

Jeon Sang Woon and Joseph Needham: Some Materials from the NRI Archives*

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Jeon Sang Woon¹ 전상운 金相運 (1932-2018) was the most influential historian of Korean science of the twentieth century, within his native land, and even more so in other countries, where his books were often the first and only means by which many scholars were made aware of the history of science and technology in Korea. He was born a generation later than another great historian of science in East Asia, Joseph Needham (1900-1995). His interest in the history of science began in 1955 when he studied an article by George Sarton, but it moved to a new level of commitment after his encounter with the first volume of Needham's *Science and Civilisation in China* series in 1959. Although the economic, social, and political circumstances of Korea at that time were hardly propitious for launching a career in a new discipline, his intellectual path was set for the rest of his life.² It was to be another fifteen years before Jeon and Needham actually met, but within a few years of Jeon's encounter with Needham's writing, there began a prolonged and fruitful correspondence with Needham and his collaborators that was to have a deep influence on all those who were involved. The aim of this article is to outline the nature and consequences of the relationship created by that correspondence, using some of the letters preserved in the archives of the Needham Research Institute, Cambridge.³

The first contact came through Derek John de Solla Price (1922-1983), a distinguished American historian of science. Price had worked with Needham on the research and writing of *Heavenly Clockwork: The Great Astronomical Clocks of*

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* This article is based on a talk I gave at Sungshin Women's University, Seoul, on 16 November 2018, as part of a day of events in commemoration of the life and work of Jeon Sang Woon. I am most honoured to have been invited to take part; I would also like to express my gratitude to Professor Lim Jongtae, who also spoke at this event, for suggesting that I might prepare this longer version of my talk for publication.

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¹ I give his name as he usually wrote it in Romanised form.

² See the detailed outline of his life and work in Shin Dong-won, "Obituary – Jeon Sang-woon 金相運 (1932-2018)," *East Asian Science, Technology, and Medicine (EASTM)* 47 (2018), 9-17.

³ These letters may be located through the University of Cambridge Janus portal (<http://janus.lib.cam.ac.uk>).

Medieval China,⁴ a study of the water-driven mechanical clocks of medieval China, and in particular of the great astronomical display tower whose construction was planned by Su Song 蘇頌, and completed around 1094. Two years after the publication of that work, Price wrote to Joseph Needham from Yale, where he was chairman of the department of history of science, in a letter dated 28 February 1962 that makes clear his excitement at a new discovery:

Dear Joseph:

At last I have managed to get photographs of the Korean clock mentioned by Rufus. Through the good offices of Mr. Sang Woon Jeon of Sung Shin Girls High School, Don Am Dong, in Seoul, Korea and through my graduate student Mrs. Eri Yagi Shizume, who has been writing to him in what seems to be a mixture of Japanese and Chinese, we shall be able to find out that the clock is now in the museum of University of [South] Korea in Seoul. It may, I think, even be possible, considering American interest in that country, to get the clock brought to, say, the Smithsonian Institution for a special exhibition and study.

The photos show that the clock is indeed, as we had suspected, much nearer to Su Sung than anything European or even Jesuit. I am fascinated with a big wheel that seems to have twelve radial spoons on it which, it is alleged, pump bowls [Needham corrects to ‘balls’] from low to high; hence, they are permitted to fall onto gongs. Some of the gearing looks very Chinese, especially on the biggest drive wheel near the spoons. Other gearing looks more European; and I gather that, at one of the five or six rebuildings Western clock gears were added. The information I derived tenuously so far says that the clock was built in 1657 and rebuilt in 1664, 1669, 1687, 1704 and 1732. There also seems to be a statement that armillary sphere itself is from 1433.

Since I cannot do much more from these photos, I send them and all the information I have to you immediately. Keep them for the time being since I hope that we shall either get finer official photos or even the instrument itself for examination. I am rather excited by the whole business and think it will be worth a good paper.

But what was this “clock mentioned by Rufus”? Price had evidently read a page of Rufus, “Astronomy in Korea” (1936) where we see the following.

⁴ Joseph Needham, Ling Wang, and Derek J. de Solla Price, *Heavenly Clockwork: The Great Astronomical Clocks of Medieval China* (Cambridge: Cambridge University Press, 1960).

A Syen-kui-ok-hyung 璇璣玉衡⁵ or kind of astronomical clock was ordered by King Hyo Chong in 1657. Hong Chu-yoon 洪處尹 attempted its construction, but the result was not a complete success. Afterward a magistrate, Choi Yoo-chi 崔攸之 by name, was found, who had contrived an instrument of that kind, so he was ordered to make one for the king. According to the Mun-hon-pi-go [文獻備考] it moved automatically by the motion of water and indicated very accurately the degrees of movement of the sun and the moon as well as the time of day.

