

GEOGRAPHICAL LOCATION OF SILLĀ IN MUSLIM ASTRONOMICAL LITERATURE OF THE THIRTEENTH TO SIXTEENTH CENTURIES CE

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The Muslim world has been learning about Korea for a long time. Historical evidence shows that some of this knowledge predates the Islamic era; indeed, Iranian merchants have nurtured ties since the era of the Sillā dynasty (57 BCE–935 CE). For centuries after the house's fall, the name stuck: References to Korea as Sillā, Shillā, and Basillā appear in Iranian historical and literary texts until the sixteenth century. By the thirteenth century, however, as Sino-Iranian connections grew, Muslims began to adopt a new name, Kao-li or Korea. Still, astronomers and geographers continued to use the name Sillā, as evidenced in astronomical texts written in the eleventh, thirteenth, and sixteenth centuries. In the fourteenth century, an interesting change in the evolution of the word Sillā occurred: Islamic ephemerides, diaries that chronicle astronomical positions, began to record the name Sillā in the same location along an eastern prime meridian as the toponym Kangdez. The origins of Kangdez—for example, whether it developed from an Iranian or Indian tradition—is unclear. Nonetheless, this widely used dual naming of a single geographical location persisted in Islamic astronomical texts into the sixteenth century. This article traces the transfer of geographical knowledge about Sillā and Kangdez into and throughout the Muslim world through the works of five generations of well-known Muslim astronomers, with a focus on their lesser-known works. It seeks to specify the manner in which astronomical knowledge about the location of Sillā and Kangdez circulated among Muslims from the thirteenth to sixteenth centuries.

Keywords: Korea, Persian Islamic, Islamic, Manuscript, Sillā, Astronomy

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The origin of knowledge about Korea in the literature of the Middle East divides into three basic categories—mytho-historical, geographical, and astronomical. In the first category, mythical narratives about the past concern family ties between Iranian and Korean princes and princesses, in addition to some other kinds of filial relationships. These narratives are the product of pre-Islamic historical relations, a small portion of which the world knows thanks to the *Kush-Nāmeḥ*, a mythical history of Iran in the form of a Persian epic poem written by Ḥakim Irānshān (or Irānshāh) b. Abu'l-Khay between the years 501 and 504 CE (or AH 1108–11).¹ Historical evidence from this epic reveals the origins of its story in events that resulted from historical relations between Iran and the Far East, in particular China and Korea. An important book on Iranian history from the twelfth century, *Moḡmal al-Tawāriḫ W-al-Qeṣas* (Collection of histories and tales, completed 1126 CE or AH 520), refers to *Kush-Nāmeḥ*, which specifically addresses Iranian-Korean connections.² Thus, this book demonstrates the longevity of historical ties between these two countries. Similar examples reflecting the cultural and historical ties between Iran and the Far East can be seen in other poetry books such as *Bahman-Nāmeḥ*³ and *Humāy u Humāyun*.⁴ The combination of myth and history in these poems obscures our understanding of the reality of historical relations between Iran and Korea.

¹ For more information about *Kush-Nāmeḥ* see Hee Soo Lee, *Kush-Nāmeḥ: A Thousand-Year Love Story between a Persian Prince and a Silla Princess* (in Korean) (Seoul: Chong A Publishers, 2014); Hee Soo Lee, “A Preliminary Study on *Kush-Nāmeḥ*, an Ancient Persian Epic and Its Description of Silla” (in Korean), In *Proceedings of the 1500 Years of Korean-Iranian Cultural Encounters Based on the Persian Epic Kush-Nāmeḥ*, Hanyang University, Seoul, 2010, 100–13; Hee Soo Lee, “Kodae P'erūsia sōsasi Kuswiname ūi palgul kwa Silla kwallyōn yōn'gu” [A preliminary study on *Kushnameḥ*, an ancient Persian epic and its descriptions of Silla]. *Han'guk Isūllam hakboe nonch'ong* 20, no. 3 (2010): 99–113; Hee Soo Lee, “A Study of the *Kush-Nāmeḥ* Epic's Characteristics Compared to *Shah-Nāmeḥ*” (in Korean), in *Proceedings of the 1500 Years of Korean-Iranian Cultural Encounters Based on the Persian Epic Kush-Nāmeḥ*, Hanyang University, 2012, 60–84; Hee Soo Lee, “The Significance of *Kush-Nāmeḥ* as a Source Material for Re-interpreting Silla's History” (in Korean), in *Proceedings of the 8th International Seminar on Kush-Nāmeḥ*, Hanyang University, Seoul, 2013, 41–47.

