Kögler in 1723. The astronomical chart also contains excerpts of explanatory texts from the *Compendium of Calendrical Science and Astronomy* (*Lixiang kaocheng* 曆象考成) compiled by the order of Emperor Qianlong 乾隆 (r. 1735-96). Through the collaborative efforts of Jesuit astronomers – such as Kögler, Augustin von Hallerstein, Anton Gogeisl, and Felix da Rocha (1713-81) – *Lixiang kaocheng* was completed with a preface by Emperor Qianlong in 1757. This work was transmitted to Korea by astronomer-envoy Yi Tök-Sŏng in 1766, which proves that the Nanban screen was reproduced in Chosŏn after 1766 (Debergh 1986).

The 1674 map of Ferdinand Verbiest was made for Emperor Kangxi 康熙 (r. 1654-1722) and included updated information about the Americas and China as well as images and descriptions of strange and exotic animals of the new world. The manuscript copy of the *Complete Map of the World* was also rendered in the format of an eight-panel folding screen. The screen currently in the collection of Busan Museum [fig. 3], which closely follows the Verbiest's map of 1674, consists of the six panels depicting the northern and southern hemispheres and two outermost scrolls displaying four baroque-style 'cartouches', respectively. The texts provide information on the Aristotelian theory of the Four Elements, atmospheric phenomena, earthquakes, humankind, rivers, and the great mountains.

Verbiest's maps present various animals such as a rhinoceros, chameleon, salamander, alligator, giraffe, lion, beaver, hyena, ostrich, unicorn, flying fish, American turkey, and arachnids. In the sea appear whales, seahorses, a merman and a mermaid, and various monsters. Text and images for the creatures were taken from Verbiest's *Illustrated Explanations of the World* (*Kunyu tushuo* 坤輿圖說), a geographical work he published slightly earlier in 1674. As reknown, Conrad Gessner's (1516-65) zoological encyclopedia *Historia Animalium*, compiled between 1551 and 1586, was used as a primary source for Verbiest's zoological treatise. In addition, various European sources such as Olaus Magnus' (1490-1557) *Carta Marina* (1539), Abraham Ortelius' (1527-98) *Theatrum Orbis Terrarum* (1570), Ulisse Aldrovandi's (1522-1605) *Historia Animalium* and Johannes Johnston's (1603-75) *Historiae Naturalis* (1650-53) served as a model for seventeenth-century Sino-European world maps (Mir 2016). The Jesuit cartographers used materials available in the libraries of Beijing's four churches. Among many references, *Records*

of *Areas Outside the Concern of the Imperial Geographer* (*Zhifang waiji* 職方外紀) compiled by the Italian Jesuit Giulio Aleni and published by the Hangzhou scholar Yang Tingyun 楊廷筠 (ca. 1560-1627) played a pivotal role; some of the ships, animals, and texts on the manuscript versions are strongly related to those of *Zhifang waiji*.

In terms of rendering, the artist of the Busan screen is clumsy and less accurate in the representation of details. Some figures closely follow the Sino-European models, while others are more distorted than the images appearing on the *Kyungyu wanguo quntu* of 1708. Comparisons of the *sú* (*succarath*), a lion-like creature carrying cubs on its back, reveal variations in the iconography and styles of animals drawn on the maps. The image first appears in Andre Thevet's (1516-90) description of a ferocious beast inhabiting Patagonia. The image also appeared in Gesner's renowned zoological treatise, *Historia Animalium*, before being incorporated into Verbiest's *Complete Map of the World* (Lai 2018, 144-6). The *sú* appears in both Chosŏn versions of manuscript world maps, but they are quite different as if they derived from two distinctive sources. The *sú* on the *Complete Map of the Ten Thousand Countries of the World* looks like a lion with a human face, featuring a curly mane and furry tail. The beast's foreleg is raised as if stepping forward. Long thin hair covers the body. By contrast, the *sú* in the Busan screen presents a strange combination of sunken eyes, a monkey-like face with a goatee and a flat abdomen. The latter more closely resembles Verbiest's map of 1674. The stylized rendering of three cubs on the back, bizarre shapes of appearance, and the lack of details such as individual hairs indicate that the Chosŏn painter did not successfully use the European pictorial techniques of volume and texture with modeling to depict the anatomy more reasonably. The Busan screen has paper backing that bears the characters for Sujin Palace (*Sujingung* 壽進宮) in Seoul and the calligraphy inscribed on the screen resembles Ming-style printing type, which was widely used in the first half of the eighteenth century in the Chosŏn dynasty (Yi 2012). This indicates that the screen was produced during the palace in early eighteenth century.