A somewhat similar clock that is, however, run by weights and is probably of a later date, is at the home of Mr. Kim Sung-soo 金性洙⁶ who kindly permitted us to photograph it. The length is about four feet, height of main part three feet three inches and width one foot nine inches. The astronomical sphere has a diameter of sixteen inches and the terrestrial globe about three and a half. The time of day is given by disks carried around on a vertical wheel and displayed through a window at the side. The position of the sun is given on the band representing the ecliptic, which marks the 24 solar divisions of the year. The motion of the moon is indicated on the ring representing its orbit, which is divided by pegs to mark the 27 lunar constellations. The mechanism is driven by two weights, one for the wheels and gears of the time piece, which is regulated by a pendulum with simple escapement; and the other for the striking device, which contains several iron balls and releases them to roll down a trough and trip the hammer that strikes the gong, then are lifted by paddles on a rotating wheel to repeat the process. The geography of the terrestrial globe includes some sixteenth century voyages of discovery. The maps of the Old World and of South America are quite natural; but North America appears to have suffered from the effect of an explosion, as it consists of several islands with very irregular outline.⁷

The accompanying photograph, Rufus's figure 26, shows us a tantalising view of

⁵ This ancient term, first found in Chinese texts of the later first millennium BCE, was anachronistically interpreted as a reference to an armillary sphere by commentators writing several centuries later. Its original significance is unclear: it may have referred to certain circumpolar stars, or perhaps to a diviner's 'cosmic model' representing heaven as a disc turning round an axis at the centre of a square plate representing the earth. See Christopher Cullen, "Some Further Points on the Shih," *Early China* 6 (1981), 31-46 and Christopher Cullen and Anne S. L. Farrer, "On the Term Hsüan chi and the Flanged Trilobate Jade Discs 1," *Bulletin of the School of Oriental and African Studies* 46 (1983), 52-76.

⁶ Kim Seongsu (1891-1955), the founder of Korea University, was an entrepreneur, independence activist, and politician who served as Vice-President of the Republic of Korea from 1951 to 1952.

⁷ Will Carl Rufus, "Astronomy in Korea," *Transactions of the Korea Branch of the Royal Asiatic Society* 26 (1936), 1-48 (followed by tables and plates), quoted from 38-39.

some kind of armillary sphere mounted on a wooden structure that evidently conceals the mechanism described in the text. Given his work on Su Song's device, Price's initial curiosity on reading Rufus is understandable, and his excitement at the news that it was still in existence is obvious. We have two handwritten letters in Japanese from Jeon Sang Woon that evidently represent what Derek Price received. The originals in the Needham Research Institute are accompanied in each case by English translations made in Cambridge by Philippa Hawking. (It does not appear that Price was able to read the original letters himself.) The translation of the first letter begins:

1962. Jan 25.

Dear Eri Shizume,

I received your letter. I give sincere thanks to your interest in the history of Korean science and also to Professor Price's investigation. I am writing my first letter answering the questions you have asked.

In consideration of Prof. Price's scientific knowledge of the apparatus of astronomical observation in which he is interested, there seems to be, as far as now, neither professors nor students in Korea who can be said to be so professional as Prof. Price. I telephoned Dr. 李源喆 [Yi Woncheol] who had translated the dissertation of Rufus from English, and he answered that he himself was a scholar of astronomy and weather in active service but that he hadn't investigated them from a historical viewpoint.

1. This morning I have confirmed that the most important clock which, according to Rufus, had been preserved by Mr. 金性洙 [Kim Seongsu] is now in possession of 高麗 [Goryeo] University Museum in Korea. I will send you a photograph or film of it as soon as possible.

2. I will tell you about dissertations and books as soon as I find them, though I think you cannot expect much from them. But as for the astronomical apparatus in Korea in the middle ages, I think Rufus availed himself of the documents of 李朝実録 [*Yijo sillok*] and the first and second volumes of 文獻備考 [*Munheon bigo*] or 增補文獻備考 [*Jeungbo munheon bigo*] and so I shall be able to send you a copy of the microfilm. I am trying to find out these books, in which there must be more accurate records. (As I know there are explanations of width, length and height etc. in the records of some other apparatus.)

3. If you need a translation into Japanese or English of that part of 李朝実録 [*Yijo sillok*] and 文獻備考 [*Munheon bigo*] please let me know.

