

The Interaction between Premodern Geographical Perceptions and World Cartography: Ptolemy's *Geographia*, *Gujin Huayi Guyu Zongyao Tu* and al-Idrīsī's *Tabula Rogeriana*

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Introduction

For anyone who lives in modern and contemporary times, the term “world map” has meant an illustration depicting the entire surface of the Earth. This idea of a world map having to depict the whole Earth is, within the history of cartography, a very new one, limited to our modern and contemporary world, for in premodern times, “world maps” were charts depicting various worlds according to their own worldviews.

That is to say, the era of world maps created according to specific worldviews was a far longer time than our modern and contemporary one, but that is not to say that their depictions of the world were exercises in self-righteous attitude. In every region during premodern times, the “world” was always composed in terms of “we-they” or “internal-external” boundaries. For example, even in the case of a map or depiction of the world based on a unique worldview, interest would have to be directed to “the other” or the “outside” and geographical information pertinent to that entity collected. This is even true of premodern (dynastic) China, with its dyed-in-the-wool idea that it was the “middle kingdom,” the center of the Earth.

The present article is concerned with examining the exchange and assimilation of geographical and cartographical information through an analysis of three representative maps of the world drawn in quite different times and spaces. The three maps in question are 1) the world map contained in Ptolemy's *Geographia*, representing the worldview of Western classical antiquity, 2) *Gujin Huayi Guyu Zongyao Tu* 古今華夷區域惣要圖 (Comprehensive Map of China and Barbarian Lands Present and Past), drawn during the Song Period to premodern Chinese standards and 3)

to us through copies of *Geographia* made by scribes of the Byzantine Empire and the Islamic World. The work was then reintroduced into Europe during the early 15th century from Byzantium and became a very useful reference in the so-called “Age of Discovery” that unfolded from that time on. The work was then reprinted throughout Europe, reaching a total of 37 different versions by the end of the “Age of Discovery” at the close of the 16th century.¹⁾ Figure 1 is Ptolemy’s “World Map” from the version printed in Venice in 1564.

I-1. The Ancient and Modern Characteristics of Ptolemy’s “World Map”

Despite the fact of being drawn in the ancient age at Alexandria, Ptolemy’s “World Map” not only reflects those times, but also displays what could be called “modern” elements. To wit,

- 1) While the maps of the ancient and medieval ages are normally depictions of the world according to various worldviews,²⁾ Ptolemy’s map exhibits the unique absence of any specific worldview.
- 2) In an age in which the conventional wisdom considered the world “to be flat,” Ptolemy’s map depicts a world that is round.
- 3) While presenting a pseudo-conic projection for the purpose of rendering a globe in a two-dimensional illustration, Ptolemy’s map is the first in recorded history to confirm the geographic position of a particular point by proposing latitudes and longitudes. As the standard reference lines, the map sets the Equator for latitude and the Ferro Meridian through Ferro Island which lies in the westernmost of the Fortunatae Insulae (Canary Islands) off the Atlantic Coast of western Sahara for longitude. The world recognition of the Equator and Ferro Meridian as prime meridians was followed in Europe for a long time even after the reintroduction of Ptolemy’s map in the 15th century. When the drawing of world maps was revived in Japan during the late premodern period, exerting the greatest influence on the work was Matteo Ricci’s *Kunyu Wanguo Quantu* 坤輿萬國全圖 (Complete Map of the Countries of the Earth) printed in Beijing in 1602 (Wanli 萬曆 30). The prime meridians of Ricci’s map were also set at the Equator and the meridian through “Fudao” 福島 (Canary Islands). Even in early premodern Japan, the world maps following *Kon’yo Bankoku*

Zenzu (Kunyu Wanguo Quantu) have adopted these prime meridians.

- 4) Ptolemy's map included only the "known world," meaning only those points that had been confirmed by latitude and longitude. That is to say, he drew a world map of the "known world" consisting of from 16° to 63° latitude and up to 180° longitude.

These modern characteristics are of course accompanied by many ancient characteristics. Of these latter, here we will take up only the depiction of the Indian Ocean. At present, the Indian Ocean is connected to the Pacific Ocean in the east by a number of straits running between the Malay Peninsula, the Greater Sunda Islands and so forth, while in the south, it is perceived as a great ocean which opens wide into the Southern (Antarctic) Ocean. However, as shown in Figure 1, Ptolemy's map depicts the Indian Ocean as a huge inland sea enclosed on all sides by continents. This "landlocked" depiction, which diverges so widely from our modern perceptions, contrasts sharply with the above-mentioned modern characteristics of the map.