Lastly, it is noted that extant copies of the Sino-Jesuit world map were done in a screen format. This was unusual format for a map, as Western maps were often made to be hung on walls or to be printed in books, whereas their Chinese and Japanese counterparts were produced in diverse forms, such as albums, hanging scrolls, and folded maps. Academic attention to the format invites a socio-cultural analysis of the historical function and aspects of the screen-formatted maps from the period, providing important clues for understanding the distinctive Korean qualities and transfiguration of the colored manuscript of world maps.

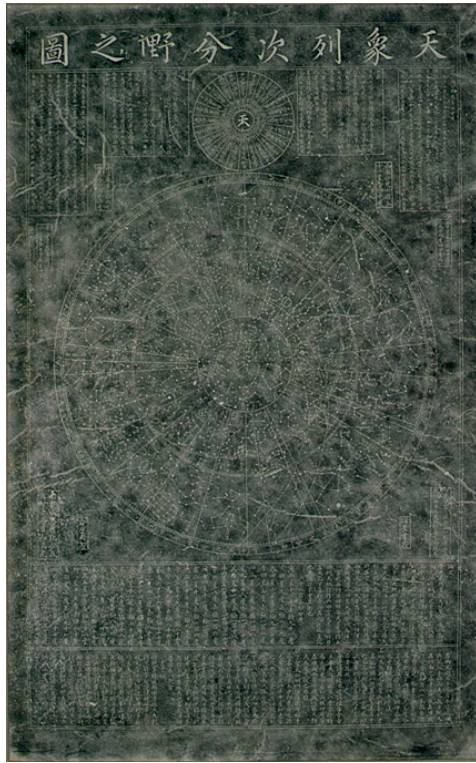


Figure 4
*Positions of the Heavenly Bodies
in Their Natural Order and Their
Allocated Fields. 1687 (copy after
the 1395 star chart). Ink rubbing,
108.5 × 206.5 × 30.2 cm, National
Palace Museum of Korea*

4 Star Charts on Screens

In the East, the traditional notion of *chaeiron* (災異論) means that unusual astronomical phenomena are closely related to the ruler's political successes and failures. Accordingly, observing and predicting heavenly phenomena such as lunar eclipses and the calculating the celestial movements are the prime duties of a Confucian monarch who rules by heavenly mandate. Making an accurate calendar in exact accordance with the heavenly phenomena symbolized imperial authority and made possible the harmonious lives of the people under the heavens. Thus, issuing the state's calendar was considered an imperial prerogative exclusively implemented by the emperor and not by the rulers of tributary countries. According to the traditional Sino-centric world order, the emperor's gifts of calendars to his tributary states epitomized his superiority, while the reception thereof indicated the tributary ruler's submission to imperial power. As Chosŏn was conventionally regarded as a tributary state of the Chi-

nese empire, it was supposed to use the calendar that the emperor had decreed. The so-called 'calendar mission' (*yŏkhaeng* 曆行), whose task was to receive the imperial calendar issued by the imperial Bureau of Astronomy for the next year, was sent to Beijing on the tenth month of each year (Lim 2016b, 154-8).

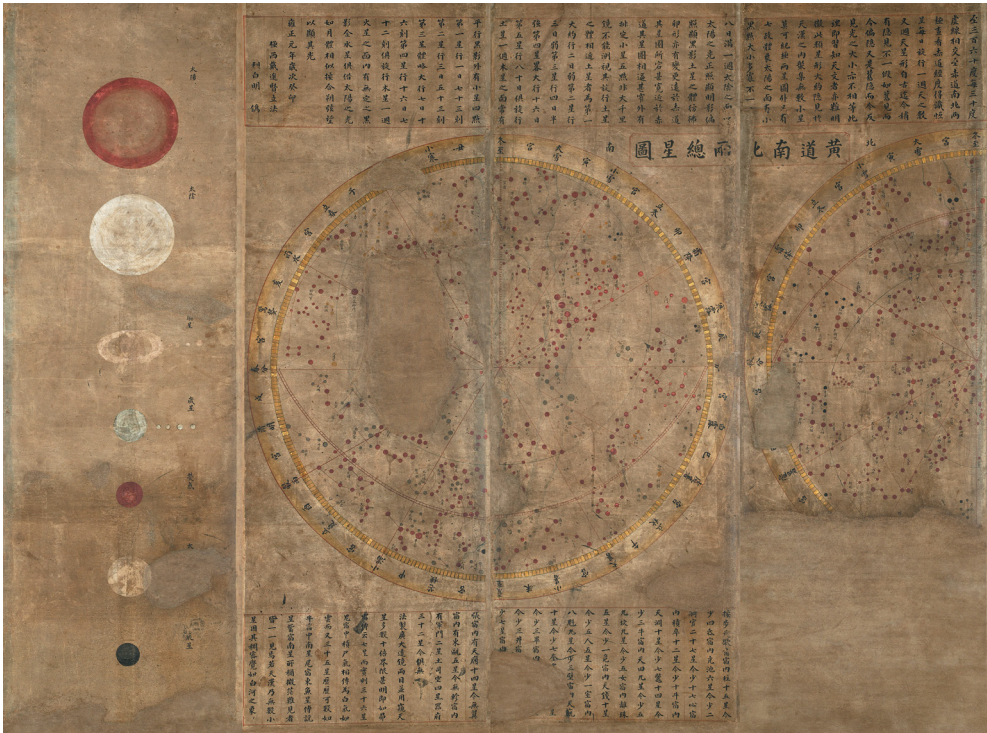
After the *Shixian li* (Calendar of the Conformity of Time) designed by Adam Schall von Bell, the German Jesuit missionary and director of the Imperial Bureau of Astronomy of the Qing dynasty, was promulgated as the official Qing calendrical system in 1645,⁸ the Chosŏn court soon adopted this Western calendrical methods for practical and diplomatic reasons in 1653 (185).⁹ However, these calendar reforms were not fully embraced by the Chosŏn court. Until enough knowledge about the techniques of calendrical astronomy had been acquired by the Chosŏn, they were enthusiastic about the contacts with the Jesuit astronomers of the Imperial Bureau of Astronomy in Beijing.¹⁰ King Sukchong was one of the Chosŏn monarchs who were keenly interested in the Qing calendar and continuously sent astronomer-envoys to learn the astronomical calculation and to obtain books on the Western calendar system. In addition, he commissioned a series of reproductions of Jesuit's world maps and star atlases. For example, in 1708 the Royal Bureau of Astronomy made copies of the 1608 version of Ricci's *Complete Map of Ten Thousand Countries of the World* and Schall von Bell's star chart. King Sukchong promoted possession of knowledge of astronomy and calendar-making as important vehicles to strengthen royal power.

