

Learning “Western” Astronomy from “China”: Another Look at the Introduction of the *Shixian li* 時憲曆 Calendrical System into Late Joseon Korea*

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Soon after the Qing 清 dynasty (1636–1912) promulgated the Jesuit-crafted *Shixian li* 時憲曆 in 1644 as its official calendrical system, the Joseon (朝鮮, 1392–1910) court launched a project to master the methods of the new Jesuit astronomy. For over a century thereafter, the Joseon court dispatched a series of official missions to Beijing to acquire astronomical texts and instruments, or to learn calculation methods directly from the Jesuits and other Qing astronomers in the Imperial Bureau of Astronomy (*qintian jian* 欽天監).

Previous research by Korean historians has treated this episode mostly under the rubric of the introduction of Western science in the late Joseon period. At first glance, this seems obvious, since the *Shixian li* system was based upon European astronomical models, Tychonic in particular, which had been introduced into China by Western missionaries. In emphasizing the term “Western,” however, Korean historians had a more serious concern. Under the ideological imperative of national modernization that prevailed among Korean intellectuals of the twentieth century, Korean historians found in this late Joseon episode an earlier phase of the modernization of Korea, specifically a process by which pre-modern Koreans were converted from “medieval Chinese” to “modern Western” sciences. Ironically, according to this perspective, the tributary missions of the Korean envoys to Qing China, allegedly the main route by which Western science and Christianity were brought into Joseon society, were in fact a route that led the Koreans from China to Western modernity. The cultural resources of Qing China were regarded as historically meaningful only when they were proved to have contained elements related to the West.¹

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This paper questions this “West-oriented” account of previous scholarship and attempts to restore the so-far belittled position of the “China factors” in the historiography of science in late Joseon Korea.² Toward these ends, this paper relocates the late Joseon episode of learning Western astronomy into a more proper historical context—the politico-scientific relations of the Qing and Joseon dynasties. Contrary to the previous accounts that have portrayed this episode as the turn of the Koreans’ interest from Chinese to Western science, the late Joseon project to learn Western astronomy might better be viewed as an attempt to introduce the astro-

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¹ The first serious ‘modernistic’ account of the introduction of Western science into late Joseon Korea was provided by Hong Iseop 洪以燮 in his *Joseon gwahaksa* 朝鮮科學史 [A history of science in Korea] (Seoul: Jeongeumsa, 1946); reprinted in *Hong Iseop jeonjip* 洪以燮全集 [The complete works of Hong Iseop] (Seoul: Yonsei University Press, 1994), vol. 1, 1–302. In this account, Hong titled the part devoted to science in the late Joseon period as “The Introduction of Western Science and the Rejection (*jiyang* 止揚) of Medieval Science” (*ibid.*, 257–261). Hong’s emphasis on “Westernization” was widely accepted and repeated by later historians, whose main aim of research was to find the “sprouts” of modernity in the late Joseon period. Kim Yung Sik, “Problems and Possibilities in the Study of the History of Korean Science,” in Morris Low, ed., *Beyond Joseph Needham: Science, Technology, and Medicine in East and Southeast Asia*, *Osiris* 13 (1998), 48–79, provides a comprehensive review of the historiography of Korean science in the twentieth century.

² This article uses the term “China” as a rough translation of the term *Jungguk* (*Zhongguo* 中國 in Chinese), which might better be translated as “the Middle Kingdom.” When the literati elites of the Joseon period used the term *Jungguk*, it had two different meanings, which in their usages often overlapped. On the one hand, *Jungguk* was used as a generic term to refer to specific ruling dynasties of China, such as the Ming dynasty (*Myeongguk* 明國). In this aspect, *Jungguk* was understood by the Koreans as a neighboring polity of great power and splendid culture—a politico-cultural entity that the Koreans unavoidably had to engage with, albeit on unequal political terms, in order to enhance their own benefits in political, economic, and cultural matters. On the other hand, the Koreans very often used the term *Jungguk* to refer not to any specific dynasty, but rather to a “culture” of universal values, which was nevertheless considered as having a specific origin in the ancient “central plain” (*jungwon, zhongyuan* 中原 in Chinese) area. In this usage, *Jungguk* represented a noble legacy from the ancient Confucian sages, and was viewed not as something foreign to the Koreans, but as a culture in which Joseon and its literati elites were entitled to be legitimate participants—or even the *only* participants after the collapse of the Ming, which was alleged to be the last “Chinese” dynasty. When this article uses the term “China,” it means this complex entity as viewed and appropriated by Korean literati-officials. In this sense, the article does not intend to replace the previous “Euro-centric” assumption with another kind of “centrism,” in this case “Sino-centrism,” in which China is viewed as a metropolitan center from which its culture spread out, by its inherent superiority, to less civilized areas. About the complex implications of the term *Jungguk*, a useful overview, albeit dealing with the cases in Chinese history, is provided in Yi Seonggyu 李成珪, “Junghwa sasanggwa minjok juui” 中華思想과 民族主義 [Sinocentrism and nationalism], in Jeong Mungil et al., eds., *Dong Asia, munjewa sigak* 東아시아, 問題와 視角 (Seoul: Munhakgwa jiseong sa, 1995), 107–53.

nomical system of a new ruling dynasty of continental China.³ The Qing-Joseon politico-cultural relations, this paper argues, provided the Joseon court with the basic motive for its attempt to adopt Western astronomy. The actual process of the astronomy project, including its timing and the ways of carrying out its efforts, was also conditioned by the ever-changing features of the Qing-Joseon relationship. Finally, the Qing-Joseon relationship was not a mere “external” factor that only accelerated or inhibited the government astronomy project: it also played a role that might be called epistemological, in the sense that it fundamentally shaped how astronomers and literati officials at the Joseon court viewed the “outer worlds”—the world of stars as well as that of another culture called “the West.”

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Western astronomy became an important subject for the Koreans to study because it was the official calendrical system of a new ruling dynasty of the Chinese continent. In other words, the late Joseon project of introducing Western astronomy was driven not so much by the pure intellectual curiosity of the Koreans about new Western science as by an urgent practical need of the Joseon court to keep its calendrical system in accordance with that of the Qing dynasty.

This practical motive of the project is evident in, more than anything else, the timing of the major attempts of the Joseon court to adopt the *Shixian li* system. Particularly illuminating in this respect was the first attempt, which was made in the mid-seventeenth century. Official court documents of the dynasty show that Korean interest in Western astronomy suddenly grew after Qing’s adoption of the *Shixian li* system in 1644, and that this interest lasted for less than a decade. By the early 1650s, astronomers of the Royal Bureau of Astronomy (*gwansang gam* 觀象監) had mastered the basic methods of the new calendrical system, and thus the Joseon court, from the fifth year in king Hyojong’s 孝宗 reign (1654), was able to issue its own official calendar according to the *Shixian li* system.