² *Moḡmal-ot-Tawāriḫ va'l-Qeṣas*, Persia, ca. 1475, Heidelberg Cod. Heid. Orient, MS-118, Library of the Heidelberg University Archives, Heidelberg.

³ Inhwa Choi, “The Position and Significance of *Bahman-Nāmeḥ* and *Kush-Nāmeḥ* in the Persian Epic,” in *Proceedings of the 8th International Seminar on Kush-Nāmeḥ* (Seoul: Hanyang University, 2013), 111–31.

⁴ J. C. Bürgel, “*Humāy* and *Humāyun*: A Medieval Persian Romance,” in *The First European Conference of Iranian Studies held in Turin, September 7th-11th, 1987 by the Societas Iranologica Europaea*, Istituto Italiano per il Medio ed Estremo Oriente, Rome, 1990.

The second group consists of travelogues and Islamic geographical texts that contain information about ninth-century Korea.⁵ In these texts, Sillā, Shillā, and Basillā alternate as names for Korea.⁶ The first Muslim references to the East Asian country and its characteristics appear in references to the ninth century in two books, *Silsilat al-Tawārikh*,⁷ a travel book written by a prominent Iranian sailor from the city of Sirāf, and in *Al-Masālek Wa'l-Mamālek*,⁸ in a section on the introduction of sea lanes. Most likely, Islamic society knew about Korea through Muslim sailors who learned directly or indirectly about the country through commercial dealings in Korean or Chinese ports. In the second category, Sillā has been described as a utopia with a wealthy and fortunate citizenry. A significant example of this can be found in Sharaf Zamān Ṭāher Marwzi's twelfth-century book, *Ṭabāy-e Al-Ḥayvān* (The natural properties of animals). In his description of Korea, he writes:

At the furthest end of the Chinese territory lies the land called Sillā. Whichever Muslim or other stranger enters it, settles in it and never leaves it, on account of its pleasantness and excellence. Much gold is found there.⁹

Information from sources in this second category derive from sailing books, that is, until the thirteenth century when the Mongols rose to dominate China and the Middle East. Indeed, a large portion of the information recorded therein concerns the wealth, serenity, and good fortune of the Korean Peninsula's residents.

With Mongol domination of China, Korea, and the Middle East, inter-cultural communication between these three territories entered a new stage of its history. The integrity of the Mongol Empire, whose dominion stretched from the Far East to the Mediterranean Sea, broke down the communication barriers between regions. Increased travel and transport by Eastern and Western merchants—by

⁵ Kei Won Chung and George F. Hourani, "Arab Geographers on Korea," *Journal of the American Oriental Society* 58, no. 4 (1938): 658–61.

⁶ For more detailed information about Sillā in Islamic travelogue and geographical texts, see Mohammad Bagher Vosooghi, "Silla, Bassila or Bosilla: New Findings Concerning Korea from Persian Manuscripts," In *Proceedings of the 1500 Years of Korean-Iranian Cultural Encounters Based on the Persian Epic Kush-Nāme*, Hanyang University, Seoul, 2013, 47–75.

⁷ Abū Zayd Hasan ibn Yazīd Sirāfi (Abu Zayd al-Sirafi), *Silsilat al-Tawārikh*, trans. J. T. Reinaud, in *Relation des voyages faits par Arabes et des Persans dans L'Inde et à la Chine*, ed. L. M. Langlés and J. T. Reinaud (Paris: Impremiere Royale, 1845), 290.

⁸ Ibn Khordādbeh, *Al-masālek wa'l-mamālek*, ed. C. de Goeje (Leiden, 1889), 70.