At the court of Yŏngjo 英祖 (r. 1724-76), several large-format folding screens after the Kögler's astronomical charts were commissioned. This reflects the increased interest in Western astronomy and calendar as well as the influence of the Western books on astronomy that were imported into Korean without delay in the eighteenth century. Among many sources, Kögler's two treatises on astronomy - *Two General Maps of the Stars Relative to the Ecliptic* (*Huangdao zong xingtu* 黃道總星圖) in 1723 and *Compendium of Calendrical Science and Astronomy* prefaced by the Emperor Qianlong in 1757 - served

8 In 1645, shortly after the first Qing emperor came to the throne, Schall von Bell was asked to make a new calendar, which he based on the 1635 calendar that he had presented to the last Ming emperor.

9 Discrepancies between the locally produced Chosŏn version and the one that was based on the new Qing calendar system might have caused serious diplomatic problems.

10 Astronomers were dispatched to Beijing almost every two years on average; however, it is noted that the frequency of astronomy missions increased sharply in the mid-eighteenth century. Due to frequent changes in the Qing calendrical system, Chosŏn astronomers attempted to contact the Jesuit astronomers of the Imperial Bureau of Astronomy to keep the Korean calendar in accordance with the ever-changing Qing astronomical system.



as important models for the Chosŏn copies. The 1723 star map was considered a physical and symbolic representation of the ‘order’ of time and space and an important visual arbiter between Western scientific knowledge and Qing imperial authority under the new Yongzheng emperor (1722-35) (Pegg 2019, 48).