I-2. Ptolemy's Map and Gradation of Perception toward the East

This section will take up the issue of why Ptolemy's map depicts the Indian Ocean as being landlocked, assuming that the Greek geographer had a very good reason for doing so. To begin with, when examining this landlocked condition from the four compass directions, in the north there is the Asian continent and in the west the African continent, suggesting that this arrangement was as obvious then as it is today. The problem is posed by the barriers in the south and the east.

With respect to the south, in the main text of *Geographia*, Ptolemy states that the Indian Ocean is landlocked by a continental extension from Ethiopia to the Ocean's southwest extremity.³⁾ The version of Ptolemy's map preserved at the Biblioteca Nazionale di Napoli, which was drawn before 1470, designates this continental extension as "Terra Incognita," which was the prototype for the later hypothetical southern continent known as Terra Australis Incognita or Megalania. Incidentally, the name Australia derives from this same Terra Australis of geographical imagination. Matteo Ricci's *Kunyu Wanguo Quantu* and all of the maps of late premodern Japan based on it included Megalania (Heiwalanijia 黑瓦臘尼加) in their world depictions.

In the background to the Terra Incognita, extending east and west and bordering the southern edge of the Indian Ocean, lies a spatial perception prevalent in ancient Greece. It is a perception that searches for harmony in symmetry and imagines a world harmonized based on symmetry. For example, in Volume II of Herodotus's *Historiae*, the Inthros (Danube) and Nile Rivers are both described as streams whose channels and mouths run symmetrically north-south.⁴⁾ The perception of the world based on symmetry, when confronted with the Asian continent extending east and west along the northern coastline of the Indian Ocean, would no doubt conceive the existence of another continental land mass extending likewise east and west along the southern coastline. Ptolemy's map seems to reflect this same spatial perception.

Turning to the land mass enclosing the Indian Ocean in the east, in Ptolemy's time, the Ocean's western part, in particular the Arabian Sea, where overseas trade flourished, was called the Erythraei Sea. Assisting this trade activity was the seasonal wind prevailing Indian Ocean in summer known as Hipparkhos, or what we know today as the southwest monsoon. The activity in which the monsoon was utilized not only generated great economic profits, but also enabled the accumulation of geographical information and knowledge concerning the world of the Orient. Of course, such information and knowledge tended to decline in both quantity and quality in direct proportion to how far east the region in question was situated, and we could clearly understand the distance decay relation of eastern perception in Ptolemy's map.

That is to say, the closer the distance is to Ptolemy's home city of Alexandria, the closer its features resemble their actual form: for example, the Red Sea and the Arabian Peninsula. However, further east beginning in the region around the Persian Gulf, depiction of the coastal line shows rather distortion of actual shape. In the further east, the Indian Sub-Continent, we encounter not the inverted triangular peninsula we have all come to know jutting out into the Indian Ocean, but rather a fairly crooked east-west coastline with a huge island floating in the south. The island, Taprobanae Insulae, is for Ptolemy the Earth's largest archipelago, and is thought to correspond to the present-day island of Sri Lanka.

Continental India is demarcated with the Indus River on its west edge and the Ganges River on its east edge. As we proceed further east past the Indus River, the number of place names gradually decreases. Ptolemy establishes the Ganges River as the boundary line dividing the Orient into two areas. One is India Intra Gangem Fluvium (India inside of the Gan-

ges River) and the other is India Extra Gangem Fluvium (India outside of the Ganges River). This areal division has been followed through the “Age of Discovery” by Western explorers. In 18th century, based on Ptolemy’s division, “Fore-India” and “Back-India” dichotomy was formed.

India Extra Gangem Fluvium encompassed almost all of present day Southeast Asia; and to the east of that region, Ptolemy charts a huge land mass by the name of Chersonesus Aurea, the Golden Peninsula. This name is based on the tradition handed down the classical Greek times of “the existence of gold producing region at the end of the Earth.” Ptolemy himself writes about the island of Iabadiou south of Chersonesus Aurea, which produces prodigious amounts of gold.⁵⁾ The eastern side of the peninsula is divided into Serica (the kingdom of Silk) in the north and Sinarum in the south, both of which would become terms designating China in ancient Rome.