⁹ Vlademir Minorsky, *Sharaf al-zamān Ṭāhir Marvāzi on China, the Turk and India* (London: The Royal Asiatic Society, 1924), 15.

both land and sea—facilitated exchanges of information that in turn increased Muslim knowledge about the Far East. This was especially true of the Iranian scientists, craftsmen, and merchants who found their way to the court of the Yuan dynasty (1271–1368).¹⁰ At the same time, Mongol and Chinese—most of them merchants, some scholars—visited the courts of the Ilkhānate (1256–1335) in the capitals Marāgheh, Tabriz, and Soltāniyeh. As a consequence of these actions, the exchange of scientific knowledge and information between the East and the West grew during this period. For example, Rashīd al-Dīn Faḍlullāh Hamadānī, the famous Iranian vizier and historian of the Ilkhānate era, consulted Chinese historians and other scholars to compose *Jami' al-Tawārikh*. In other words, Rashīd al-Dīn Faḍlullāh Hamadānī was the first to exploit scholarly knowledge in certain Chinese historical texts to write the history of the East. In his work, Rashīd refers to Korea using Sinitic characters pronounced *gaoli*¹¹ in Mandarin Chinese—often transliterated as Kao-li—and includes factual information. His choice of term differs from many later historical and geographical texts, which used the mythical name Sillā, a toponym that transferred to the Ottomans and then to Greater Mongolia through Persian texts. In these texts, it is clear that in the thirteenth century, Muslim knowledge about Korea consolidated with the increase in scientific and economic exchanges between the East and the West made possible by the Pax Mongolica.

The third category of Islamic sources that contains information about Korea includes Islamic astronomical texts. Referring to the country as Sillā, these works characterize Korea in two ways. In the first example, astronomical books attempting to measure the world identify Sillā's location as they plot the geographical coordinates of important cities. All works of astronomy completed from the early Islamic centuries into the thirteenth century locate Sillā at a longitude of 180 degrees. In the second example, astronomical studies plot Sillā in relation to an eastern prime meridian; curiously, there is a trend in these works, in which the name Sillā gradually gives way to Kangdez, the name of a mythical

¹⁰ An ideal example of emigration by an Iranian astronomer to the court of Kublai Khan is Jamal ad-Din Bukhārī (in Chinese 扎马鲁丁 *zhama luding*), who built seven astronomical tools and dedicated them to Kublai in 1267. For more information, see Song Lian, *Yuanshi* [History of the Yuan] (Beijing: Zhonghua shuju, 1976), 4: 998.

¹¹ Rashīd al-Dīn Faḍlullāh Hamadānī, *Tārikh-e Mobārake Qazāni*, ed. and annot. by Muhammad Raushan and Mostafā Mousavi (Tehran: Mirās-e Maktoob, 2016), 2: 907–908. Professor Hee Soo Lee believes: “As the country name, Korea was introduced to Europe through Muslim merchants who came to Goryo in [the] early 11th century. The first record found was in 1024 in *Goryo-sa* (*Goryo History: Official Korean Annual*) which describes the arrival of a delegation of one hundred from Persia called Tashi (AKA Dashi 大食).” Personal communication.

Iranian castle. In other words Sillā and Kangdez double as two names for one place.

Descriptions of Sillā in these two sets of literature—mytho-historical and geographical or travel—appear in numerous articles published in a variety of languages.¹² Although they have not been able to produce satisfactory results, to some extent these studies have provided answers to fundamental questions. However, more research could be done to analyze the role of Sillā in Islamic astronomical texts and how this toponym for a Korean country came to occupy the same coordinates as Kangdez. Therefore, this article attempts to examine this body of astronomical literature and the attempts by its creators to determine the geographical location of Korea in the thirteenth through the sixteenth century, as well as understand its characteristics.

1. GEOGRAPHICAL LOCATION OF KOREA IN THE ASTRONOMICAL BOOKS OF THE MARĀGHA SCHOOL (THIRTEENTH AND FOURTEENTH CENTURIES)

In his 1966 article, “Late Medieval Planetary Theory,” E. S. Kennedy uses the term “Marāgha School” for the first time.¹³ Regarding the importance of the Marāgha observatory in the astronomical studies written during the Middle Ages, he writes:

Hulāgu, grandson of Genghis Khan, conqueror of Baghdād, and founder of the Mongol Ilkhanate dynasty of Iran, established an astronomical observatory at Marāgha in Iranian Azerbaijan. The scientific activity there was under the leadership of Naṣīr al-Dīn al-Ṭusī (1201–74), a savant of wide interests and varied activities whose work in planetary theory supplied the impetus for the developments here described. Associated with him were a number of astronomers drawn from regions as widely separated as