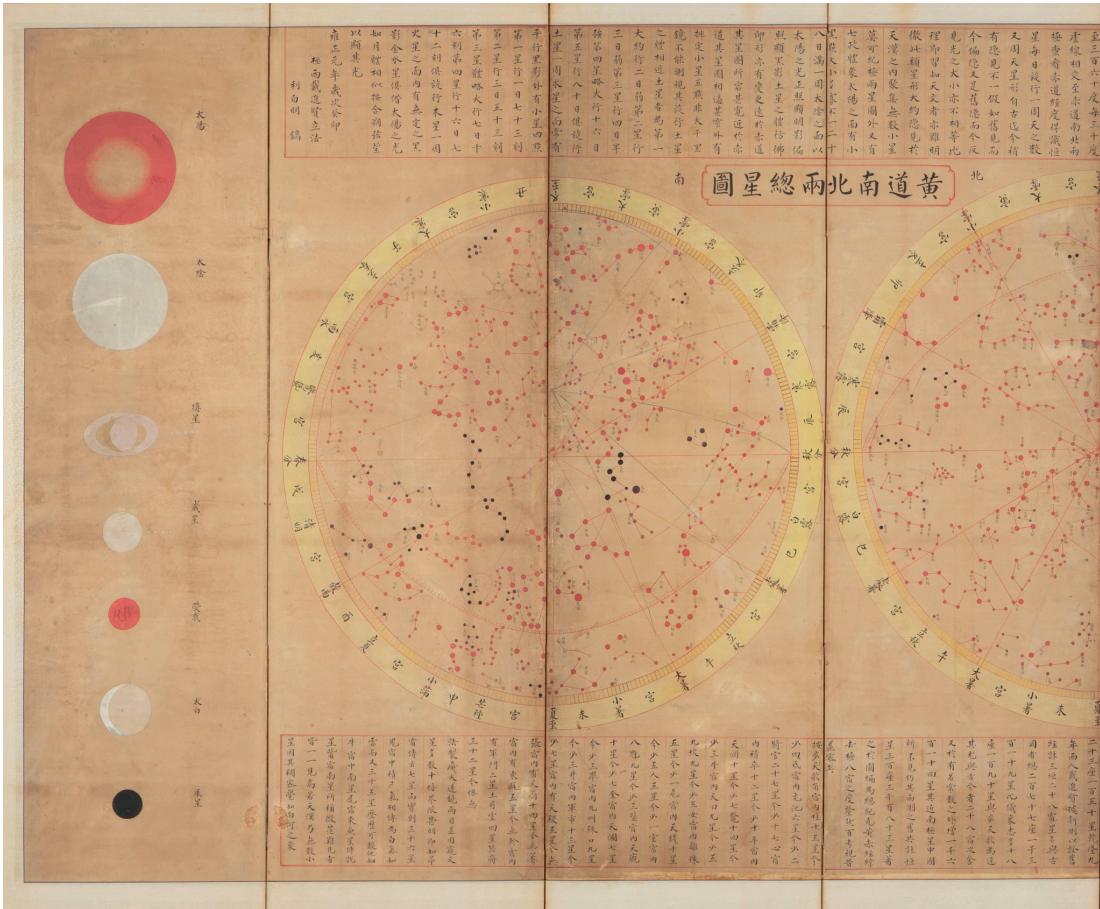
Korean envoys visiting Beijing were well aware of Kögler’s accomplishment in calendrical science and astronomy and befriended him during their stay in Beijing. In 1742, An Kuk-Pin (1699-?), an official in the Royal Bureau of Astronomy, met with Kögler and then-vice-director Antonio Pereira and received books on astronomy. An Kuk-Pin’s encounters with Kögler resulted in the production of the eight-panel folding screen in Pöpchu Temple known as *Improved Methods Star Charts* (*Sinböp ch’önmundo* 新法天文圖). This was created by the commission of King Yöngjo to copy Kögler’s 1723 *Huangdao zong xingtu* in 1742 (Yi 1966). The first panel bears a long introductory text and diagrams of the Seven Directors which were derived from Kögler’s



Figure 5 Old and Improved Methods Star Charts. Mid-eighteenth century. Eight-panel folding screen, ink and color on paper, 108.5 × 206.5 × 30.2 cm, National Folk Museum of Korea (Folk 15666)

map. The six panels from the second through the seventh includes two large-scale star charts along the ecliptic poles of the northern and southern hemispheres. The last panel presents the names and titles of six court officials, including An Kuk-Pin and other officials of the Royal Bureau of Astronomy, who were involved in the project. Although these screens are deeply indebted to its Western model in terms of the contents and compositions of the texts and diagrams, the large-scale multi-panel screen format accompanied by a list of the relevant officials' names solely belongs to the indigenous tradition. Inclusion of the list of participants with their official titles follows the standard format of documentary painting commissioned by the government office called *togam* (都監) in the late Chosŏn dynasty (Seo 2020, 183-6).

Kögler's 1723 star map was copied again during the reign of King Yŏngjo. The star catalogue and related astral charts titled *Yixiang kaocheng* (1757) and Verbiest's work, *Description of Astronom-*



ical Instruments (Yixiang zhi 儀象志, 1674), provided the most advanced astronomical knowledge to Chosŏn astronomers in making the Chosŏn version known as the *Old and Improved Methods Star Charts* (*Singubŏp ch'ŏnmundo* 新舊法天文圖), an eight-panel screen dated around 1766 (An 2013). Interestingly, Chosŏn copies combines the traditional Chinese constellation chart called *Positions of the Heavenly Bodies in Their Natural Order and Their Allocated Fields* (*Ch'ŏnsang yŏlch'a punyajido* 天象列次分野之圖) with Kögler's star atlas of 1723 on a large standing multiple folding screen. The juxtaposition of the old Chinese star chart alongside the new Jesuit star map on a single screen is a rare case only found in mid-eighteenth centu-