It was in this way that Eastern part of Asia, the farthest region from Alexandria, deteriorated in Ptolemy’s map to virtually unrecognizable proportions, from a “falsely similar” correspondence to present-day South Asia to an India Extra Gangem Fluvium bereft of any conformity whatsoever. We can only conclude that Ptolemy’s geographical cognition about the Orient encountered its limits somewhere in the present western Indian Sub-Continent.

These same limits of Ptolemy’s time are also readily apparent in the work *Periplus Maris Erythraei*, written sometime during the latter half of the 1st century CE by a Greek merchant based in Egypt recording his activities in the Indian Ocean, including the sea routes and waterways he traveled, the ports he visited and information about trading customs and trade commodities. The narrative concerning South Asia is most detailed concerning the port city of Barygaza,⁶⁾ or Bharukaccha in the ancient Indic sources and present-day Bharuch, situated at the mouth of the Narmada River.

South from Barygaza *Periplus Maris Erythraei* lists a cluster of port cities located on the west coast of the Sub-Continent, the last of which is called Mūjiris, described as a prosperous port visited by ships from Arīakē (northwest India) and Greece alike.⁷⁾ Mūjiris has been identified as Kodungalur on the northern bank of the Periyar River at a location of 10° north latitude on the Malabar Coast. The port’s prosperity is lauded in an ancient Tamil poem, “Roman ships bearing gold coins churn the waters of the Periyar River to reach the port, fill their cargo bays with pepper and depart. Mūjiris is bustling.”⁸⁾

After listing the trade commodities of the port cities in the vicinity of Mūjiris, *Periplus* touches upon Komorrei (Cape Comorin, present-day Kanyakumari) on the southern tip of the Sub-Continent, but very briefly, suggesting that the eastern limits of advance by the traders from the Mediterranean world went no farther than Cape Comorin. Regarding points east, there is mention of the Ganges River and Chryse, Ptolemy's "Golden Peninsula," which is called an uncharted region that could be reached on with greatest of difficulty.

Comparing the entries and depictions of the Orient in *Periplus* and Ptolemy's map, the greatest discrepancy concerns what lies to the east of Chryse. *Periplus* merely calls it uncharted, while Ptolemy describes a land mass connecting two northern and southern continents which hem in the Indian Ocean. Assuming *Periplus* to be a gazetteer based on information about actual trade and maritime navigation opens the possibility of looking upon Ptolemy's depiction of the coastline girdling the Indian Ocean as mere speculation. However, in the opinion of this writer, such is not the case, for there is a basis for making the argument for a landlocked Indian Ocean.

I-3. Assumptions about a Landlocked Indian Ocean in the Chinese Historiography

When considering the existence of an eastern edge of the Indian Ocean, one should consult the historical sources of China, specifically the entries on 'Yue Di' 粵地 (the Land of Yue province) in the "Dilizhi" 地理志 (Geography) section of the *Hanshu* 漢書 (History of the Han Dynasty), which was written in the 1st century around the time of Ptolemy. The ancient place name, Yue, which indicates the area encompassing present day Guangdong 廣東 (aka Canton) and Guangxi 廣西 Provinces, was a region opening onto the South Seas, which could be termed "maritime China." The 'Yue Di' entries describe the itinerary through this maritime region as follows,

Proceeding south from Xuwen 徐聞 and Hepu 合浦 [on the Leizhou 雷洲 Peninsula across from Hainan 海南 Island] by sea for five month brings one to the kingdom of Duyanguo 都元國. The kingdom of Yilumoguo 邑廬沒國 can be reached after another four-month sail, and the kingdom of Shenliguo 諶離國 in the course of another twenty days. From there, a journey of ten days overland brings one to the

kingdom of Fuganduluguo 夫甘都廬國. From Fuganduluguo it takes over two months by ship to reach the kingdom of Huangzhiguo 黃支國, whose inhabitants resemble Zhuya 珠崖 (Hainan Island) in their customs... South of Huangzhiguo lies the kingdom of Yichengbuguo 已程不國, from which Chinese official interpreters were sent back.⁹⁾

With the exception of Huangzhiguo, both the reading and identification of the place names on the above itinerary are fraught with difficulty. Huangzhiguo has been identified as Kanchi (Kanchipuram) located inland southwest of Chennai (Madras) and about 65km upstream from the mouth of the Palar River and the Bay of Bengal. Therefore, we at least know that the journey described in the *Hanshu* proceeded from the coastal area of Huanan 華南, China, to the Malay Peninsula, overland to the Bay of Bengal and on to points on the southern tip of the Indian Peninsula.