Even though it was known to Korean society from as early as the beginning of the seventeenth century, Western Learning, including astronomy, failed to recruit a

³ For approach in this article I am much indebted to Kim Yung Sik’s 金永植 critique of the nationalist historiography of Korean researchers in the twentieth century. In what he terms “the problem of China in Korean history,” Kim questions Korean historians’ persistent search for “something uniquely Korean,” which they thought had enabled the development of a Korean science that was distinct from, or even “independent” of, the influence of Chinese metropolitan science. Kim attempts to correct this historiographical bias by pointing out “the omnipresence of Chinese scientific ideas and artifacts” in traditional Korean science and technology. He points out, for example, that even the transmission of Western science to late Joseon Korea could be viewed as a “continuation of the transmission of science from China that had already been going on for many centuries.” See Kim Yung Sik, “Problems and Possibilities,” 61–63. See also idem, “The ‘Problem of China’ in the Study of the History of Korean Science: Korean Science, Chinese Science, and East Asian Science,” *Gujin lunheng* 古今論衡 18 (2008), 185–98.

considerable number of supporters from the court and the general intellectual society in the first half of the seventeenth century. Although Western Learning achieved dramatic advancement in contemporary China, culminating in the Astronomical Reform of the Chongzhen 崇禎 period led by Xu Guangqi 徐光啓, it remained marginal in the intellectual scene of Joseon society.⁴ Korean intellectuals were generally indifferent, if not hostile, to the new foreign learning. Even in a few exceptional cases, in which individual literati showed some interest in Western Learning, they treated it at best as passing exotica from remote Western countries. For instance, when a Korean envoy named Jeong Duwon 鄭斗源 presented to the court a telescope, a mechanical clock, and a small Western cannon that he had received from João Rodrigues in his 1631 mission to Ming China, the response from the court was not wholly positive. Although the king, who appreciated the value of the gifts, especially of the Western cannon, issued an order that Jeong be promoted to a higher rank, many officials resisted the royal order, discounting the Jesuit's gifts as "mere strange things that are mostly of no practical use."⁵

The situation changed suddenly when the Qing dynasty promulgated the Jesuit-made *Shixian li* as its official calendrical system. As is well known, Adam Schall von Bell, upon Qing's occupation of Beijing in 1644, presented to the Shunzhi 順治 emperor the astronomical treatises that Xu Guangqi had submitted to the Ming Chongzhen emperor a decade before. On the basis of these treatises, now newly titled the *Treatises on Calendrical Astronomy according to the New Western Method* (*xiyang xinfā lishu* 西洋新法曆書), the Qing promulgated the *Shixian li* calendar for the second year of the Shunzhi reign period (1645–46).⁶ Soon, the news of the Qing's astronomical reform became known to the Joseon court. In 1645, the *Shixian li* calendar, with several introductory books on Western astronomy, was brought to Korea by the envoys returning from their Beijing missions. Subsequently, some court officials, including the prime minister of rites Kim Yuk 金堉, submitted memorials to the throne that emphasized the urgent need to adopt the new Western system employed by the Qing. To do this, Kim Yuk argued, the court had to dispatch professional astronomers to Beijing to learn how to calculate ephemeris-

⁴ About the astronomical reform in the Chongzhen reign period, see Hashimoto Keizo, *Hsü Kuang-Ch'i and Astronomical Reform: The Process of the Chinese Acceptance of Western Astronomy 1629–1635* (Osaka: Kansai University Press, 1988), 7–73.

⁵ *Seungjeongwon ilgi* 承政院日記 [The daily records of the royal secretariat], hereinafter *SJWIG*, Injo 仁祖 09 (1631–32)/07/12 and 07/13. The electronic texts of the *SJWIG* are available on the official website of the National Institute of Korean History, <http://sjw.history.go.kr>. Another source shows that, in addition to the above-mentioned three gifts, Jeong also received from the Jesuits several books on astronomy and geography, a star atlas, and a world map. See *Gukjo bogam* 國朝寶鑑 [The precious mirror of our dynasty], gwon 35, Injo 9 (1631–32), 17b–18a. I have used the electronic image version of the text provided by the Database of Korean Classics, Institute for the Translation of Korean Classics, <http://db.itkc.or.kr/itkcdb/mainIndexIframe.jsp>.

⁶ Catherine Jami, *The Emperor's New Mathematics: Western Learning and Imperial Authority during the Kangxi Reign (1662–1722)* (Oxford: Oxford University Press, 2011), 35–37.

des according to the new method.⁷ Learning Western astronomy became one of the top priorities of the Joseon court.

This sudden shift of the court’s attitude can be understood in the context of Sino-Korean political relations, in which calendrical astronomy had for many centuries played an important role.⁸ According to the age-old Sino-Korean tributary relations, Joseon, considered as a tributary state of the Chinese empire, was supposed to use the calendar decreed by the imperial court. In fact, it had been an established ritual that Joseon kings would dispatch to the Chinese imperial court annual envoys whose assignment was to receive the next year’s calendar, as issued by the Imperial Bureau of Astronomy. This ritual of receiving calendars, known as *zhengshuo* 正朔, symbolized the Joseon king’s submission to Chinese imperial power, which by issuing the imperial calendar set out the rhythm of the people’s lives “all under the heaven.” Seen from this politico-ritual function of astronomy in regulating the hierarchical relations of the two countries, the Ming-Qing dynastic change and the latter’s adoption of a new calendrical system signaled that it was time for the Joseon court, now forced to serve the Qing dynasty, to change its official astronomy from the *Datong li* 大統曆 of the previous dynasty to the *Shixian li*, a calendrical system that was to regulate the new imperial world order.⁹

Characterizing the *Shixian li* as a new Chinese calendrical system constituted the main rationale of the Joseon court and its officials for adopting Western astronomy. In his proposal to adopt the *Shixian li* system, Kim Yuk positioned Western astronomy at the end of a long sequence of official calendrical systems in Chinese history, from that of the ancient sage rulers to the *Shoushi li* 授時曆 of the Yuan dynasty

⁷ Proposals by Han Heung-il 韓興一 and Kim Yuk are recorded in *Joseon wangjo shillok* 朝鮮王朝實錄 [The veritable records of the Joseon Dynasty], hereinafter *JWS*, Injo 仁祖 23 (1645–46)/06/03 (Han Heung-il) and Injo 23/12/18 (Kim Yuk). The electronic texts and images of the *JWS* are available at the official website of the National Institute of Korean History, <http://sillok.history.go.kr>.

⁸ For a general survey of the Sino-Korean tributary relation in the Qing period, see Chun Haejong [Jeon Haejong 全海宗], “Sino-Korean Tributary Relations in the Ch’ing Period,” in John K. Fairbank, ed., *The Chinese World Order: Traditional China’s Foreign Relations* (Cambridge, MA: Harvard University Press, 1968), 90–111; idem, “Cheongdae hanjung jogong gwangye go” 清代韓中朝貢關係考 [A study on the tributary relations of Korea and China in the Qing period], *Hanjung gwangye sa yeongu* 韓中關係史研究 (Seoul: Iljogak, 1970), 59–112.

⁹ It was as a result of the Qing’s military campaign in 1637 that Joseon became its tributary state. From then on, Joseon officially received calendars from the Qing instead of from the Ming court, as shown in several records in *JWS*. Yet, because Qing’s calendar was, according to the Joseon court astronomers’ view, almost the same as that of the Ming, the Joseon court continuously relied on the old Ming astronomical method. See, for example, *JWS*, Injo 17 (1639–40)/04/27. About the issues of calendrical astronomy at the Joseon court in the period of Ming-Qing dynastic change, see, Jun Yong Hoon [Jeon Yonghun 全勇勳], “Joseon hugi seoyang cheonmunhakgwa jeontong cheonmunhagui kaldeunggwa yunghwa” 朝鮮後期 西洋天文學斗傳統天文學의 葛藤과 融和 [The conflict and fusion between Western and traditional astronomy in late Joseon Korea] (PhD Thesis, Seoul National University, 2004), 12–20.