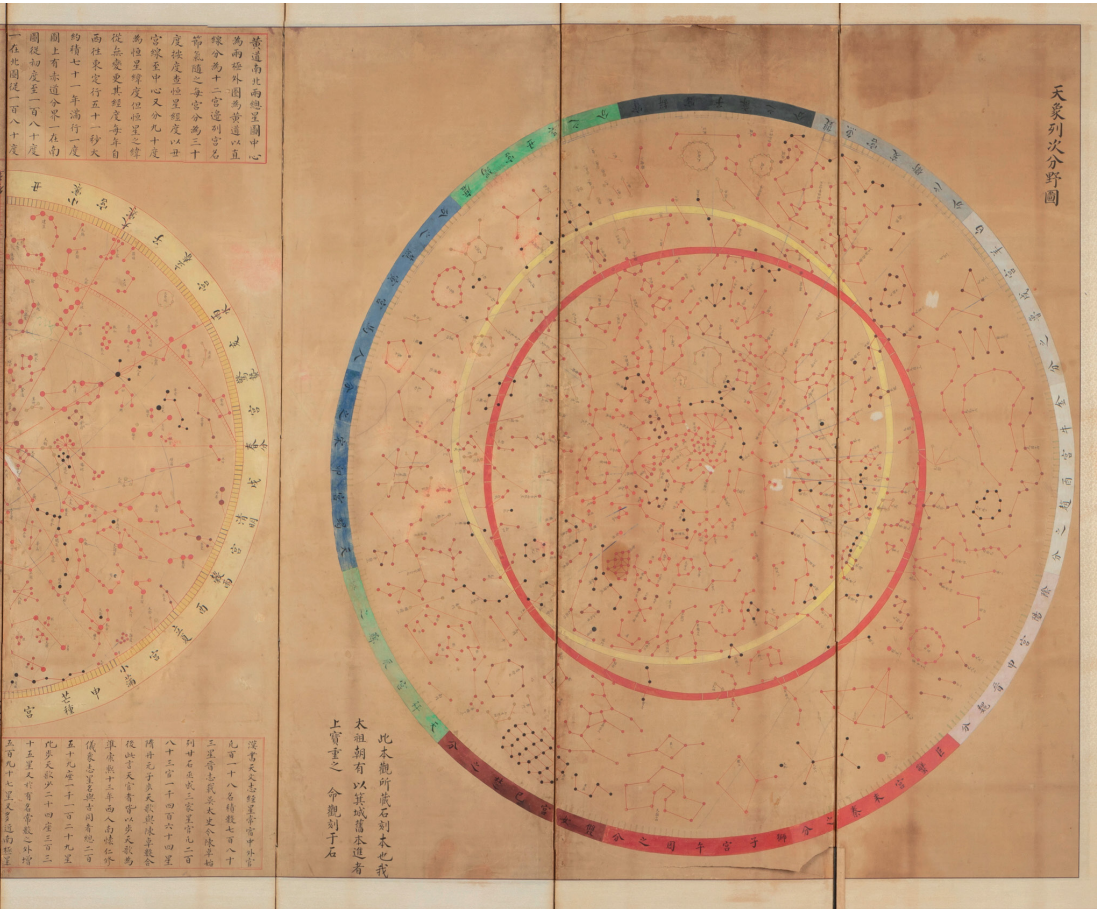
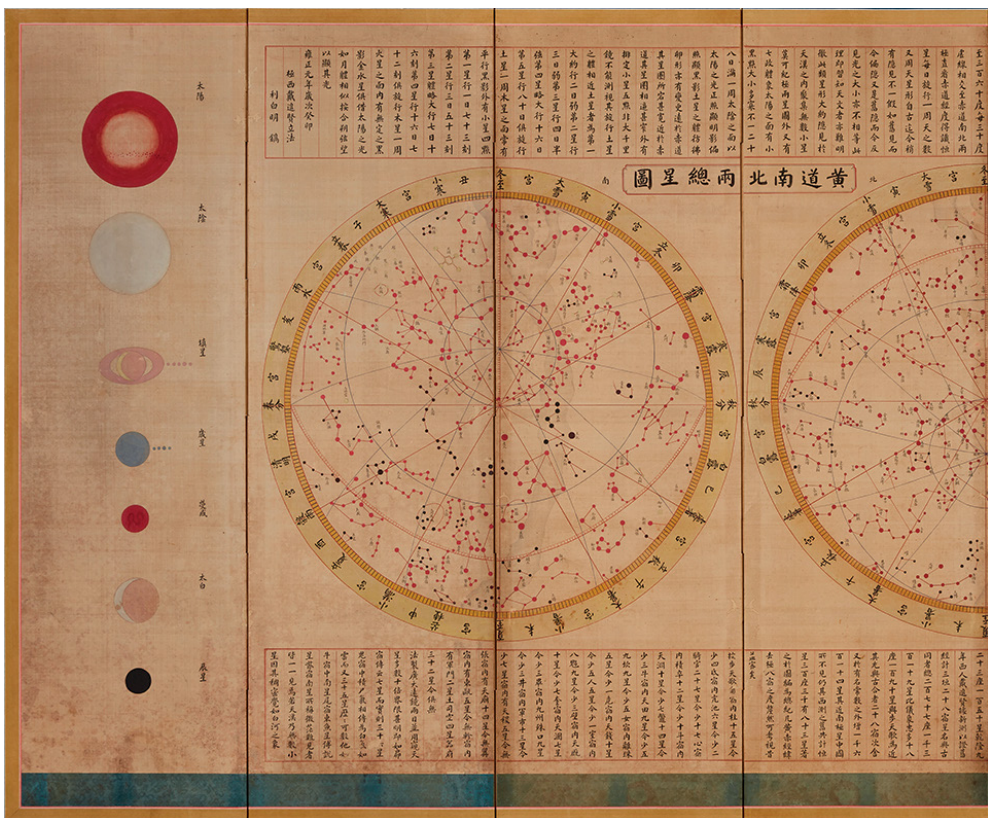