[...here a note is added on Jeon's research into the history of movable type in Korea ...]

God may protect the study of yours and Prof. Price's! I will write to Prof. Price in English next time.

A few weeks later, on February 16, Jeon Sang Woon wrote again in Japanese, this time enclosing ten photographs, of which he said,

Please don't worry about the expenditure of the photograph. As I think it is for me and the study of Korean science history, I am willing to spend money in order to cooperate with and render service to you ... I am afraid these pictures are not good, for I myself took them.

These detailed pictures of the internal mechanism of the device are evidently the photographs that so enthused Derek Price. Jeon also gave a number of important citations of and references to historical sources relevant to the object originally purchased by Mr. Kim Seongsu, which had later been given to the Korea University Museum. In an article many years later,⁸ Jeon explained how it was that the object was originally acquired by Mr. Kim, the entrepreneur and independence advocate who was the founder of Korea University:

It was reportedly in the early 1930s. A unique clock device was being carried on a handcart around the antique markets in the streets of Insadong looking for someone to buy it. It was neither a Goryeo celadon nor Yijo-white porcelain nor a folding screen with a precious painting on it, but rather a large machine. The seller was asking for a high price for it saying it was from a palace and very valuable. But there was no one in Insadong who wanted to buy it. By the end of the evening, people were saying that it would be impossible to sell, when it came into the sight of Mr. Kim Seongsu.

According to what (the late) Mr. Yi Seongui of Hwasan Bookstore told me in the 1960s,⁹ the price asked was equal to that of a house with a tiled roof. At that time, we were saddened by the regrettable history of our country's science-cultural

⁸ Jeon Sang Woon, "Cheonmun sigye 천문시계 (An Astronomical Clock)," *Gwahak donga* 科學東亞 (Scientific East Asia) 9 (1989), 120-123. I owe this reference to Professor Kim Young Wook of the Department of Mathematics, Korea University, Seoul, who drafted a translation; I also thank Professor Lim Jongtae for his advice.

⁹ This was Yi Seongui 李聖儀 (1902-1965), owner of the Hwasan seorim 華山書林 bookshop in the Insadong district of Seoul.

assets, and said that Mr. Kim would be the only person soft enough to buy such an unpopular kind of antique for such a high price.

It is not clear to me whether Jeon Sang Woon was ever made aware of the proposal by Derek Price that the object in question should be “brought to, say, the Smithsonian Institution” through the exercise of “American interest.” But his sentiments about “the regrettable history of our country’s science-cultural assets” suggest that he might not have seen that as the most appropriate way of dealing with the matter. In any case, the object remained in Korea University Museum, where it is still to be seen today.

By the time two more years had passed, it is clear that Joseph Needham had taken up Derek Price’s suggestion that the Korea University device was “worth a good paper” and had shared the news with Jeon Sang Woon, who replied to him in English on 5 June 1964, in a letter that paints all too clear a picture of the difficult circumstances of his life and work at that time – but also of the energy and determination that he was devoting to his self-imposed mission “to study the history of Korean science and technology” [Appendix 1]:

Dear Professor Needham,

I am very sincerely grateful to you for your kind and warm letter, and respect you for your study of the history of Chinese science and technology.

It gives me much courage and strength to study the history of Korean science and technology. As I heard of your highest knowledge about the history of Korean science and technology from Prof. Price and Mr. Ledyard, I hope I can learn many things from you.

Indeed, it is very difficult for me to study a monograph as the history of Korean science and technology under the needy circumstances in Korea.

The economic hardships in Korea wouldn’t let the scholars admit to study their departments as their will. But I will do my best in order to give the peoples in the world to understand the history of Korean science and technology rightly.

I am much surprised and delighted at the news that you have been writing the history of Korean clock-making, which we Koreans don’t touch yet. I would like to help you in many ways that I can. If you want any materials and photographs, I will gladly send them to you.

The other day, I finished the writing of “The history of Korean science and technology in 15th century.” But it is hard for the study to be printed in this state in Korea.

And I am planning the [publishing] of the photographic materials in concern with Mr. Bedini, who is a curator of Smithsonian Institution. But because of wanting of the subsidy for studying, and having no time to arrange about three hundred kinds of photographs and to write their preliminary articles, I cannot help putting it off, day after day. Any way I will try my best. I look forward to get a copy of your book, soon.