(1271–1368). Periodic reforms of the astronomical system were unavoidable, Kim argued, because any astronomical system, including even the *Shoushi li*, allegedly the best system ever made in Chinese history, was destined to accumulate discrepancies from the celestial phenomena themselves. After having been used for a long time, therefore, the aged system had to be replaced by a new one, in order to readjust the calendar with the heavens. Since the preceding *Shoushi li* system had been used for more than three hundred years, Kim concluded, it was the right time for calendrical reform, and “the calendrical astronomy of the West appeared just at the time when it was badly needed” (*seoyang ji ryeok jeokchul eo chasi* 西洋之曆, 適出於此時).¹⁰

Up to this point, Kim’s justification for adopting Western astronomy seems to be only a mere repetition of the stereotypical plea for calendar reform, which had been recurrent at major moments in the history of Chinese astronomy, particularly Xu Guangqi’s call for reform, presented to the Chongzhen emperor in the late Ming.¹¹ Yet, Kim Yuk soon revealed his awareness that the Joseon court was not entitled to carry out its own calendar reform, independently of China. Once China had changed its astronomy, what the Joseon court had to do was only to adjust its own calendar to the new imperial one. He thus argued, “Since the Middle Kingdom (*Jungguk* 中國) changed the calendrical system in around the *byeongja* 丙子 and *jeongchuk* 丁丑 years (1636–37), the calendar [of the Middle Kingdom] for the next year would possibly show big discrepancies from that of our Kingdom. If the new calendrical system was proved to show fine correspondence to the heaven, we must throw the old away and adopt the new.”¹² Kim Yuk was in fact formulating what might be called a “localized” version of the proposal for a calendar reform. In this case, the perceived issue was more about adjusting the local calendar to the new imperial one than to the heavenly phenomena per se.

The proposal for a “local” calendar reform, as was presented by Kim Yuk in the mid-seventeenth century, was not something entirely new in Korean history. Although Kim in his memorial did not exhibit any historical awareness, the effort of the Koreans to adopt Chinese astronomical systems was a well-established tradi-

¹⁰ *JWS*, Injo 仁祖 23 (1645–46)/12/18. Kim Yuk’s list of Chinese astronomical systems did not include the *Datong li* system of the Ming dynasty, perhaps because he thought it was only a minor variant of the *Shoushi li* system in a technical sense.

¹¹ For Xu Guangqi’s proposal for the Chongzhen calendar reform, see, Hashimoto, *Hsü Kuang-Ch’i*, 7–73. Nathan Sivin, “Cosmos and Computation in Early Chinese Mathematical Astronomy,” *T’oung Pao* 55 (1969), reprinted in Sivin, *Science in Ancient China: Researches and Reflections* (Brookfield, VT: Ashgate, 1995), chapter 2 discusses the earlier precedence of the plea for astronomical reforms in later Han dynasty China, which was to be repeated throughout the history of astronomy in China.

¹² *JWS*, Injo 23 (1645–46)/12/18. Kim’s concern about impending discrepancies between the calendars of Qing and Joseon was based upon his awareness that Qing had changed its calendar “in 1636 and 1637.” Although it is correct that Qing had promulgated its own calendar from 1637, the Qing adopted the *Shixian li* in 1644, only one year before Kim’s presentation of the memorial. At this moment, perhaps, there was some confusion, or lack of information, among the Koreans about the process of the Qing’s adoption of the *Shixian li* system.

tion in the history of astronomy in Korea. A prominent precedence was that of the fourteenth and fifteenth centuries, in which the court of Goryeo (高麗, 918–1392) and Joseon dynasties made strenuous efforts to learn the *Shoushi li* and its technical variant, the *Datong li* systems. The “local” calendar reform, which was formulated by Kim Yuk as something incidental to that of China, had therefore its own history, which was roughly in parallel with the history of astronomical reforms in China. The late Joseon Koreans began to show their awareness of the history of “local” calendar reforms as late as the mid-eighteenth century. It found its most clear expression in a chronology of Korean calendrical astronomy (*yeoksang yeonhyeok* 曆象沿革) written by Seo Hosu 徐浩修, a prominent literati astronomer of the late eighteenth century, for an official encyclopedia of the Joseon dynasty. In this work, Seo put the late Joseon effort to introduce the *Shixian li* astronomy under the long and continuous tradition of the Koreans’ adoption of Chinese calendrical systems from remote antiquity—beginning with Shilla’s (新羅 57 BCE–935) use of the *Linde li* 麟德曆 of the Tang dynasty, Goryeo’s conversion from the *Xuanming li* 宣明曆 of the Tang to the *Shoushi li* of the Yuan, through King Sejong’s project to master the *Shoushi li* method in the early Joseon period.¹³

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If the “local” calendar reforms to be carried out by the Joseon court were fundamentally conditioned by the Sino-Korean political relationship and thus were considered incidental to the calendar reforms in China, this does not mean that the Joseon court had only to reissue for local use the new Chinese calendars as were granted by the imperial court. The “tributary” ritual of receiving Chinese calendars did not exempt the Joseon court astronomers from the need to master the Chinese method of astronomical calculation and observation. The local calendar reform had, therefore, its own technical dimension as well.

Generally speaking, the Joseon court had two reasons for its attempt to acquire the techniques of calendar making according to Chinese methods. First, Korean kings promoted professional astronomy as an important means to legitimize their rule over their own kingdom. This was, for example, one of the main motives behind King Sejong’s ambitious promotion of calendrical astronomy in the early fifteenth century. As a new ruling dynasty of the “Eastern State,” the Joseon court of the period made strenuous efforts to install its own institutions of Confucian gov-

¹³ In his chronology, Seo Hosu includes Kim Yuk’s memorial as a significant event that marked the beginning of the late Joseon project to learn the *Shixian li* system. Hong Bonghan 洪鳳漢, et al., eds., *Jeungbo munheon bigo* 增補文獻備考 [Collected documents of the eastern kingdom, an enlarged edition], *Sangwi go* 象緯考 [Treatise on astronomy], gwon 1, “Yeoksang yeonhyeok” 曆象沿革 [History of calendrical astronomy], 1b–12b. Kim Yuk’s memorial is included in 5a–b.

ernance, which were comparable to those in imperial China. An important institution to be built was calendrical astronomy, which Joseon kings viewed as essential to presenting themselves as ideal Confucian monarchs who ruled their kingdom under the heavenly mandate.¹⁴ The kings of the late Joseon period were not exceptions in their wish to enhance the royal prestige by patronizing calendrical astronomy. When Han Heung-il 韓興一, in his 1645 memorial to the king, underlined the importance of calendrical astronomy by calling it “the prime duty of the terrestrial ruler,” he appealed to this widely accepted relation of astronomy and the Confucian monarchy as a rhetorical device to legitimize the *Shixian li* project.¹⁵

Contrary to Han’s wish, however, in the mid-seventeenth century, the promotion of royal power failed to become a major concern in the discussion at court about whether to learn the *Shixian li* system. As will be discussed later, the *Shixian li* system was viewed by literati officials as a calendrical system made by Western priests for the use of the “barbarian” Qing dynasty, an object that could never be considered a symbol of the Confucian “heavenly mandate.”¹⁶ What prevailed in the discussion at court about calendrical astronomy in this period was another, what might be called more practical, consideration: a concern for discrepancies between its own calendar and that of the Qing.