Figure 6 Old and Improved Methods Star Charts. Mid-nineteenth century. Eight-panel folding screen, 230 × 448 cm. National Folk Museum of Korea (Folk 70195)

ry Chosŏn, Korea. This pictorial program is related to King Yŏngjo's political and ritual intention to use the star atlas as a symbol of royal authority and legitimacy.

Ch'ŏnsang yŏlch'a punyajido was a stele originally made by King Taejo in 1395 to show the classical Chinese constellations and demonstrate the principles of Chinese astronomy. Later the reproduction was engraved into a block of marble in 1687 under the auspices of King Sukchong [fig. 4]. The badly damaged stele of 1395 which had been left unattended at Kyŏngbok Palace was moved to the Changdŏk Palace to be preserved with King Sukchong's copy in a newly built pavilion named Hall of Respectable Veneration (*Hŭmgyŏnggak* 欽



敬閣) by the order of King Yǒngjo in 1770 (Mun 2004, 35). The stele was valued mainly as an historical relic for its symbolic importance, not for its scientific merits. King Yǒngjo's *Record on Pavilion of Respectable Veneration* (*Hŭngyǒnggaki* 欽敬閣記), dedicated to the newly built pavilion, confirms the symbolic and political significance of this event. The king made the most of his opportunity to associate the previous kings' accomplishments with his own and thus to augment the legitimacy that he inherited from King Taejo through Sukchong. King Yǒngjo's apt use of previous rulers' legacy and his pronouncement of pursuing antiquity and succeeding former kings' accomplishments were more than mere rhetoric. To strengthen his legitimacy, which had been inherently damaged by his mother's un-noble birth and challenged by rebellion, King Yǒngjo emphasized