¹² For more details, see Abū Zayd Ḥasan ibn Yazīd Sīrāfi (Abu Zayd al-Sirafi), *Silsilat al-Tawārikh*, 290; *Hudūd al-Ālam*, preface by V. V. Barthold, translated by V. Minorsky (London: 1937; repr., Frankfurt am Main: Institute for the History of Arabic-Islamic Science, Johann Wolfgang Goethe University, 1993), p. 228; Kei and Hourani, “Arab Geography on Korea,” 658–61; Jong Wee Kim, “The Muslim Image of Korea in the Early Arabic and Persian Literature,” *Annals of Japan Association for Middle East Studies*, no.8 (1993): 373–96; and Hee Soo Lee, *The Advent of Islam in Korea: A Historical Account* (Istanbul: Research Centre for Islamic History, Art and Culture [IRCICA], 1997).

¹³ E. S. Kennedy, “Late Medieval Planetary Theory,” *Isis* 57, no. 3 (1966): 365–78. Marāgha is a city northwest of Iran that used to be the capital of the Ilkhanate dynasty (1256–1335).

China in the East and Spain in the West. It will be convenient to refer to this group as the Marāgha School.¹⁴

In *Tāriḵ-e Mobārake Qāzānī*, the well-known thirteenth-century Iranian historian Rashīd al-Dīn Faḍlullāh Hamadānī wrote: “In view of Möngke Khan’s (1251–59) interest in astronomy, and following Khan’s orders, Hulāgu instructed Khwāja Naṣīr al-Dīn to build an observatory. Seven years after Hulāgu’s accession to the throne, the Ilkhanate observatory was built by four philosophers, namely Mu’ayyad al-Dīn al-‘Urḍī (d. 1266), Fakhr al-Dīn Marāghī, Fakhr al-Dīn Akhlāṭī, and Najm al-Dabīrān Qazvīnī.”¹⁵

Some Chinese astronomers were also present in the court of Hulāgu, who helped Muslim astronomers with the observation of stars. Relying on *History of the Yuan* (Yuanshi), a Chinese imperial court history, we know that the Mongol court accepted some Muslim astronomers.¹⁶ The operation of building the Marāgha observatory began in 1259. Adjacent to it, Hulāgu also ordered the building of a huge library. The core objective was to create a comprehensive book on astronomy based on stellar observation. Headed by Naṣīr al-Dīn al-Ṭusī, the observatory’s research team continued to observe the stars using astronomical tools for a long time. During the rule of Abāqā Khān (1265–82), this research culminated in a book entitled *Zīj-e¹⁷ İlkhānī* (İlkhānī tables), which was then presented to the king of Iran. The National Library of France holds the oldest manuscript version of this book, about which Naṣīr al-Dīn al-Ṭusī writes: “I created this *Zīj-i İlkhānī*, and I am the smallest of servants, Naṣīr, and offered it to the king of the world, Abāqā qā-ān.”¹⁸

Naṣīr al-Dīn al-Ṭusī composed many books.¹⁹ However, among the most relevant manuscript editions available, this study used only two of his well-known books, *Zīj-i İlkhānī* and *Zobdat al-hay’a*. Both of these works stand out as among

¹⁴ Ibid., p. 365.

¹⁵ Rashīd al-Dīn Faḍlullāh Hamadānī, *Tāriḵ-e Mobārake Qāzānī*, 2: 907–908.

¹⁶ Willy Hartner, “The Astronomical Instruments of Cha-ma-lu-ting, Their Identification, and Their Relations to the Instruments of the Observatory of Marāgha,” *Isis* 41, no. 2 (1950): 184–94.

¹⁷ It is well established that the word *Zīj* (Arabic plurals *azīj*, *zīj*, and *zījā*), like a number of other technical terms, assimilated into Arabic from Persian. The stock explanation states that the Persian cognate originally meant a thread or cord, specifically like a bowstring, or a chord in the geometric sense. In modern Arabic, a mason’s line is called a *zīj*. For more information, see E. S. Kennedy, “A survey of Islamic Astronomical Tables,” *Transactions of the American Philosophical Society* 46, no. 2 (1959): 123.