This concern of the Joseon court for discrepancies between calendars of the two countries emerged from an ambiguous position of the Joseon court in the business of making official calendars—an ambiguity that at once promoted and limited the Joseon court’s effort to possess techniques in calendrical astronomy independently from China. The tributary relation of the two countries, on the one hand, required that the Joseon court, as a tributary state, only reissue the calendars given by the imperial court. On the other hand, however, the actual process of calendar making, including that of the publication and nationwide distribution of the calendar, did not allow the Joseon court simply to wait for the arrival of the imperial calendar for the next year. The Beijing court normally issued the next year’s calendar in the first day of the tenth month, which was then brought to Seoul by the Calendar Mission

¹⁴ On the promotion of astronomy and other scientific fields during the period of King Sejong’s reign, see Park Seong-rae 朴星來, “Susiryek suyonggwa Chiljeongsan wanseong: Jungguk wonhyeongui hangukjeok byeonhyeong” <授時曆>受用斗 <七政算>完成: 中國 原型의 韓國의 變形 [Introduction of the *Shoushi li* and the making of *Chiljeong san*: A Korean transformation of the Chinese prototype], *Hanguk kwahaksa hakhoeji* 韓國科學史學會誌 24, no. 2 (2002), 166–99; Jeon Sangwoon 全相運, “Joseon jeongiui gwahakgwa gisul: 15 segi gwahak gisulsa yeongu jaeron” 朝鮮前期의 科學斗 技術-15世紀 科學技術史 研究 再論 [Science and technology in early Joseon period: The history of science and technology in the fifteenth century revisited], *Hanguk kwahaksa hakhoeji* 14, no. 2 (1992), 141–69. On technical aspects of the astronomy project in late Goryeo and early Joseon period, see Hahn Young-ho and Lee Eun-Hee, “Ryeomal seoncho pongukryeok wanseongui dojeong” 麗末鮮初 本國曆 完成의 道程 [Accomplishment of a domestic calendar system during the late Goryeo and the early Joseon period], *Dongbang hakji* 東方學志 155 (2011), 31–75.

¹⁵ *JWS*, Injo 23 (1645–46)/06/03.

¹⁶ See section 4 of this article.

(*yeokhaeng* 曆行) envoy.¹⁷ This meant that the Royal Bureau of Astronomy, responsible for making calendars for local Korean use, had little time to reproduce and distribute the imperial calendar. The Korean astronomers therefore had to calculate calendars for the next year independently, much earlier than the arrival of imperial calendars.¹⁸ Yet, the “independence” of astronomical calculation as was pursued by the Joseon court should be understood only in a limited sense. For the results of independent calculation by the Joseon astronomers, or the local calendars prepared by the Royal Bureau of Astronomy, had to be in exact accordance with that of the imperial one. Otherwise, differences between the calendars of the two countries, even in a few cases in which the former was proved to be correct, might cause serious diplomatic scandals.¹⁹

Indeed, the politico-scientific imperative to keep the “local calendar” (*hyangnyeok* 鄉曆) in accordance with the Qing calendar (*cheongnyeok* 清曆) was the single most important reason for the Joseon court’s effort to learn the *Shixian li* astronomy.²⁰ The official documents of the late Joseon period amply

¹⁷ The date that Joseon envoys received the next year’s calendar was not the same throughout the late Joseon period. It was during the eleventh month in the mid-seventeenth century, but from 1661 it was changed to the tenth month. Regulations on the “calendar mission,” including its travel schedule, are specified in *Tongmungwan ji* 通文館志 [Treatise on the Royal Bureau of Interpretation], gwon 3, 57b–58a, reprinted in a photocopy edition in two vols. (Seoul: Kyujanggak Institute for Korean Studies, Seoul National University, 2006), vol. 1, 198–99.

¹⁸ According to the regulation of the Royal Bureau of Astronomy, the court astronomers began to calculate the calendar for the year after next in the tenth month every year. Its publication began in the fourth month of the next year and was completed before the winter solstice, around which time the Bureau began to distribute the next year’s calendar. It was also around this time that the envoys brought to Joseon the copies of the next year’s calendar granted by the Qing court. On the detailed process of calendar making in late Joseon period, see Hu Yoon Sup [Heo Yunseop], “Joseon hugi Gwansanggam cheonmunhak bumunui jojigwa eommu—18 segi huban ihureul jungsimeuro” 朝鮮後期 觀象監 天文學 部門의 組織과 業務-18世紀 後半 以後를 中心으로 [The organization and official duties of the astronomical part of the Royal Bureau of Astronomy in the late Joseon period—the Cases after the late eighteenth century] (Master’s Thesis, Seoul National University, 2000), 28–32. See also Park Kwonsoo, “The Publication of Calendars in Joseon Period—A Local Science,” presented in the Annual Meeting of the Korean History of Science Society, April 21, 2012, Chungbuk National University, Korea.

¹⁹ This limitation of Joseon’s independence of astronomy from China due to the Qing-Joseon diplomatic relation is pointed out in Jun Yong Hoon, “Joseon hugi seoyang cheonmunhak,” 41–48.

²⁰ The officials and astronomers of the Joseon court in this period called the calendars made by the court as “the calendar of our Kingdom” (*aguk ji ryeok* 我國之曆) or “the local calendar” (*hyangnyeok* 鄉曆) in opposition to those by the Qing courts, which were usually called “the Qing calendar” (*cheongnyeok* 清曆). The court documents show that the term *hyangnyeok* 鄉曆 became used frequently from the first decade of the eighteenth century. See *SJWIG*, Sukjong 30 (1704–05)/12/11 and 12/17; Sukjong 31 (1705–06)/05/27 and 06/10. Kim Yuk’s memorial in the mid-seventeenth century used instead “the calendar of our kingdom.” *JWS* Injo 23 (1645–46)/12/18. The character *hyang* 鄉 was often used by the pre-modern Koreans when they referred to the local (Korean) counterpart of something Chinese, which was respectively referred

demonstrate that the court and its officials were more concerned about the discrepancies between the Qing and local calendars than any other considerations, such as the cultural implications or scientific merits of the new astronomy. Even though the cultural and scientific issues did matter in the Joseon court's policy about astronomy (as will be discussed below), those issues were never as crucial as the former in the court's consideration about whether or not to learn the new astronomy. The major moments in which the Joseon court made efforts to learn Western astronomy were with few exceptions occasioned by the scandals caused by the discrepancies from the Qing calendar, rather than by the demonstration of its scientific superiority over the old method.²¹

In 1648, for example, the Royal Bureau of Astronomy found that the local calendar for that year, calculated from the old *Datong li* system, showed serious discrepancies with the Qing calendar "not only in the fortnight periods but also in the intercalary month."²² According to the report of the Ministry of Rites, the local calendar put the intercalary month on the fourth month of the year, while the Qing *Shixian* calendar put it on the fifth month. If the Qing calendar was correct, the reports continued, the court rituals, having been originally scheduled according to the local calendar, would all violate the proper timing.²³ Similarly serious was that the differences between the two calendars might cause confusion in diplomatic matters with the Qing. For that reason, the Joseon court had no choice but to use the dates of the Qing calendar, at least in the diplomatic documents to be sent to the Qing, as was advised to the king by the Royal Bureau of Astronomy and the prime minister, Kim Jajeom 金自點.²⁴ Normally, such failures in calendar making were considered to be grave faults for the court astronomers to be blamed for, or even to be punished for. In this case, however, the court astronomers were able to escape the responsibility because the discrepancies between the two calendars were obviously caused by Qing's adoption of Adam Schall's new system, a system that Korean astronomers did not yet fully understand.²⁵

Because of this scandal, the court decided to speed up the project of learning the

to by the character *dang* 唐. A relatively well-studied example is the opposition between the local medicine (*hyangyak* 鄉藥) and the Chinese medicine (*dangyak* 唐藥) that appeared frequently in *materia medica* texts of the late Goryeo and early Joseon periods. See Soyoung Suh, "Herbs of Our Own Kingdom: Layers of the 'Local' in the *Materia Medica* of Early Chosŏn Korea," *Asian Medicine* 4 (2008), 395–422.

²¹ This does not necessarily mean that the adoption of Jesuit astronomy in Ming and Qing China was decided on more "scientific" grounds than that in Korea. Recently, Lü Lingfeng shows impressively that the eclipse predictions of the Jesuit astronomy were not as accurate as were claimed by the Jesuits and their Chinese supporters like Xu Guangqi. See Lü Lingfeng, "Eclipses and the Victory of European Astronomy in China," *East Asian Science, Technology, and Medicine* 27 (2007), 127–45. It is undeniable, however, that the precision of astronomy was an issue that was much more important in the cases of Ming and Qing China than it was in Joseon Korea.