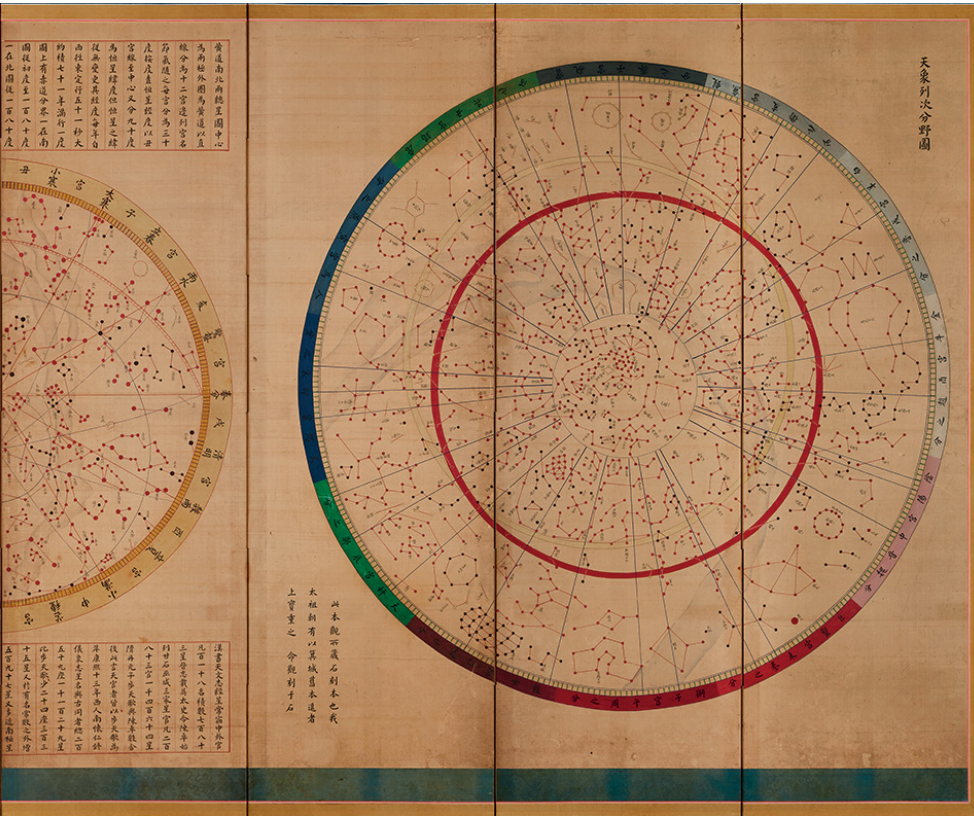


Figure 7 Old and Improved Methods Star Charts. Late nineteenth century. Eight-panel folding screen, ink and color on silk, each panel 170.3 × 55.7 cm. Jeonju National Museum of Korea (Deoksu 1218)

his close association with previous rulers - particularly his father, King Sukchong - by emulating his accomplishments and following in his footsteps (Kim 2005). This was evident in King Yŏngjo's organization of numerous court events and ceremonies reminiscent of those of King Sukchong, such as the ritual of admission to the Office of Statesmen of Venerable Age in 1744, a congratulatory ceremony at Sungjŏng Hall 崇政殿 in 1763, and the reprinting and distribution of the *Record to Celebrate the Glory of the State* (*Kwangguk chigyŏngnok* 光國志慶錄) (Pak, Kim 2007).

Ch'önsang yölch'a punyajido depicted on the three panels to the far right is closer to that in the 1687 version than to that in 1395. However, the short inscription on the first panel links its origin back to the 1395 stele and explains that the star maps were offered to

King Taejo by the people of Pyongyang. Such archaic representation of constellations was required to verify its historical authenticity and origin, not to fulfill any responsibility in the field of natural science. Notable errors in the visibility of constellation and misplaced stars caused no serious problems in as far as the antique star charts attested to the legitimacy of the King Taejo, the dynastic founder (Stephenson 2008, 567-8). Two concentric circles represent the northern circumpolar boundary and the celestial equator, respectively. The ecliptic-colored yellow is incorrectly shown as a circle, and the boundaries of the twenty-eight lunar lodges are represented by lines extending from the north circumpolar circle to the rim of the chart. The stars are shown in three colors - red, blue, or yellow - according to Chinese tradition. The Milky Way is clearly depicted in light blue color.

The two large hemisphere charts on panels 4 through 7 employ the structure and texts of Adam Schall von Bell's star chart of 1634 and again used by Kögler in 1723. The same three colors were used for the stars and followed the Chinese constellation configurations as in the 1395 chart. In contrast to the tradition of East Asian maps, the Kögler's chart was drawn with polar stereographic projection from the north-south ecliptic pole to the ecliptic. The inscription above the planispheres resembles Kögler's charts of 1723 with minor changes. This passage bears the date of 1723, the first year of the Yongzheng's reign of the Great Qing dynasty, and the names of two Jesuit astronomers, Dai Jinxian 戴進賢 (Kögler) and Li Boming 利博明 (Ferdinando Bonaventura Moggi, 1684-1761). The lower inscription attests to a history of classical Chinese star charts along with the Jesuit's contributions, and the use of telescope to observe stars accurately. The last panel bears diagrams of the Seven Directors.

Seven versions of this star chart in a large-screen format survive today, all of which are decorative and beautifully colored (Na 1998; Needham 2004; O 2020). These *Old and Improved Methods Star Charts* are held in Whipple Museum of History of Science, two in National Folk Museum of Korea [figs 5-6], Nanban Bunkakan Museum, National Diet Library of Japan, Jeonju National Museum of Korea [fig. 7], and a K-auction in Seoul (O 2020, 354). Among the copies, maps in the collections of Whipple Museum of History of Science and the National Folk Museum of Korea were dated to circa 1766, based on their scientific analysis of pigments and bibliographic study.¹¹ The

11 The screen of the National Folk Museum of Korea (Folk 15666) was painted with only traditional pigments such as azurite, indigo lake, malachite, atacamite, vermilion, iron oxide, cochineal, gamboge, orpiment, lead white, talc and soot. The work in the National Diet Library of Japan was painted with traditional and artificial inorganic pigments together. For its green and blue colors emerald green and ultramarine blue were used together with atacamite and indigo lake, respectively. These artificial pig-

screen in National Folk Museum of Korea (Folk 1566) is painted on a conspicuous eight-panel folding screen, approximately each panel measuring approximately 55.5 × 169.5 cm, and combines two star charts derived from Eastern and Western traditions, respectively. Stars are represented by red, yellow, or black dots and linked into named constellations by straight red lines.