¹⁸ Naṣīr al-Dīn al-Ṭusī, *Zīj-i İlkhānī*, MS-1513, archives of the Bibliothèque nationale de France, Paris.

¹⁹ For more details, see Saliba George, “Naṣīr-al-Din Ṭusi,” in *Encyclopedia Iranica*, online ed. (New York: Encyclopedia Iranica, 2009), <http://www.iranicaonline.org/articles/tusi-nasir-al-din>.

the oldest available manuscripts written during the fourteenth century. In a chapter of *Zij-i Ilkhānī* on the longitudes of cities, Kangdez is said to be located at a longitude of 180 degrees and a latitude of 0 degrees.²⁰ In *Zobdat al-hay'a*, he uses the name Dez-e Kang (castle of Kang) and explains: “The astronomers have positioned the prime meridian in the west . . . as did some Indians in the east. The prime meridian in the east is a place called Dez-e Kang.”²¹ The fact that Naṣīr al-Dīn al-Ṭusī has used this name Kangdez in a genitive case, such as the “castle of Kang,” can help with specifying its geographical location. Where, in fact, was Kangdez located and how did astronomers of the Marāgha School picture it? There is evidence that shows, in astronomical writings of this period and beyond, that the position of Kangdez coincides with the geographical location of Sillā, the name used by Muslims for Korea. As mentioned, Naṣīr al-Dīn al-Ṭusī located the geographical coordinates of Kangdez at a longitude of 180 degrees and a latitude of 0 degrees—in other words, a prime meridian. Referring to Sillā in his book, *Al-Tuhfa al-šāhiya fi'l-hay'a*, Qoṭb al-Dīn Mahmūd b. Ziā al-Dīn Mas'ud b. Moṣleh Shirāzi, a contemporary astronomer and a student of Naṣīr al-Dīn al-Ṭusī, reported: “Sillā is located beyond China, at [a longitude of] 180 degrees west and a latitude of 5 degrees north.”²² Muhyi al-Dīn al-Maghribī, another a famous student of Naṣīr al-Dīn al-Ṭusī and an astronomer of the Marāgha School, locates Sillā at a longitude of 180 degrees west in his book, *Advār al-Anvār*, in a chapter specifying the geographical coordinates of cities all over the world.²³ The book *Tandih al-Tadhkirah al-Nāširīyah* (A commentary on the biography of Nāširīyah), written by a student of Qoṭb al-Dīn Mahmūd Shirāzi named Nizām al-Dīn Hasan al-Nishāburi (d. 1328/9), offers great help to those investigating this subject. He mentions Kangdez and Sillā a few times in this book, a commentary on *Zij-i Ilkhānī* by Khaje Naṣīr al-Dīn al-Ṭusī. He writes: “The Equator begins from the east of the earth and goes past Kangdez and Jamcoot Island, which are areas beyond China.”²⁴ Another part of his book states: “The farthest residential area on the earth in the east is a region called Kangdez, which is the prime meridian of the east.”²⁵ In one of his available manuscripts, the author has drawn

²⁰ Naṣīr al-Dīn al-Ṭusī, *Zij-i Ilkhānī*.

²¹ Naṣīr al-Dīn al-Ṭusī, *Zobdat al-hay'a*, MS-4590, archives of the Library, Museum, and Document Center of the Iranian Parliament, Tehran.

²² Qoṭb al-Dīn Mahmūd b. Ziā al-Dīn Mas'ud b. Moṣleh Shirāzi, *Al-Tuhfa al-šāhiya fi'l-hay'a*, MS-20211, archives of the National Library of Iran.

²³ Muhyi al-Dīn al-Maghribī, *Advār al-Anvār*, MS-5330, archives of the Central Library of Āstān Quds Razavi, Mashhad, Iran.

²⁴ Nizām al-Dīn Hasan al-Nisaburi, *Tandih al-Tadhkirah al-Nāširīyah*, MS-23397, archives of the British Library, London.

²⁵ Nizām al-Dīn Hasan al-Nisaburi, *Tandih al-Tadhkirah al-Nāširīyah*, MS-113, archives of the

a world map in Islamic style, locating Kangdez at the easternmost end of the earth beyond China (see Map 1).