²² *SJWIG*, Injo 26 (1648–49)/03/07.

²³ *JWS*, Injo 26/*yun* 閏 03/07.

²⁴ *SJWIG*, Injo 26/03/07.

²⁵ *Ibid.*; *JWS*, Injo 26/*yun* 閏 03/07.

Shixian li system, which had been at a standstill since its official inception in 1645–46. After endorsing the ad hoc measure to follow the Qing calendar in the documents to be sent to the Qing, the king complained, “We should not keep going on in this manner for every occasion [we find discrepancies between the two calendars].” A fundamental solution should be sought as soon as possible. He thus ordered that a capable official, one whose mission would be to learn the new astronomy, would accompany annual missions to the Qing court.²⁶ For several years thereafter, the court dispatched to Beijing two official astronomers, Song Innyong 宋仁龍 and Kim Sangbeom 金尙范, who eventually learned the basics of the *Shixian li* method from Adam Schall von Bell and Chinese astronomers. Consequently, the court was able to issue its own calendar according to the *Shixian li* method beginning in the year 1654.²⁷

Similarly, when the Joseon court launched its second effort to learn Western astronomy, about fifty years later, discrepancies between the calendars of the two countries for the year 1705 caused another scandal, this time over disagreements in the length of lunar months. The court sent an astronomer named Heo Won 許遠 to Beijing to master what had remained unstudied for the previous half century, including the methods for calculating planetary movements.²⁸

The concern of the Joseon court for discrepancies between the two calendars was so overwhelming that even in cases where the local calendars were proved to be technically correct, the court decided, with few exceptions, to follow the Qing calendars. An illuminating case is one caused by the calendar for the eleventh year in the Yongzheng 雍正 reign period (1735–36). In this case, the calendars of the two countries showed serious disagreements in the matters of intercalation and the length of lunar months. In contrast to previous cases of calendar discrepancies, in which the blame had usually been ascribed to the incompetence of the Korean astronomers, the Royal Bureau of Astronomy at this time successfully pointed out a technical reason for the disagreements in intercalation: the time difference between Seoul and Beijing. This posed to the court a dilemma: “if the court follows the Qing calendar, the fortnight periods would not be in accordance [with the heavens]; but if the court does not follow it, there would be inconveniences in the matter of exchanging documents with the Qing.” The court opinion concerning the two alternatives was divided into two camps. The first one argued for following the local calculation, on the grounds that if the discrepancies with the Qing calendar were caused by the time difference between Seoul and Beijing, it was the local calculation rather than that of the Qing that would correspond to the celestial phenomena as observed in Seoul. This position, which prioritized the astronomical principles, however, failed to be accepted by the majority of the court officials, who were

²⁶ *SJWIG*, Injo 26/03/07.

²⁷ For the process of learning Western astronomy in this period, see *SJWIG*, Injo 26/09/12; Hyojong 孝宗 01 (1650–51)/07/19; Hyojong 03 (1652–53)/09/15; Hyojong 04 (1653–54)/01/06.

²⁸ *SJWIG*, Sukjong 肅宗 30 (1704–05)/12/11; Sukjong 31 (1705–06)/06/10; Sukjong 33 (1707–08)/02/27.

mostly more concerned with the diplomatic matters with the Qing. The King endorsed the majority opinion.²⁹

This pattern was repeated during the whole of the eighteenth century, whenever the Joseon court found major discrepancies with the Qing calendars, particularly when the Qing dynasty adopted new calculation models and methods such as the *Through Investigation of Calendrical Astronomy* (*Lixiang kaocheng* 曆象考成) and its *Sequel* 後編 in 1726 and 1742, respectively.³⁰

3

Beyond the basic motives of the astronomy project, even the actual process of learning Western astronomy was conditioned, to a considerable degree, by the Qing-Joseon relationship. As mentioned briefly in the preceding discussion, among the most important means by which the Korean court could learn Western astronomy was to dispatch its officials, specifically astronomers and interpreters to the Beijing court on the occasion of annual tributary missions. In these cases, the annual Beijing mission included professional astronomers, titled *ilguan* 日官, whose assignment was to obtain calculation manuals and instruments, or to learn the methods directly from the Jesuits and Chinese astronomers in the Imperial Bureau of Astronomy. Official interpreters (*yeokgwan* 譯官) also played an important role in the astronomy mission. Being specialists in foreign languages, these interpreters took charge of various practical matters in Beijing missions, including political, diplomatic, and commercial affairs. In the astronomy mission too, their service was essential in finding ways to approach relevant persons in the Imperial Bureau of Astronomy and carrying out negotiations with them. This scheme of using official astronomers and interpreters, each being specialists in astronomy and in the mission business respectively, was adopted from the first moment of the project to learn the *Shixian li* astronomy.³¹

As is well known, it was a well-established practice that the Koreans in the pre-modern period used their tributary missions as opportunities to introduce to their country the cultural resources of China. Astronomy was not an exception. Even from the meager documentary evidence concerning the process of learning the *Shoushi li* system in the fourteenth and fifteenth centuries, it is obvious that the Korean court used the diplomatic channel with the Yuan and Ming dynasties to acquire secrets of the Chinese calendrical system.³² In its actual method too, there-

²⁹ The quotation is from *JWS*, Yeongjo 10 (1734–35)/11/19. More detailed descriptions of the discussion at court about this problem are found in *SJWIG*, Yeongjo 10/04/10, 11/18, 11/19, and 11/20. See also Jun Yong Hoon, “Joseon hugi seoyang cheonmunhak,” 41–42.

³⁰ *Ibid.*, 33–40.

³¹ For example, Kim Yuk’s memorial proposed this scheme. See, *JWS*, Injo 23 (1645–46)/12/18.

³² See, for example, Hong Bonghan et al., *Jeungbo munheon bigo*, 1b–12b, which recorded a few cases in which the Goryeo and Joseon courts dispatched astronomers to China to learn the *Shoushi li* system in the fourteenth and fifteenth centuries. For a comprehensive historical ac-

fore, the late Joseon effort to learn the Jesuit astronomy can be viewed as a repetition of what they had done to learn the Yuan and Ming astronomical systems several centuries before.

This does not mean, however, that the Chinese court cooperated with Korean efforts to learn their astronomy. On the contrary, calendar making was considered an Imperial prerogative, and thus was not to be practiced by its subjects, not to mention the rulers of a tributary state. Even though the Ming and Qing courts in reality seemed to overlook the “illegitimate” practice of calendar making by the Joseon, they never allowed the Koreans free access to their astronomical knowledge. In his proposal to learn the *Shixian li*, Kim Yuk expressed his awareness of the practical difficulties of the project. “The practice of calendar making by foreign countries is what the Middle Kingdom (*jungwon* 中原) does not allow. It is therefore impossible for us to send envoys and to make an *official* request [to the Qing court] to learn [their astronomy].” Only “illegal” measures, such as secretly contacting the Jesuit and Chinese astronomers, were available to the Koreans.³³ Therefore, the Korean astronomers and interpreters dispatched to Beijing had to find ways to circumvent the severe regulations imposed by the Qing upon the circulation of astronomical books and instruments. This is one of the reasons that it took almost a century for the Royal Bureau of Astronomy to master and then to fully implement the *Shixian li* system.