Needham evidently wrote to him again in February of the next year, asking for further information, to which he sent the following reply on 10 March 1965:

Dear Professor Needham:

I want to thank you for your kind letter of 5 February, which I was unfortunately unable to reply to earlier. I am sure that your work on the Korean astronomical instruments and clockwork is getting on well.

The two sun-dials, the photographs of which you asked for in your letter, had been in Korea, but one was lost, the other remains broken at Chang Gyŏng Won (昌慶苑). Now I will take a photograph of it, after having it repaired. I think very sorry not to send it to you with these photographs. But it will reach you as soon as possible.

I have once heard about the English translation of my paper in Hyangtho [Hyangto] Seoul (郷土서울) from Professor Ledyard, and he told me to show it when it translated, but I didn't receive it yet. So I am looking for the tutor who was helping him in his studying of Korean Literature.

At present I have your famous books, *Science and Civilisation in China* vol. 1, 2, 3, 4 (part 1), and should like to have the rest, but it is very difficult for me to get them here in Korea. If you kindly let me have them, I would be extremely grateful. I will send the materials you want for the cost.

Sŏn-gi Ok-hyŏng (璿璣玉衡), an astronomical clock made in 1669, which is now displayed at Korea University Museum, was mended by Yi Chin Jŏng in 1687. This fact has been written in my article in Ko Mun Hwa (古文化) No. 2 June 1963.¹⁰

¹⁰ Jeon Sang Woon, "Seongi okhyeong-e daehayeo 璿璣玉衡에 대하여 (On the Astronomical Device [Driven by Clockwork])," *Go munhwa* 古文化 (Ancient Culture) 2 (1963), 2-10. Jeon's dating of the device has since been questioned. Ledyard suggested that the Korea University object might have been a similarly described device said to have been made by Hong Daeyong 洪大容 (1731-1783) [Gary Ledyard, "Cartography in Korea," in J. B. Hartley and David Woodward eds., *The History of Cartography, Vol.2, Book 2: Cartography in the Traditional East*

The results of Jeon's "courage and strength" are shown in his letter to Needham of 1 October 1966, where he proudly announced a new publication:

Dear Professor Needham,

It has been a long time since we were in contact.

I am glad to say that my book 韓國科學技術史 (306 pp.) has published,¹¹ and I have sent you it.

Now, basing on this book, I am going to make the draft, 'Science and Technology in Korea – An illustrated history' in English.

I hope your help and revision when the draft will be completed.

As good as his word, Jeon Sang Woon wrote to Needham a year later 21 September, 1967 with exciting news of progress:

I am sending you a carbon copy of the unfinished description that I am still working on. This is the draft of chapter one, Astronomy of my book, "Introduction to History of Science in Korea."

and *Southeast Asian Societies* (Chicago: University of Chicago Press, 1994), 250-54]. But a number of pieces of evidence can be counted against this, including the fact that unlike the present device, Hong's device did not have a terrestrial globe inside it, but a flat "horizon plate," similar to the one in the seventeenth century Japanese clockwork-driven sphere described in Christopher Cullen and Hiraoka Ryuji 平岡隆二, "The Geneva Sphere: An Astronomical Model from Seventeenth-Century Japan," *Technology and Culture* 60:1 (2019), 219-251; Hiraoka Ryuji and Christopher Cullen, "Junēbu tengi: 17 seiki Nihon no tenmon mokei ジュネーブ天儀: 17世紀日本の天文模型 (The Geneva Sphere: An Astronomical Model from 17th C. Japan)," *Yōgaku* 洋学 26 (2019), 49-78. Ledyard's objections were evidently known to Needham, who never the less follows Jeon's dating, since he has a footnote discounting the "hypothetical possibility" of the Korea University Museum device being that of Hong Daeyong [Joseph Needham, Lu Gwei-djen, John H. Combridge, and John Major, *The Hall of Heavenly Records: Korean Astronomical Instruments and Clocks, 1380-1780* (Cambridge: Cambridge University Press, 1986), 114, note 59]. More recent research, by O Sanghak, has suggested that this device may have been made as late as the nineteenth century, possibly in the time of Crown Prince Ikchong 翼宗 (1809-1830), before the prince became regent in 1827: see O Sang-hak, *Joseon sidae segye jidowa segye insik* 조선 시대 세계 지도와 세계 인식 (Joseon World Maps and Knowledge of the World) (Paju: Changbi, 2011), 193-202. In that case it seems quite possible that such a device could have survived past the end of Joseon and passed into private hands before being offered for sale in the 1930s as a precious object "from a palace."