The evidence presented thus far supports the idea that in the thirteenth century, the names Sillā and Kangdez referred to the same location, according to the Marāgha School of astronomy. These astronomers regarded Sillā as the prime meridian in the east, having located it at the longitude of 180 degrees. We know that in the historical memory of Muslims, the name Sillā once referred to what we now call Korea. However, this study will proceed to investigate the origin of the name Kangdez and the astronomical school that used it for the first time.

2. GEOGRAPHICAL LOCATION OF SILLĀ IN ASTRONOMICAL TEXTS OF THE FIFTEENTH AND SIXTEENTH CENTURIES

In the first half of the fourteenth century, a grandson of Tamerlane (founder of the Timurid Empire) named Mīrzā Muhammad Tārāghay bin Shāhrukh but known as Ulugh Beg, who was fond of various sciences including astronomy, ordered the construction of a school and an observatory in Samarkand. The observatory was built in 1420 CE (AH 824), according to Ḥāfez-e Abru, a historian and contemporary of the king.²⁶ Ḥāfez adds that the designer and manager of this observatory was Jamshīd Ghyāth al-Dīn al-Kāshī (fl.1420), one of the greatest astronomers in Iranian history, also called the second Ptolemy.²⁷ It took at least two years for Jamshīd to see completion of the observatory's construction. His colleagues on this enormous project were among the most prominent Muslim astronomers of their time: Moein al-Dīn Kāshāni, Qādī Zāda al-Rūmī (1364–1436), and Ala al-Dīn Ali ibn Muhammed (1403–74)—also known as Ali Qushji. After years of research and observation, Jamshīd and his colleagues eventually managed to create one of the most influential Islamic astronomical calendars in history. In Kennedy's words: "The observatory founded at Samarqand by the astronomer-prince Ulugh Beg worthily carried on the tradition established by the Buyid,²⁸ the Seljuk,²⁹ and the Ilkhanate dynasties."³⁰

Library, Museum, and Document Center of the Iranian Parliament, Tehran; Nizam al-Dīn Hasan al-Nisaburi, *Tawdīh al-Tadbkīrah al-Nāshiriyah*, MS-6544, archives of the British Library, London.

²⁶ Ḥāfez-e Abru Idem, *Zobdat al-tawārik*, ed. S. K. Ḥājj Sayyed Jawādi, (Tehran: AH 1380 [2001]), 2: 955.

²⁷ Ibid., p. 956.

²⁸ The Buyids (also Bowayhids, Buwaihids, etc.; in Persian, Āl-e Būya), a dynasty of Daylamite origin, ruled over the southwestern part of Iran as well as Iraq from the middle of the fourth to the middle of the fifth centuries CE (AH 10th–11th centuries). For more details about the Buyid dynasty, see Tilman Nagel, "Buyids," in *Encyclopaedia Iranica*, vol. 4 (New York: Encyclopaedia

Although he is most famously known as a mathematician, Jamshīd Ghyāth al-Dīn al-Kāshī was also an astronomer. In fact, he is the author of one of the most important astronomical books of the fifteenth century, entitled *Zīj-e Khāqānī*. In the book, he introduces the geographical coordinates of the world's major cities. In one of the oldest manuscripts copies of this book, written in 1413, the names Sillā and Kangdez are placed side by side at the longitude of 180 degrees and the latitude of zero degrees.³¹ The manuscript *Sharh e Zīj-e Ulugh Beg* (The commentary of Zīj-e Ulugh Beg), penned by a student of Qāḍī Zāda al-Rūmī named Alā al-Dīn Ali ibn Muhammed (also known as Ali Qushji), says: "The eastern prime meridian is located in a place called Kangdez."³² It can be understood from the content and commentary in Jamshīd Ghyāth al-Dīn al-Kāshī's book that the author plotted Kangdez and Sillā in the same geographical location that he identified as the prime meridian of the east. In other words, he followed the tradition of his predecessors by equating Sillā, a utopia in Islamic geographical literature, with the mythical Kangdez. Information about the co-location of these two cities extends beyond the parameters of this book. During the same period, Qāḍī Zāda al-Rūmī, another fifteenth-century astronomer and a researcher in the Samarkand observatory, in his book, *Sharh-e al-Mulakḥḥas fi'l-bay'a* (Commentary on Jaghmini's compendium on the science of astronomy), wrote: "The Indian scholars view a place in the east as the prime meridian, calling it Kangdez, and regard it as the furthest inhabited area on the earth, located at a longitude of 180 degrees."³³ Another astronomer in the Ulugh Beg observatory was Alā al-Dīn Ali ibn Muhammed, better known as Ali Qushji. His book, a commentary on *Zīj-i Khāqānī*, notes: "Some Indians have designated a place called Kangdez as the prime meridian in the east, and in the west, the place is now destroyed."³⁴