To acquire astronomical manuals and instruments through “illegal” methods was particularly difficult in the mid-seventeenth century, when the Qing court had just adopted the *Shixian li* system. Even though the Joseon court immediately launched a project to “secretly purchase” (*milmae* 密買) the technical manuals and tables by approaching the famous Jesuit astronomer Adam Schall von Bell in 1645, the Korean astronomers and interpreters could not easily find ways to contact him.³⁴ It took three years before a Korean astronomer, Song Innyong, eventually met him during his mission in the winter of 1648–49. Song soon encountered another difficulty, however. His only means of communication with Schall was “brush talk” (*pildam* 筆談) using Chinese, which was not a very effective means for communicating professional knowledge.³⁵ Mainly due to this difficulty, Song Innyong could learn from Schall “only the method of calculating the solar movements.”³⁶ Another impediment was that these efforts of the Korean envoys for contacting relevant persons in Beijing turned out to be very expensive. The Koreans had to pay considerable “gifts” to gain access to the Jesuit and Chinese astronomers.³⁷

count of this process, see Park Seong-rae, “Susiryek suyonggwa Chiljeongsan wanseong”; also Hahn Young-ho and Lee Eun-Hee, “Ryeomal seoncho pongukryeok wanseongui dojeong” (footnote 14).

³³ *JWS*, Injo 23 (1645–46)/12/18.

³⁴ *JWS*, Injo 24 (1646–47)/06/03.

³⁵ *JWS*, Hyojong 孝宗 01 (1650–51)/07/19.

³⁶ *SJWIG*, Hyojong 01 (1650–51)/07/19.

³⁷ The great expense for preparing gifts for the Chinese became a serious issue at court. The Min-

The official ban of the Qing on the circulation of astronomical knowledge was not the only source of difficulty in this first attempt to learn Western astronomy. The antagonistic political relation of the two countries in the aftermath of Qing's military campaign to Joseon in 1637 worsened the situation. Highly suspicious of Joseon's loyalty to the new imperial regime, the Qing court imposed strict regulations on the behavior of the Korean envoys in Beijing. Thus the Korean astronomer Song Innyong, dispatched to Beijing in the spring of 1648 with the mission to contact Schall, had to spend most of his stay confined to the Korean residence in Beijing without having any chance to meet the alleged founder of the *Shixian li* system.³⁸

Yet, the situation improved gradually as the political relationship between Qing and Joseon began to be ameliorated in the early eighteenth century. Even though there had been little change in the Qing court's policy about astronomy, this new improved political relation provided the Korean envoys in Beijing with much more freedom to maneuver than ever before in their efforts to contact the Jesuits and Chinese court astronomers.³⁹ Precisely during this period, the Joseon court launched its second major attempt to master Western astronomy, this time with substantially greater success. Heo Won, the astronomer sent to Beijing after the 1705 calendar scandal, established a favorable relationship with a Qing astronomer named He Junxi 河君錫, with whom the Korean astronomer, even after returning to Korea, exchanged letters of inquiry about the astronomical tables and calculation methods.⁴⁰ Korean astronomers, from about the 1720s, were able to establish a long-term connections not only with Chinese astronomers, but also with a few Jesuit astronomers as well, such as Ignatius Kögler and August Hallerstein, who helped the Koreans in their efforts to gain knowledge of a series of major astronomical reforms in eighteenth-century China.⁴¹

istry of Finance was even suspicious of the possible embezzlement of government expenses by the official interpreters. See *SJWIG*, Hyojong 03 (1652–53)/09/15; 09/24.

³⁸ *SJWIG*, Injo 仁祖 26 (1648–49)/09/20.

³⁹ About the changing relationship between Qing and Joseon and its cultural impact upon Joseon society, see Kim Munsik 金文植, *Joseon hugi jisigin-ui daewoe insik* 朝鮮後期 知識人の對外認識 [Korean intellectuals views on foreign countries in late Joseon period] (Seoul: Sae-munsa, 2009); No Daehwan 盧大煥, *Dongdo seogiron hyeongseong gwajeong yeongu* 東道西器論形成過程研究 [A study on the idea of “the Eastern way and the Western utensil” in late Joseon period] (Seoul: Iljisa, 2005).

⁴⁰ *SJWIG*, Sukjong 34 (1708–09)/06/20.

⁴¹ A young literatus, named Yi Giji, who visited Beijing in 1720–21, played an important role in establishing connections with the Western Jesuits. In his *Beijing Travelogue*, Yi left a detailed report about how he made contacts with the Jesuits. See Lim Jongtae, “‘Postponed Reciprocity’: How Did a Korean Traveler Portray His Encounter with Westerners in Early Eighteenth-Century Beijing?” *Horizon* 2 (Institute of Humanities, Seoul National University, 2010), 175–193.

To this point, this paper has emphasized that the late Joseon project of learning Western astronomy was carried out in the context of the Qing-Joseon scientific and political relations. The Joseon court’s interest in Western astronomy was motivated, more than anything else, by the perceived imperative to keep its calendar in accordance with that of the Qing dynasty. We cannot say, however, that the scientific merits and cultural implications of the new Western astronomy did not matter at all to the Joseon court and literati officials. As was the case in seventeenth-century China, the court and literati intellectuals debated whether they should adopt the new calendrical system in spite of its dubious cultural origin in the “barbarian” West.

Opposition to the new astronomy was particularly pronounced during the second half of the seventeenth century. Many officials and general intellectuals showed skepticism or even hostility toward the new Western astronomy. For example, in 1648, when the *Shixian* calendar brought from the Qing showed discrepancies from that of the Korean one in the matter of intercalation, many officials continued to place their trust in Korean calendar, which had been calculated from the old *Da-tong* method. The court historian, who recorded this episode in the *Veritable Records* (*Shillok* 實錄) of the dynasty, openly ridiculed the “imprudent behavior” of Han Heung-il, who advocated the Qing calendar “without firm evidence for its correctness.”⁴²

The Korean opponents criticized the *Shixian li* system mainly for the following three reasons. First, they disputed the method of the “fixed fortnight period” (*dingqi* 定氣) adopted in the *Shixian li* system. According to them, this method, which set the fortnight periods reflecting inequalities of the solar motion along the ecliptic, caused apparent irregularities in setting intercalary months, while the traditional “constant fortnight period” (*pingqi* 平氣) method, which divided a year evenly into 24 equal time periods, had no such problem.⁴³ Second, they denounced the Western astronomy, for it was built upon absurd cosmological ideas, such as the concept of a round earth that contradicted the commonsensical worldview of a flat earth.⁴⁴ In these two points of criticism, there was nothing specific to the Korean

⁴² JWS, Injo 26 (1648–49)/閏3/07.

⁴³ For Korean criticisms of the “fixed fortnight period,” see Jun Yong Hoon, “17–18 segi seoyang gwahagui doipgwa galdeung: shiheon ryeok sihaenggwa jeolgi baechibeobe daehan nollaneul jungsimeuro” 17–18 世紀 西洋科學의 導入과 葛藤: 時憲曆 施行과 節氣配置法에 대한 論難을 中心으로 [Introduction of Western science and the subsequent debates in the seventeenth and eighteenth centuries: Implementation of the *Shixian li* and the debates about fixing the fortnight periods], *Dongbang hakji* 東方學志 117 (2002), 1–49. Compare the Chinese debate on the same issue, Chu Pingyi, “Scientific Dispute in the Imperial Court: The 1664 Calendar Case,” *Chinese Science* 14 (1997), 7–34.

⁴⁴ For Korean criticism of the Western idea of a round earth, see Koo Mhan-ok 具萬玉, “Joseon hugi jiguseol suyongui sasangsajeok uiui 朝鮮後期 地球說受容의 思想史的 意義 [The sig-

cases. Many contemporary Chinese disagreed with Western astronomy for similar reasons, as can be seen, for example, in Yang Guangxian's 楊光先 criticism of Adam Schall in early Kangxi period.