In the itinerary quoted above, we can find two unique characteristics of the journey from Shenliguo to Fuganduluguo. One is that, though all the other journeys are described by sea routes, only this section is by overland route. The other is the distance of this journey. It is just ten days, the shortest among the journeys mentioned in the text. Based on these two peculiarities, we can identify this short ten days' overland route as the road which traverses the Kra Isthmus in the northern Malay Peninsula. Then, the 'Yue Di' entries describe the shortest overland route began after turning west from the southern tip of the Indochina peninsula and landing on the Malay Peninsula to cross the Kra Isthmus to the Kra River estuary, which empties into the Andaman Sea, where the sea voyage continued west across the Bay of Bengal to Kanchi and points south.

Supplementing this interpretation are the known trade routes from South Asia to destinations east. During the 1st century CE, when the *Hanshu* was completed, the general trunk route connecting the Bay of Bengal with the South China Sea was not directed through the Strait of Malacca like it is today, but rather over the Kra Isthmus to the Gulf of Thailand. The scholars on archaeology of Southeast Asia call it the "Gulf of Thailand Route."¹⁰⁾

This route according to the *Hanshu* involved the cumbersome task of unloading ship cargoes for an inland portage trek over the Kra Isthmus through the mountains. Taking the longer, indirect route through the Straits of Malacca was one way of avoiding this annoyance, which

prompts one to ask why such an inland route was chosen in the first place. It was probably because the sea becomes difficult going in the Straits of Malacca in terms of both climatic and human aspects. The Strait is located just below the Equator, where throughout the year high temperatures cause updrafts which form low pressure zones. In addition, the region's wind conditions are characterized by the doldrums. It was for this reason that the Straits of Malacca were so difficult for sailing ships dependent solely on wind power to navigate. However, the Malacca Straits present an excellent base of operations for pirates. Both coasts along the Straits are lined with small river mouths covered by tropical rain forest, affording excellent hideouts and self-sufficient habitats for potential marauders. This was another reason for choosing the Gulf of Thailand Route and the trek over the Malay Peninsula.

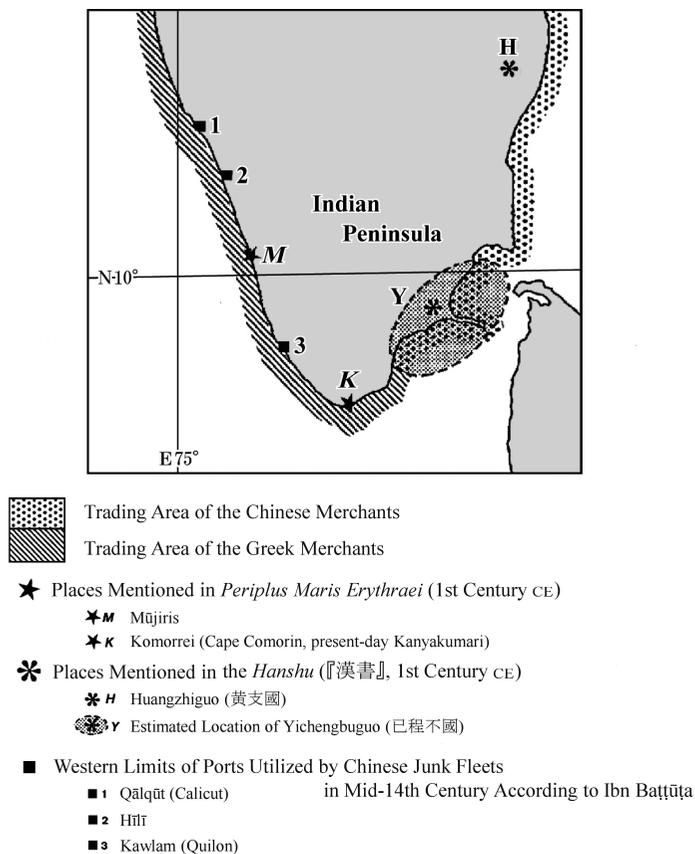


Fig. 2 Encounter of the Greek and Chinese Traders in South India, around the 1st Century CE

Evidence is provided by the excavation of agate and carneol beads, which were a very important Indian-made trade commodity during the time in question, from archeological sites on the Kra Isthmus, the north coast of the Gulf of Thailand and the coastline of Vietnam, while sites along the Straits of Malacca have produced none to date. The Straits of Malacca would become the trunk trade route only in the 7th century, when its coastlines were brought under control by the Hindu empire of Srivijaya, which provided the security necessary for safe navigation through the region.