¹¹ Jeon Sang Woon, *Hanguk gwahak gisulsa* 韓國科學技術史 (A History of Science and Technology in Korea) (Seoul: Gwahak segyesa 科學世界社, 1966).

I shall be much obliged if you will kindly read the proofs for me and please be liberal with your comments and criticisms. Especially, about the translation of terminology and composition of sentences, I need your minute examination and guidance. This project will be almost completed by the end of this year.

It is at this point that we begin to have evidence of the letters that Needham addressed to Jeon Sang Woon.¹² On 6 November 1967 he wrote [Appendix 2]:

I was naturally extremely interested to receive in September last the typescript of your partly finished book on the history of science in Korea. I see that you are doing everything except the purely biological sciences. As I had no time at all to read the typescript for you, I succeeded in persuading my sister-in-law, Miss Muriel Moyle, to do so, and the copy which I am now returning to you herewith contains the small improvements in English style or grammar which she introduced.¹³ I have checked it over, and I agree with the changes made. Both of us, I may say, have been deeply impressed with the almost perfection of the English of your text. If you like to send us the remaining chapters as they become available, for similar polishing of the English style, I am sure that we shall be able to do it. Congratulations are due to you for a splendid work. You need, and you shall have, all the support we can give.

[...] [John.H. Combridge is] collaborating with us on a monograph on the equipment of the palace and observatory of Seoul from the beginning of the fifteenth century. [...]

With warmest regards and best wishes for all success in your work.

Of course the “monograph” referred to at the end of Needham’s letter eventually appeared as *The Hall of Heavenly Records: Korean Astronomical Instruments and Clocks, 1380-1780*.¹⁴ But this book was no exception to the pattern of many of Needham’s projects, for which the time between conception and delivery could be

¹² This may have been because his election as Master of Caius College in 1965 gave him access to regular secretarial support, so that carbon copies of his letters were preserved as a matter of course.

¹³ By “read” here, JN clearly means “proof-read and correct”; his expressions of appreciation show that he has read the manuscript with some attention. Muriel Moyle was a professional copy-editor who worked on all the early volumes of *Science and Civilisation in China*.

¹⁴ Joseph Needham, Lu Gwei-djen, John H. Combridge, and John Major, *The Hall of Heavenly Records: Korean Astronomical Instruments and Clocks, 1380-1780* (Cambridge: Cambridge University Press, 1986).

extremely long – often caused in part by the failure of collaborators to fulfill the optimistic plans made at the inception of the project. Meanwhile, however, Jeon Sang Woon's solitary and persistent work led to Needham receiving a letter from another correspondent.

On March 21 1969, Barbara Levey, a coordinating editor for MIT Press, wrote to Needham:

The MIT Press presently has under consideration for publication a manuscript by Professor Jeon Sang-woon on traditional science and technology in Korea, described more precisely as a historical survey of techniques (particularly chemical technology) and the instrumental aspects of science.

We understand from Professor Nathan Sivin¹⁵ that you are familiar with Professor Sang-woon and his work, and we would find it extremely helpful in reaching a decision concerning publication to know your opinion of the work's merits. I am enclosing a copy of the table of contents for your information, although it probably won't tell you much more than the subjects covered, and if you feel you would need to see the manuscript before giving us a conclusive opinion, we would be pleased to send it to you.

Your comments would be very welcome and we hope your schedule will allow you the time to drop us a note.

Needham's response was swift and decisive. On 15 April he wrote:

I am replying to your letter of 21 March inquiring about the typescript by Professor Jeon Sang-woon on the history of science and technology in Korea. I write to recommend without any hesitation the acceptance of this work by the M.I.T. Press.

I have been in touch with Jeon Sang-woon for a number of years, and was only very sorry that I missed the opportunity of meeting him by not being able to attend the conference which took place in Hong Kong on the history of science and technology in East Asia, during the winter a year or two ago. For the last dozen years my collaborators and I have done everything we could to help Jeon Sang-woon in his unique work at a distance; in fact, I remember correcting the

¹⁵ Nathan Sivin, a leading American historian of science in East Asia, moved from MIT in 1977 to become professor of Chinese culture and history of science at the University of Pennsylvania, where he is now an emeritus professor.

English for him for one of his publications. My collaborators and I have a great admiration for the work that he has done and is doing.