All the Chosŏn screens of heaven and earth discussed in this study are stunning and impressive in their rendition and scale as they were commissioned by the king and intended to be placed in the royal court as agents of royal authority over the 'order' of time and space. Visually juxtaposing an old star chart reminiscent of the dynastic founder's legacy with an up-to-date map from the Qing on a large-format screen visually confirmed King Yŏngjo's legitimate succession and strong sovereignty. For King Yŏngjo, these screens were important visual vehicles to identify himself as legitimate successor of the throne and would be displayed during royal ceremonies to assert the 'order' of the realm and affirm the his rulership that he had inherited from the glorious past (Pegg 2019).¹² The political significance of star charts is also evidenced by the fact that a celestial map was offered to the crown prince just after the royal investiture ceremony (Yi 2001). These screens not only provide important evidence for the transmission of Jesuit science from China as part of Korea's acquisition of astronomic knowledge in the eighteenth century but also played a significant role in strengthening royal authority around the calendar and conceptions of space and time more broadly.

It is an exceptional phenomenon that the Korean court primarily produced terrestrial and celestial maps in the format of large-scale folding screens while their neighboring countries, China and Japan, employed various formats such as wall-hanging scrolls or printed in books. Why did the screen, a somewhat obsolete tradition in the contemporary art of East Asia, appear as a favorable format for maps in Korea? What was the intention or purpose of this peculiar format in the Chosŏn court? By nature, commissioning a screen entailed much higher costs than a hanging scroll or an album; furthermore, a screen offered more conspicuous or public display and monumental-

ments were imported from Europe after the mid-nineteenth century. By contrast, the screen of the National Folk Museum of Korea (Folk 70195) used only artificial inorganic pigments for its green and blue colors. Based on pigment analysis and close examination, the star charts were painted after the mid-eighteenth century. Considering that the screens of the National Diet Library of Japan and National Folk Museum of Korea (Folk 70195) used artificial Western pigments, both can be dated after the mid-nineteenth century, later than the screen of the National Folk Museum of Korea (Folk 15666).

12 Richard Pegg interprets the juxtaposition of the old and new star charts as a unique perspective on time and space found in China. According to his argument, posing "'then' a former/old visual presentation of celestial and terrestrial worlds and 'now' new Western-based presentations" side by side was a recurring phenomenon in East Asia.

ity to its viewers. For this reason, the most privileged patrons such as royalty and government agents preferred the screen in their commissions for official occasions as the most suitable medium to display their social prominence and propagate their political agendas. For this reason, many documentary paintings sponsored by kings and the government were rendered in screen-format since the King Yōngjo's reign (Seo 2020).

Considering the ritual functions and significance of the screen format in the Chosŏn court, we can assume that these maps played a symbolic role. In Korea, screens were used both inside and outside the palace to create backdrops for ceremonies and to document court rituals, government projects, ceremonies, palace banquets, birthday celebrations, and royal processions. The large-format folding screen was the preferred and primary format for conspicuous displays of royal authority, forming an essential part of the backdrop for official governance and political power and serving as a manifestation of the cosmological order of the Chosŏn royal court (Pegg 2019, 51). The large-scale, multi-panel screen was an ideal format to maximize the magnificence of the motifs and to display political supremacy.

5 Conclusion

Maps of the world and heavens themselves challenged Chosŏn Koreans' world view and brought about epistemological turns while at the same time being used to demonstrate the dynasty's cosmic legitimacy, to represent power, and to symbolize hierarchical order. Among Chosŏn intellectuals, they aroused curiosity about the world outside of Sino-centric perspectives, inviting further discussion on the nature, science, and religions departing from traditional values. Increased exposure to the European knowledge and information that was imported along with the world maps and star atlases in the late Chosŏn period opened the eyes of Chosŏn Confucian scholars to Western learning as well as Northern Learning (*pukhak* 北學) with their recognition of the Qing cultural achievement. The interest in Western Learning and the positive evaluation of the Qing civilization changed Korean scholars' attitude toward the Qing and its culture, which Koreans had for centuries looked down upon as 'barbarians'.

Thus, Jesuit world maps and astronomical charts not only brought about scientific changes in the Chosŏn society, but also connected the Chosŏn to the larger global network of transmission of knowledge and information. Examining the origins, development, and transformation of the animal motifs in particular, elucidates the interchange as well as to the (mis)perception of Western pictorial techniques, motifs, and styles. The imported knowledge was used to produce Chosŏn version of celestial and terrestrial maps, combining indigenous tradi-

tion with new Sino-European techniques. The king and Chosŏn court played an important role as agents in the transmission and domestication of these foreign maps. The Jesuits' explanations of the structure of heaven and earth were slightly filtered through adjustments to traditional astronomical conventions. More importantly, they were framed on screens, a long-standing tradition of the Chosŏn dynasty. In later periods, the Western maps and star charts circulated more widely beyond the court, providing abundant resources for mapmakers and literati scholars to pursue their intellectual interests in cartography and astronomy.

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