Returning to the *Hanshu* narrative, south of Huangzhi (Kanchi) lay Yichengbuguo, from where Chinese official interpreters were sent back to China.

This description is interesting. Since Yichengbuguo is situated south of Kanchi, it must have been located on the southern tip of the Sub-Continent; and as the point at which the Chinese official interpreters were sent home, Yichengbuguo must have been a polity where Chinese was understood, indicating the western limit of the activities of the peoples from China. Together with the interpretation based on *Periplus Maris Erythraei* that the vicinity of Cape Comorin marked the eastern limit of the trading sphere enjoyed by Western merchants, we can conclude that already in the 1st century CE, the southern tip of the Indian Sub-Continent formed a kind of boundary point beyond which neither Westerners had ventured east nor Chinese had ventured west, but also where Westerner and Chinese came into contact. This point of “division and contact between East and West” would continue to play such a role until the coming “Age of Discovery.” For example Ibn Baṭṭūṭa, who visited the area in the mid-14th century, recorded that the western limits of Chinese junk navigation are marked by the three ports of Hīlī, Qāliqūt (Calicut) and Kawlam (present day Quilon), which are located on the southern Malabar Coast just around Cape Comorin.¹¹⁾ The region west into the Arabian Sea was the sphere of activity of the fleet of Arab dhow vessels; and it was probably there that traders and navigators from East and West exchanged all kinds of information, beginning with the nature of the commercial environment and no doubt including knowledge about itineraries to and from the southern tip of the Sub-Continent.

Indeed, for Greek merchants, who had been told by *Periplus Maris Erythraei* that the Orient is uncharted, stories from their Chinese counterparts of a route further east that required overland portage of cargoes must have been very informative. Based on such information, it would not be

strange at all for the Western mind to conclude that the Indian Ocean was landlocked to the east. Ptolemy could very well have assimilated such Chinese-based information about the Gulf of Thailand Route in drawing his map. It would be rather ironic if Ptolemy did obtain such knowledge through the contact among East-West traders in the Indian Ocean only to incorporate into his map a land mass blocking the Indian Ocean in the east.

II. *Gujin Huayi Guyu Zongyao Tu*: An Illustrated Legitimization of Ideas Regarding Chinese Kingship

We have already pointed that one of the modern characteristics of Ptolemy's map that makes it such an exception within the cartography of the ancient and medieval worlds is its attempt to depict the world free of the author's personal world view.

This section will take a world map that is not at all exceptional in that respect, by its accuracy in faithfully depicting the particular worldview of its author. This is *Gujin Huayi Guyu Zongyao Tu* (Comprehensive Map of China and Barbarian Lands Present and Past) shown in Figure 3, which occupies the beginning of Shui Anli's 稅安禮 *Lidai Dili Zhizhang Tu* 歷代