It should be clearly understood that in spite of the great importance of the history of science and technology in Korea for our understanding of the whole development of ancient and mediaeval science in East Asia, there is practically no-one else working on it except Jeon Sang-woon. His studies are completely authentic and reliable as far as we can see, and he deserves every possible encouragement in his work. For example, I should very much like to see him invited out to the West for a couple of years on some well-endowed travelling fellowship so that he could broaden his outlook and gain much stimulation from the work on the history of science going on in the West. In the meantime, I feel quite certain that his work ought to be published as soon as possible, and I would heartily recommend that it should be undertaken by the M.I.T. Press as part of the enlightened publishing policy that we have been long admiring. You will note that I do not feel any need to see the typescript before giving you my conclusive opinion.

It is a mark of the strength of Needham's growing international weight as a scholar that this somewhat unusual recommendation was accepted by MIT Press without hesitation. Their reply on 25 April simply stated:

... we will probably bring the project before our Board shortly for formal approval.

As a measure of compensation for your interest and willingness to advise us, we have arranged to send you an honorarium for \$35 with our thanks.

Jeon's book eventually appeared as *Science and Technology in Korea: Traditional Instruments and Techniques* (Cambridge, MA: MIT Press, 1974).

Despite Needham's hopes, the long delayed meeting with Jeon Sang Woon did not take place in the context of a leisurely sabbatical of travel in western countries. Instead they met in Tokyo, and then again in Kyoto, at that time a favoured destination for historians of science in East Asia while Yabuuti Kiyosi 藪内清 was at the head of the Kyoto University Research Institute for Humanistic Studies [Figure 1]. Jeon wrote from the Institute on 31 October 1974 to say

It was my great pleasure to have a copy of your monumental work [*Science and Civilisation in China*] volume 5, pt. 2. I beg to express my sincere thanks for your book which you kindly presented me.

I write to tell you how much I appreciated making your acquaintance in Japan, and especially for nice discussion we had the Nakayama's¹⁶ dinner party in Tokyo and that of the Sivin's in Kyoto.

I enclose the photographs which I have taken in Tokyo. I will stay in Kyoto by next February for writing the Japanese edition of my History of Science in Korea.¹⁷

I will never forget your kindness.



Figure 1. A party at the house of Nakayama Shigeru, Tokyo, 1974. Left to right: Ho Peng Yoke, Jeon Sang Woon, Song Sangyong, Joseph Needham. The hands carrying the beer are probably those of the yukata-wearing Nakayama Shigeru.

However, earlier in 1974 another significant meeting had taken place, one that showed that Needham's long-delayed Korean project had received a new impetus. On 8 June 1974 a young American scholar, John H. Major, wrote to Jeon Sang Woon, then in Seoul, from Kyoto:

¹⁶ The reference is to the eminent Japanese historian of science Nakayama Shigeru 中山茂 (1928-2014).

¹⁷ This appeared as Jeon Sang Woon, *Kankoku kagaku gijutsushi* 韓国科学技術史 (A History of Science and Technology in Korea) (Tokyo: Kōma shorin 高麗書林, 1978).

Please allow me to introduce myself. I am an assistant professor of East Asian History at Dartmouth College. My special field of research is the early history and philosophical background of Chinese science. In the past I have worked closely with Prof. Nathan Sivin at MIT and also with Dr. Joseph Needham at Cambridge.

Last summer, Dr. Needham asked me to undertake the editing of the materials on medieval Korean astronomy and astronomical instruments that he, Dr. Lu Gwei-djen and John Combridge prepared several years ago with the help of Dr. Gari Ledyard and yourself. Of course I was very pleased to agree to edit those materials, and have been at work on them during the past year.

Soon I will have the opportunity to come to Korea, and would be honored to have the chance to meet you, especially as you are your country's recognized expert in these matters. Perhaps, if you were able to spare the time, we might go to the museum together to examine the wonderful seventeenth-century demonstrational armillary clock that will be the main subject of our study.

I will be in Seoul at least on July 1, 2, and 3. Unfortunately I am not yet sure where I will be staying there, but if you would let me know your schedule, I will be glad to meet you at a time and place that suits your convenience. I very much hope that one of these days will be possible for you.

I look forward to hearing from you soon, and to seeing you soon thereafter.

Jeon replied on 17 June 1974:

It was my great pleasure to receive your letter on June 8. I am happy to hear that Dr. Needham and others are still working on medieval Korean astronomical instruments and you have been at work on them. Of course I will be glad to meet you in Seoul and I am able to spend the time with you at any time. Please call me up at any hotel when you arrive in Seoul. Phone number of my office is 94-0124 (ext. 29) and my home is 99-7168. I am looking forward to meeting you in Seoul soon.