According to the information provided in astronomical writings about Kangdez and Sillā that equate these two locations, a famous geographer and historian of the fourteenth and fifteenth century drew a map of the world for his

Iranica, 1990), 578–86.

²⁹ The Seljuk was an Iranian dynasty founded by Tughril Beg (1016–63) in 1037. The dynasty dissolved in 1156 after the death of Ahmad Sanjar and disintegrated into several branches that continued their political lives in Anatolia, Kerman, and other regions.

³⁰ E. S. Kennedy, "The Exact Sciences in Timurid Iran," in *The Cambridge History of Iran*, vol. 6 (Cambridge: Cambridge University Press, 1986), 578.

³¹ Jamshīd Ghyāth al-Dīn al-Kāshī, *Zīj-e Khāqānī*, MS- 2692, archives of the Hagia Sophia, Istanbul.

³² Alā, al-Dīn Ali ibn Muhammed (Ali Qushji), *Sharh-e Zīj-e Ulugh Beg*, MS-14691, archives of the Library, Museum, and Document Center of Iran Parliament, Tehran.

³³ Qāḍī Zāda al-Rūmī, *Sharh-e al-Mulakḥḥas fi'l-bay'a*, MS-80802, archives of the National Library of Iran, Tehran.

³⁴ Alā, al-Dīn Ali ibn Muhammed (Ali Qushji), *Sharh e Zīj-e Ulugh Beg*.

book on geography. On this map, he located Kangdez at the easternmost inhabited area on the earth, at a longitude of 180 degrees (see Map 2).³⁵ It must be remembered that the oldest map revealing Kangdez as the world's easternmost settlement can be found in a work held by Princeton University (see Map 3).³⁶ The author of this copy is unknown. The book, written in 1215, indicates that this astronomical notion predates the Marāgha School, and that astronomers of the thirteenth through the sixteenth century followed a common tradition regarding the identical location of Kangdez and Sillā.

3. THE ORIGIN OF THE EQUATING OF KANGDEZ AND SILLĀ

The thirteenth-to-sixteenth-century Islamic astronomical texts examined in the two previous sections show that Muslim astronomers regarded Kangdez and Sillā as the eastern prime meridian. However, Islamic geographical texts and Persian mythical sources contain no such information, and any equation of the location of these two cities appears only in astronomical writings. So what is the origin of this equation? Although we cannot provide a complete answer to this question due to lack of sufficient evidence, certain indirect forms of historical evidence can provide important clues. Therefore, we will incorporate this evidence into our problem statement.

Abu Reyhān Biruni (973–1048) was the first to write about an Indian prime meridian in his book *Tahqīq mā li-l-hind min maqūlah maqbūlah fī al-'aql aw mardbūlah* (The book confirming what pertains to India, whether rational or despicable). He explains:

Hindu astronomers determine the longitude of the inhabitable world by Lankā, which lies in its center on the equator, whilst Yamkoṭī lies on its East, Romaka on its west; Yamkoṭī is, according to Yakūb and Alfazāri, the country where is the city Tāra within the sea. I have not found the slightest trace of this name in Indian literature. As Koṭī means “castle” and Yama “the angel of death,” the word reminds me [that] Kangdez, which, according to the Persians, had been built by Kaikāvus or Jam in the most remote east, behind the Sea, for Dez means in Persian castle, as Koṭī in the

³⁵ Hāfez-e Abru, [Geography], MS-840, Golestan Palace Library and Archive, Tehran. (“Geography” is the title under which this map is filed.)

³⁶ *Kitāb fī Mukhtaṣar al-hay'ah wa-al-mafātīh*, MS-5025, archives of Princeton University, Princeton, NJ, USA.