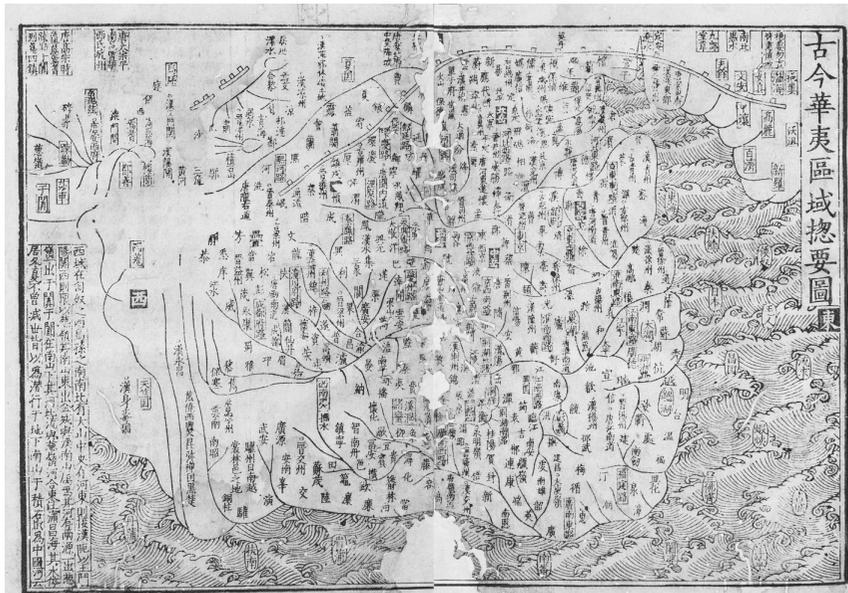


Fig. 3 *Gujin Huayi Guyu Zongyao Tu* 古今華夷區域摠要圖 (c. 1140),
from *Lidai Dili Zhizhang Tu* 歷代地理指掌圖 Stored at Toyo Bunko (XI-1-3)

地理指掌圖 (Concise Atlas of Historical Geography).¹²⁾ This atlas is the oldest printed collection of maps in existence, completed around 1140, during the early years of the Southern Song 南宋 Dynasty's Shaoxing 紹興 Era.¹³⁾ The Shaoxing Era also marks the beginning of the printing and publication of maps in Chinese history as well as in the world.

II-1. The Chinese View of the World: *Tianyuan Difang* (The Heavens are Round, the Earth Square) and the *Hua-yi* Dichotomy

The worldview expressed in *Gujin Huayi Guyu Zongyao Tu* is not religious, but rather filled with ideas about Chinese kingship. It depicts the world according to the fundamental Chinese perception of the heavens as round in shape (*tianyuan* 天圓), and the earth as rectangular in shape (*difang* 地方), within which the latter is divided into civilized and uncivilized territories based on the unique Chinese *hua-yi* 華夷 dichotomy generally discriminating between “civilized” Han and “barbarian” non-Han peoples. It is on the basis of such ideas that we will attempt to interpret the map.

Tianyuan difang:

The *Gujin Huayi Guyu Zongyao Tu* has been drawn with the north at the top, which tells us that the compass was probably a Chinese invention. However, designating the top of the map as north is also an expression of the idea in Chinese kingship of *tianzi nanmian* 天子南面, that the emperor stands in the north and faces south. The compass is a device for indicating the emperor pointing south (*zhinan* 指南).

The *Gujin Huayi Guyu Zongyao Tu* depicts a nearly rectangular continental mass with seas to the east and south. This continental mass corresponds almost identically to the territory of China, adding on the periphery such regions as the Korean Peninsula. The map's composition itself is also a direct expression of the Chinese worldview in which the cosmos is comprised of “Heaven” (*tian* 天) and “Earth” (*di* 地), the former round, the latter rectangular.

The conceptualization of a round celestial configuration should be understandable for anyone who has ever gazed up at the stars on a clear night, but such is not the case for imagining a rectangular earth, for a mere glance as the horizon reveals the same round configuration as the

heavens. Contrary to what can be readily observed, in the backdrop of this rectangular worldview of the earth lies a spatial perception about the form of the world which the Han people inhabited, a form that is not apparent when looking at any contemporary survey map of China. This is because the present-day People's Republic of China has appropriated the national territory established by the Qing 清 Dynasty, which during the 17th and 18th centuries annexed such non-Han territory as Mongolia, Xinjiang and Tibet. If we exclude these non-Han territories from the Chinese mainland, what remains is a vertically elongated rectangular land mass, as depicted in the *Gujin Huayi Guyu Zongyao Tu*. It is likely that the worldview of the round heavens and rectangular earth was conceptualized together with the realization that the Han territory proper was rectangular in shape.

The highest point on the hemispheric “round heavens” is called *tianji* 天極, which is “the center of the heavens” where they are ruled by *tiandi* 天帝 and from which a cosmic axis runs in the direction of the “center of the Earth” as a conductor of energy (supernatural celestial power) to earth. Standing as the “center of the earth” and receiving this energy and the commands of *tiandi* is his child, *tianzi* 天子, the emperor of China. From a reverse perspective, the point where *tianzi* stands is the “center of the Earth” and the location of imperial capital of China.

Accordingly, the *Gujin Huayi Guyu Zongyao Tu* contains the place name Dongjing 東京 (eastern capital) almost in the center of the rectangular portion of its continental land mass. Dongjing, named in contrast to the western capital of Xijing 西京 (western capital), the name for Luoyang 洛陽, indicates Kaifeng 開封, the capital of the Northern Song Dynasty. Although the actual location of Kaifeng proper is a little north of the exact center of Han territory, the *Gujin Huayi Guyu Zongyao Tu* nevertheless designates Dongjing as the “center of the Earth.” All of these concepts—round heavens, rectangular earth, *tiandi* and his child *tianzi*, the centers of the heavens and earth, and the cosmic axis connecting the two—all resonate against the backdrop of the fundamental polarity of the heavens and earth.