The meeting was evidently helpful to the progress of the project, as shown by a further letter from John Major sent on 14 October 1981, in which he announced:

I'm happy to be able to tell you that *The Korean Royal Observatory, 1400-1760* is now nearly finished and ready to go to the press. It will be published in Nathan

Sivin's East Asian Science series, which as you probably know has now been moved from M.I.T. Press to the University of Michigan Press. I have been here in Cambridge for the past several months, working with Joseph Needham, Lu Gwei-djen, and John Combridge to finish the book, at long last. (All of them are well, and send you their greetings.) It is very gratifying that this book, on which you have given us such valuable assistance over the years, will soon be published.

And Major went on to ask for help in obtaining copies of some images from Jeon's book that were needed for reproduction, and to enquire how his work was going. Jeon replied on 2 November 1981:

It was my great pleasure to receive your letter and to hear the wonderful news about the publish of the *Korean Royal Observatory*. I am sure the book will be published excellently.

I have met Drs Joseph Needham, Lu Gwei-djen and Sivin on the Congress of the History of Science in Bucharest, and heard about the news there. On the way back home, I visited London and Needham's Library in Cambridge for several days. If I knew you were there, I would see you with great happiness.

I am preparing to make pictures of the illustrations you asked for. I will mail them to you as soon as possible.

It is nice of you to have seen my book, the Japanese edition of STK. Thank you for your kind attention. Now I am getting well, and I have been working on the scientific cultural properties in Korea. Perhaps I think it will take several years fully.

I like to let you know that I am going to send some Korean materials written in English to Needham's Library. Please give my best regards to Drs Needham, Lu, Salt¹⁸ and Mr. John Combridge.

But a book that is "nearly finished and ready to go to the press" does not always appear rapidly. The next communication from John Major (undated, but apparently written in the following year, 1982) began as follows:

¹⁸ The reference is to Dr. Michael Salt, who was at that time librarian of the East Asian History of Science Library, the name given to Needham's research collection, then located in a house leased from Cambridge University Press at 16 Brooklands Avenue Cambridge, but now in the Needham Research Institute.

Thank you very much for your letter, and for sending the photographs to be used in our book on the Korean Royal Observatory. They arrived in excellent condition, and we are very glad to have them. Thank you again.

Work on the book is nearly finished, now. Since completing a draft of the entire manuscript last summer, Needham, Lu, Combridge and I have made many corrections and changes, so now I am busy preparing a clean copy of the revised version. Then, I think, it will be ready to go to the publisher. We are all happy to see this work completed after such a long time.

We would like to ask you for one more favor, and if you accept, it will be a great honor for us. We would like to include in the book a title-page in Chinese characters, as well as the English title-page, and we would like most of all to have the Chinese-character title-page in your handwriting.

Could you please write this out for us, with a brush in the traditional style? Please do not be modest about this; I hope that you will say yes. The title of the book in English will be “The Korean Royal Observatory, 1392-1776: The Hall of Heavenly Records.” We thought that a good title in Chinese characters would be 朝鮮王國書雲館史.

Do you think that is alright? Please suggest any changes that you think would be better.

[Major lists the names of the authors in Chinese characters]

I’m sorry I didn’t know that you were in England at the end of last summer. But I think I would have missed you here anyway, because I was in China for a few weeks at that time.

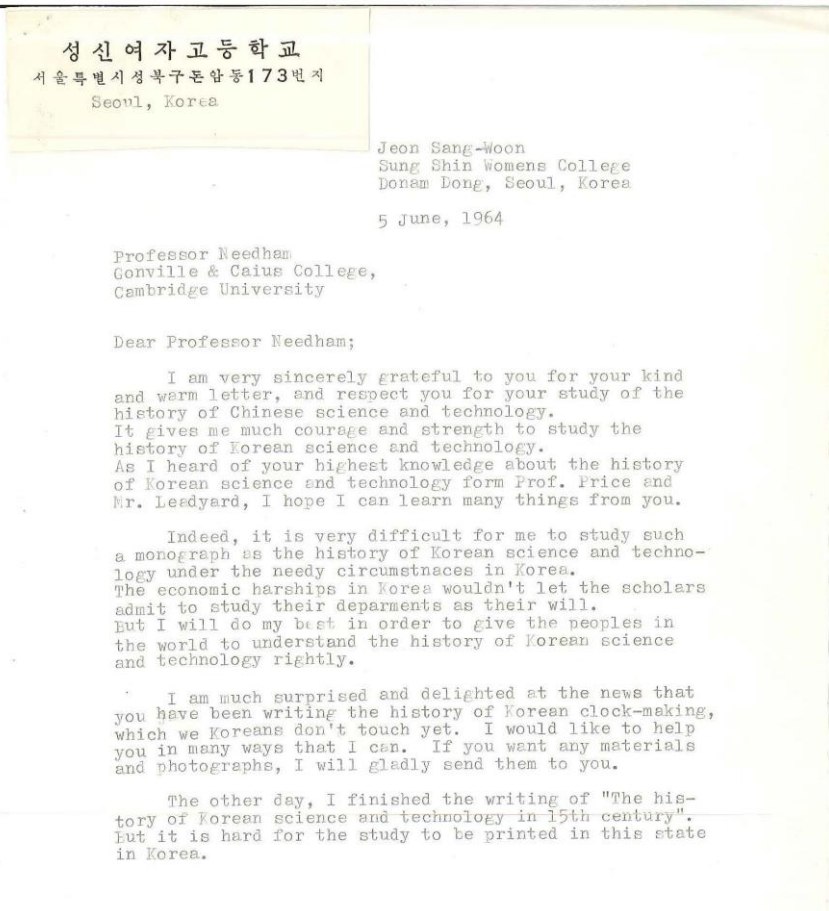
All of us send warm greetings to you, and hope that your work is going well. We look forward to hearing from you.