Indian language. Abumáshar of Balkhi has based his geographical canon on Kangdez as the zero of longitude or first meridian.³⁷

According to Abū Rayhān Al-Bīrūnī, Persian astronomers followed the Indian instead of the Greek tradition of astronomy when designating the location of the eastern prime meridian in a place called Yamkoṭī. Al-Bīrūnī assumed that, in the works of Iranian astronomers, the name Kangdez is in fact a translation of the word Yamkoṭī. Therefore, he believed that the source of the toponym Kangdez must be traceable in the Indian astronomical tradition. Two other documents confirm Al-Bīrūnī's conjecture: The first is a Zoroastrian religious manuscript, a Persian translation of pre-Islamic Zoroastrian texts kept in the library of the Iranian Parliament. The text introduces Kangdez as "one of the regions of the world."³⁸ This signifies that Kangdez assumed a high position in pre-Islamic Iranian thought. Another piece of historical evidence is found in an astronomical manuscript entitled *Sharḥ-e Resālah fi'l-bay'a* (Commentary on *The Compendium of Plain Astronomy*), written by the well-known Muslim astronomer Sharaf al-Dīn Maḥmūd ibn Muḥammad ibn 'Umar al-Jaghmīnī al-Khwārizmī Jaghmīnī. He mentions Kangdez in two sections of his book. In the first, a section on prime meridian, he states: "A place called Kangdez is regarded as the prime meridian, and it is the last inhabited area in the east, located at the longitude of 180 degrees east." In the second, in a section describing cities located on the Equator, he adds: "The Equator crosses an island called Kangdez, and then an island that the Indians call Yamkoṭ, which is the last inhabited city in the east of the world."³⁹ In other words, Jaghmīnī introduces Kangdez and Yamkoṭ as two places co-habiting in a single geographical location at the eastern ends of the earth. This confirms Al-Bīrūnī's view regarding the Indian origin of the word Kangdez: that the word Kangdez is most likely a translation of the word Yamkoṭ in the pre-Islamic Iranian astronomical tradition or prime meridian of the Indian tradition. From there, the word found its way into Islamic astronomical texts. Therefore, the Persian and Indian toponyms Kangdez, Sillā, and Yamkoṭ refer not only to the same place but also to identical coordinates. All three names earned the prime meridian designation in the thirteenth-to-sixteenth-century astronomical texts

³⁷ E. C. Sachau, ed. and annot., *Al-Beruni's India* (Delhi: S. Cahud, 1888), 1: 303–304.

³⁸ *Jong-e Ravāyat-e Dinī va Tarīkhi-e Zartoshti* [Collection of religious and historical narratives of Zoroastrianism] MS-86908, archives of the Library, Museum, and Document Center of the Iranian Parliament, Tehran.

³⁹ Muḥammad ibn 'Umar al-Jaghmīnī al-Khwārizmī Jaghmīnī, *Sharḥ-e Resālah fi'l-bay'a* [Commentary on *The Compendium of Plain Astronomy*], MS-9545, archives of the British Library, London.

presented here and in some maps by Muslim geographers. The Indian origin of the name Kangdez and its translation into Persian brings us to the conclusion that Yamkoṭ might be the Indian translation of a Korean name. Hopefully, further research will bring the actual origin of this name to light.

4. CONCLUSION

This examination of Islamic astronomical texts produced during the thirteenth through the sixteenth century shows that the three toponyms Kangdez, Sillā, and Yamkoṭ most likely refer to the same geographical location. In Indian and Islamic astronomical traditions, Kangdez and Yamkot are both known as the prime meridian of the east. The maps drawn by Muslim geographers confirm this assumption by their scholarly counterparts. Although the mythical name Sillā transformed into Kao-li in the thirteenth century, due to the consequences of expanding Muslim interactions with the people of East Asia, it remained widely used in astronomical writings. The geographical location of Sillā in Islamic astronomical texts also came to apply to Kangdez and Yamkoṭ, both of which Indian and Iranian astronomers regarded as marking the prime meridian. Historical evidence shows that Kangdez is the translation of the Indian word Yamkoṭ, and its sources must be sought in the literature of astronomical thought in ancient India. The assumption that Yamkoṭ is the translation of an ancient Korean name is also plausible. However, there is not enough historical evidence, nor are there enough historical sources, to support a more certain assertion.

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