Yet, the third and the last reason for the Korean criticism of the *Shixian li* astronomy was perhaps more specific to the Korean cases, reflecting the dominant cultural and ideological sentiments of Korean literati intellectuals in the second half of the seventeenth century. Korean opponents of the *Shixian li* calendar viewed it as culturally problematic, since it was, they thought, made by Western "barbarians" for the use of other "barbarians," namely, the Qing dynasty. This cultural criticism of Western astronomy was extremely forceful, considering the anti-Qing sentiments that prevailed in Joseon society after the Qing's invasion of Joseon and the subsequent Ming-Qing dynastic change. The Neo-Confucian schools, which dominated both the academic world and the court politics of the period, idealized the tributary relation of Joseon and the previous Ming dynasty as representing the normal world order—a desirable hierarchy ordained by heavenly principle between the Middle Kingdom and outer barbarians. This ideal world order, according to those Confucian scholar officials, found its material and institutional expressions in the *Datong li* calendar of the Ming dynasty and the ritual of the annual granting of the calendar to the Joseon. In this milieu of a heightened anti-Qing sentiment, the *Shixian* calendar was viewed as the calendar of a barbarian regime that had usurped the legitimate world order, and had therefore become an object of suspicion, or even hatred, to the Korean Confucian literati.⁴⁵

Curiously, however, no matter how serious the Korean Confucians might be, the opposition to the *Shixian* calendar failed to make any fundamental difference in the course of its introduction to late Joseon Korea. The opponents perhaps played a role in delaying the introduction process during the second half of the seventeenth century. In this period of skepticism, the Joseon court invested little effort in learning the new Qing astronomy, after having mastered only the basic parts of the *Shixian li* method in the early 1650s. Yet, even the most determined opponents of the Western astronomy could not ignore the fact that Joseon, as a tributary state of the Qing, had no other option but to follow Qing's calendrical system.

One ironic episode illustrates this point impressively. For several years, beginning in 1667, the Joseon court restored the old *Datong* calendar. This decision, however, was not made as a result of harsh internal criticisms of the *Shixian* calendar. In fact, the Joseon court simply followed the decision of the Qing, which en-

nificance of the acceptance of the idea of a round earth in late Joseon period],” in *Ha Hyeongang gyosu jeongnyeon ginyeom nonchong—hanguksaui gujowa jeongae* 河炫綱教授定年紀念論叢—韓國史의 構造와 展開 (Seoul: Hyeon, 2000), 717–47. For the Chinese debate on the same topic, see Chu Pingyi, “Trust, Instruments, and Cross-Cultural Scientific Exchanges: Chinese Debate over the Shape of the Earth, 1600–1800,” *Science in Context* 12, no. 3 (1999), 385–411.

⁴⁵ Koo Mhan-ok, *Joseon hugi gwahak sasangsa yeonggu 1: Jujahakjeok ujuronui byeondong* 朝鮮後期 科學思想史研究 1: 朱子學的 宇宙論의 變動 [A study on scientific thought in late Joseon period: The cosmology of Zhu Xi schools and its transformation] (Seoul: Hyeon, 2005), 267–71.

dorsed Yang Guangxian’s infamous accusations against Jesuit astronomy and thus restored the old method. The Joseon court documents shows that some officials welcomed the restoration of the *Datong* calendar. Yet the Joseon court was not in a position to wholly celebrate Qing’s sudden change of its calendar, because the Joseon court had by that time already distributed its own calendar for the next year, which was made according to the *Shixian li* method. The main concern of the court discussion was again about how to solve the discrepancies between the local and the Qing calendars for the next year, in this case those between the local *Shixian* and the Qing *Datong* calendars.⁴⁶ Meanwhile, the Kangxi emperor rehabilitated the Jesuits’ astronomy three years later, and this time, too, the Joseon court had to follow the whims of the imperial court. This episode shows that the scientific and cultural considerations had only secondary importance for the Joseon court and its officials in deciding whether to adopt Western astronomy.⁴⁷

It might even be said that one of the main impacts of the literati’s criticisms of Western astronomy was that it contributed, albeit indirectly and unintentionally, to the process of “Sinicization” of Western astronomy in the eighteenth century. To legitimize their use of the *Shixian li* calendar, as against the literati’s criticism of the Western astronomy, particularly toward its dubious cultural origin, the Joseon court and the literati proponents of Western astronomy attempted to give it a more sound cultural identity.

A prominent solution, which seemed to make its first appearance in the discussion at court in the first decade of the eighteenth century, was to view the Western astronomy as a cultural legacy of the fallen Ming dynasty. When the Joseon court made copies of Adam Schall’s star atlas and Matteo Ricci’s world map in 1708, for instance, the director of the project, Choe Seokjeong 崔錫鼎, emphasized that the two works had been made “in the early years of the Chongzhen reign period in the August Ming dynasty.” He was particularly moved, he confessed in the preface, at seeing in the two Jesuit works such phrases as “the *Mujin* year (1628) of the Chongzhen reign period” (*Chongzhen wujin* 崇禎戊辰) and “the Unity of the Great Ming” (*daming yitong* 大明一統). Choe even associated the Jesuit world map and star atlas with “the world ordering of Yu the Great” and “the calendar of the Zhou dynasty” (*wubong juryeok* 禹封周曆), in other words, the sacred institution of geography and astronomy created by the sage rulers in the ancient “Middle Kingdom.”⁴⁸

Being suggested as a part of the broader cultural movement led by the court and

⁴⁶ JWS, Hyeonjong 顯宗 7 (1666–67)12/10.

⁴⁷ As for this process, see Jun Yong Hoon, “Joseon hugi seoyang cheonmunhak-gwa,” 22.

⁴⁸ Choe Seokjeong 崔錫鼎, *Myeonggok jip* 明谷集 [Complete works of Mr. Myeonggok], gwon 8, “Seoyang geonsang gonyeo do ibyeong chongseo” 西洋乾象坤輿圖二屏總序 [Preface to the two folding screens of the star map and the world map of the West]. The electronic texts of *Myeonggok jip* and other numerous Korean munjip 文集 are available in the official website of the Institute for the Translation of Korean Classics, <http://db.itkc.or.kr/itkcdb/mainIndexIframe.jsp>.

the literati intellectuals in commemorating the sixtieth anniversary of the fall of the Ming dynasty,⁴⁹ the view of the *Shixian* calendar as a Ming legacy signaled a significant change in the attitudes of the Joseon court toward the Qing-Western astronomy. As Choe argued, because the *Shixian li* astronomy had originally been made under the auspices of the Ming Chongzhen 崇禎 emperor, it could be regarded as a noble legacy of the Ming dynasty. For this reason, he implied, it could rightly be adopted by the Joseon Kingdom—allegedly the only bearer of the culture of the “Middle Kingdom” after the fall of the Ming. It might therefore be said that the attribution of the *Shixian li* system to the Ming legacy was not suggested as the logic for negating the reality that the former was the official calendrical system of the Qing dynasty. On the contrary, the proponents of the *Shixian li* astronomy seemed to aim at overlapping a sense of sacred historical origin over this apparently “barbarian” institution—an act of powerful endorsement of the latter.

This shift in the cultural identity of the *Shixian li* system coincided with the second major attempt of the Joseon court to learn the Qing-Western astronomy, and this coincidence made the astronomy project in the first decade of the eighteenth century very much different from the previous one. As the stigma of “barbarism” previously attached to the *Shixian li* system weakened, the court and its officials became much more supportive of the astronomy project. It was in this changed climate of opinion that the Royal Bureau of Astronomy made an aggressive proposal for a full-scale implementation of the *Shixian li* system, an ideal that had remained unfulfilled for the previous half century. In their proposal, the Bureau criticized the previous state of calendrical astronomy as an undesirable mixture of the two different methods, the *Datong li* and the *Shixian li* methods. “[This means that] a state has a calendrical system consisting of two different methods (*ilguk ibeop ryeok* 一國二法曆),” the Bureau continued, “a situation that is extremely inappropriate to the prestige [of our Kingdom].”⁵⁰ In this, the astronomer proposed the implementation of the *Shixian li* system as a necessary requirement of the kingly governance, and quite unlike the case in the mid-seventeenth century, this claim was well accepted by the King and the high literati officials.