But when the book eventually appeared five years later, its title had changed to *The Hall of Heavenly Records: Korean Astronomical Instruments and Clocks, 1380-1780* and it was published by Cambridge University Press, rather than by University of Michigan Press. I have not attempted to trace in the archives the events for this change of plans, but a change of publishers alone would clearly explain the delay in the book’s appearance. Surprisingly, the calligraphy for the Chinese title page was not by Jeon, but by Zhou Shiyi 周士一 — a mystery that puzzled me until I learned

from Mrs. Jeon that at the time he received Major's request her husband was in hospital after an operation, and had simply not been in a fit state to take on this task.¹⁹

It is indeed a pity that the long and fruitful scholarly relationship between Needham and Jeon could not have been marked more clearly than it was in the publication of a book to whose creation the latter had contributed so much. But I hope that this article may have done something to redress the balance.

Appendix 1. Letter from Jeon Sang Woon to Joseph Needham, 5 June 1964.



¹⁹ Private communication, Sungshin Women's University, Seoul, 16 November 2018.

And I am planning the publishing of the photographic materials in concern with Mr. Pedini, who is a curator of Smithsonian Institution. But because of wanting of the subsidy for studying, and having no time to arrange about three hundred kinds of photographs and to write their preliminary articles, I cannot help putting it off, day after day. Any way I will try my best. I look forward to get a copy of your book, soon.

with warmest regards,

Yours Sincerely,

전 상운

Jeon Sang Woon

(金相運)

Appendix 2. Letter from Joseph Needham to Jeon Sang Woon, 6 November 1967, in response to the latter sending a draft chapter of his book that eventually appeared as *Science and Technology in Korea: Traditional Instruments and Techniques* (Cambridge, MA: MIT Press, 1974)

6 November, 1967.

Dr. Jeon Sang-Woon,
Sungshin Womens Teachers College,
173 Donam-dong,
Songbuk-gu,
Seoul,
Korea.

JN/MW

Dear Dr Jeon Sang-Woon,

I was naturally extremely interested to receive in September last the typescript of your partly finished book on the history of science in Korea. I see that you are doing everything except the purely biological sciences. As I had no time at all to read the typescript for you, I succeeded in persuading my sister-in-law, Miss Muriel Moyle, to do so, and the copy which I am now returning to you herewith contains the small improvements in English style or grammar which she introduced. I have checked it over, and I agree with the changes made. Both of us, I may say, have been deeply impressed with the almost perfection of the English of your text. If you like to send us the remaining chapters as they become available, for similar polishing of the English style, I am sure that we shall be able to do it. Congratulations are due to you for a splendid work. You need, and you shall have, all the support we can give.

About the English translation which Lu Gwei-Djen and I made, I am sorry that at the present time I am not able to send it to you, for it is over at Oxford in the hands of the Director of the Old Ashmolean Museum who, together with J.H. Combridge, is collaborating with us on a monograph on the equipment of the palace and observatory at Seoul from the beginning of the fifteenth century. If and when I can get a copy made, I may be able to supply you with it, but I trust that the absence of it will not in any way hold up your plans. It seems to me that your book does not need any full translations of text as such, which are more suitable for specialised papers and monographs.

With warmest regards and best wishes for all success in your work,

Yours sincerely,