The assertion that the *Shixian li* was a Ming legacy was repeated throughout the eighteenth century, particularly at the major moments when the court and literati officials attempted to promote calendrical astronomy. For instance, when Seo Myeong-eung 徐命膺, a prominent literati astronomer and mathematician of the mid-eighteenth century, proposed to the Prince Regent astronomical measurements at the local provincial capitals in 1761, he justified his proposal as one of the necessary measures for a full-scale implementation of the Chongzhen emperor’s as-

⁴⁹ The culmination of this movement was the creation in 1704 of an altar in the royal palace to perform rites to commemorate the Ming emperors. About this movement, see Jeong Okja 鄭玉子, *Joseon hugi Joseon junghwa sasang yeongu* 朝鮮後期朝鮮中華思想研究 [A study of the idea of Joseon as the middle kingdom in late Joseon period] (Seoul: Iljisa, 1998), 9–25 and 66–99.

⁵⁰ *SJWIG*, Sukjong 33 (1707–08)/02/27.

tronomy. “Since the institutions of the august Ming dynasty are now preserved only in this Eastern land,” he argues, “how could we omit even one of them, namely the institution of ‘revering heaven and granting seasons to the people (*gyeongsu* 敬授)?”⁵¹

In the eighteenth century, the Korean literati astronomers found ways to see even the technical content of the *Shixian li* astronomy not as purely Western but as, at least partly, Chinese. Seo Hosu, for example, understood the *Shixian li* system as a synthesis of Western and Chinese astronomy. According to his scheme about historical development of the current astronomical system, “it owed its principles to a scholar of the great West named Tycho.” They were then “elaborated and translated into Chinese by Xu Guangqi 徐光啓” in his *Treatises on Calendrical Astronomy in the Chongzhen Reign Period* (*Chongzhen lishu* 崇禎曆書), and “annotated and clarified by Mei Wending 梅文鼎” in his *Complete Works on Astronomy and Mathematics* (*Lisuan quanshu* 曆算全書). It was the *Thorough Investigation of Calendrical Astronomy* (*Lixiang kaocheng* 曆象考成), Seo concluded, that “accomplished the final synthesis between Chinese and Western astronomy.”⁵²

From the late eighteenth century, a number of literati even advocated the so-called “theory of the Chinese origin of Western astronomy,” which had been proposed by Mei Wending and his successors in the Qing Evidential scholarship. According to this theory, which was widely circulated among Korean literati society from the late eighteenth century, the basic principles of Western astronomy had their historical origin in the teachings of ancient Chinese sages. Thus, they argued, the adoption of the *Shixian li* system was, in fact, the restoration of the noble institution of ancient sage rulers, which had been lost for a long time in the “Middle Kingdom.” In other words, the *Shixian li* was never a purely Western astronomy adopted by the Manchu dynasty; it was a legacy of the old, noble culture of ancient China, which had been rehabilitated in the august Ming dynasty, a legacy that the Confucian Joseon kingdom alone was entitled to promote in the world then dominated by “Qing barbarism.”⁵³

⁵¹ *SJWIG*, Yeongjo 英祖 36 (1760–61)/12/08. At this period, the crown prince, who was to be called after his tragic death the Crown Prince Sado 思悼世子, was acting as regent of his father King Yeongjo.

⁵² Seo Hosu 徐浩修, *Sago* 私稿 [Private manuscripts], “*Lixiang kaocheng bohae in*” 曆象考成補解引 [A preface to the expositions that complements the *Lixiang kaocheng*], manuscript preserved in the Ehwa Womans University Library, Seoul.

⁵³ On the idea of the Chinese origin of Western astronomy in late Joseon period, see No Taehwan, “Joseon hugi ‘seohak Jungguk wollyu seol’ui jeongaewa geu seonggyeok” 朝鮮後期 “西學中國原流說”의 展開과 그 性格 [Theory of the Chinese origin of Western science in Late Joseon period], *Yeoksa hakbo* 歷史學報 178 (2003), 113–39.

To conclude, the late Joseon project to introduce Western astronomy was carried out in the context of the Sino-Korean relationship. It was a repetition of the age-old practice of Korea to adopt the new calendrical systems of the dynasties in the China continent. The prime motive driving the Joseon court to invest in this astronomy project was practical concerns for the discrepancies between the calendars of the two countries, which might provoke serious reactions in the rituals at court, and in the diplomatic relations between the two countries. The tributary relations of the two countries gave the late Joseon project both opportunities and constraints in the actual process of learning the new astronomical method. The proponents of the *Shixian li* system attempted to give this Qing-Western astronomy a sound cultural identity by demonstrating its “Chineseness,” both in its technical content and in its historical origin.

This episode suggests that, in a politico-cultural periphery like Joseon court, the encounters with science from another culture, as well as the scientific practice of calculating ephemerides, were carried out in a way very different from those at the imperial court in Beijing. Previous research in the history of science in Korea attempted to discover in this episode a “direct cultural contact” of the Koreans with Western science, which enabled the Korean astronomers to investigate the celestial phenomena in a more correct or “scientific” way than ever before. As has been shown here, however, the literati officials and astronomers at the Joseon court made efforts to achieve agreements of their calculation with that of the Qing astronomers, rather than with the celestial phenomena per se. A similar point could be made for the so-called cultural encounter between Korea and the West. Although astronomers and literati officials at court knew very well that the *Shixian li* system adopted a European astronomical model, they had an interest in learning “Western” astronomy mainly because it had been adopted as the official calendrical system of the Qing dynasty. In other words, the “West” became an important object of the cultural interest at the Joseon court, only insofar as it was seen as one of the diverse cultural resources available in the Qing Empire. It might therefore be said that the court and its officials in late Joseon period viewed the outer world, the worlds of nature and other culture, through a dense medium of the Qing-Joseon relationship.

Abstract

In 1645, soon after the Qing dynasty adopted the Jesuit-devised *Shixian li* as its official calendrical system, the Joseon court launched a project to learn the methods of the new Jesuit calendar. For over a century thereafter, the Joseon court sent a series of official missions to Beijing to learn calculation methods from the Jesuit and Qing astronomers. Contrary to previous historical accounts that portrayed this process as the introduction of “Western science” into Korea, this paper relocates the late Joseon episode of learning Western astronomy into a more proper historical context, of the politico-scientific relations of the Qing and Joseon dynasties, and suggests that the late Joseon project to learn Western astronomy might be better viewed as an attempt to introduce the astronomical system of a new ruling dynasty of the China continent. The Qing-Joseon politico-cultural relations, this paper argues, provided the Joseon court with the basic motive for its attempt to adopt Western astronomy; the actual process of the astronomy project, including its timing and the ways of carrying out businesses, was also conditioned by ever changing features of the Qing-Joseon relationship; Finally, that relationship was not a mere “external” factor that only accelerated or inhibited the government astronomy project; it also played a role that might be called epistemological, in the sense that it fundamentally shaped how astronomers and literati officials at Joseon court viewed the “outer worlds”—the world of stars, as well as that of another culture called “the West.”

Key words: *Shixian li* calendrical system, Qing-Joseon tributary relation, the Jesuits, the Royal Bureau of Astronomy, Western science.