The *hua-yi* dichotomy

The cosmic energy that is conducted into the center of the Earth is linked to the virtue (*de* 德) of *tianzi* and then distributed to its four corners. Since this energy is at its most intense level at the “center of the Earth,” the imperial capital is a place filled to the brim with that energy and the

virtue of the emperor. As both this energy and virtue diffuse outward towards the periphery, they gradually decline in intensity, eventually reaching zero. This zero point where cosmic energy and imperial virtue end corresponds to the boundary separating the world of *hua* 華 (civilization) and that of *yi* 夷 (barbarism). The *Gujin Huayi Guyu Zongyao Tu*, as the name implies, is fully conscious of this boundary line in its intention to present a comprehensive illustration of the two spheres from antiquity to the present.

II-2. The World of *Hua*: Resonating with Heaven and Consecrating the Earth via the Mountains

Those who founded the dynasties of China did not conquer the world merely by military force, but rather founded them according to commands issued from Heaven, that is, *tiandi*. Those who succeeded in establishing dynasties by virtue of receiving the order of Heaven, were called *tianzi*, the children of *tiandi*. The founders of dynastic China reported these successes to *tiandi* by conducting state ceremonies where they prayed for the security and longevity of their dynasties. These ceremonies were conducted at the summit of the mountains, which have an especially important place in Chinese cosmology. It is at this special point where we will commence our analysis of the depiction of the world, or sphere, of *hua* presented in the *Gujin Huayi Guyu Zongyao Tu*.

The map locates for us Zhongyue 中岳 (Central Peak) just west of Tongjing, the center of the Earth, and Dongyue 東岳 (Eastern Peak), Nanyue 南岳 (Southern Peak), Xiyue 西岳 (Western Peak) and Beiyue 北岳 (Northern Peak) at various remote distances from the center. These five sacred mountains, known collectively as Wuyue 五岳, have been distributed in order of East, South, Center, West and North in accordance with the Wuxing 五行 (Five Elements) intellectual tradition. Geographically, Dongyue is Taishan 泰山 in Shandong 山東 Province; Nanyue is Hengshan 衡山 in Hunan 湖南 Province; Zhongyue is Songshan 嵩山 in Henan 河南 Province; Xiyue is Huashan 華山 in Shaanxi 陝西 Province; and Beiyue is Hengshan 恒山 or Changshan 常山 in Shanxi 山西 Province.

The *Gujin Huayi Guyu Zongyao Tu* marks these names, together with the four compass directions, in bold white characters on a black background, in contrast to hundreds of other place names rendered in black on the map's generally white background. As to the reason for giving such obvious orthographic emphasis to four compass directions and the five

peaks of Wuyue, one fundamental concept of the Chinese (Han) worldview lies in resonance between Heaven and Earth, as in *tiandi* of Heaven and *tianzi* of Earth, the round heavens and rectangular earth, etc.

The Five Peaks are the sacred mountains linking Heaven and Earth, where the ceremonies worshipping Heaven were conducted. In the Five Element Cosmology, East, South, Center, West and North correspond to the cycle of Four Seasons—East to Spring, South to Summer, West to Autumn, North to Winter and Center to the day of summer Tuyong 土用, namely the 18th day before the first day of Autumn. The ceremony in the East at Dongyue (Taishan) was conducted on the first day of Spring, in the South at Nanyue (Hengshan) on the first day of Summer, in the Center at Zhongyue (Songshan) on the day of summer Tuyong, in the West at Xiyue (Huashan) on the first day of Autumn and in the North at Beiyue (Hengshan or Changshan) on the first day of Winter. The ceremony involved both praying to Heaven and sanctifying Earth.

Of the Five Peaks, Dongyue (Taishan, elev. 1545m) was considered the most sacred by virtue of situating in the holy direction of east and of leading to Heaven. The First Emperor of the Qin 秦 Dynasty reported to Heaven that he had received its order to found his dynasty and conducted the *fengshan* 封禪 ceremony at Dongyue (Taishan). From that time on, through the Former and Later Han 漢, Tang 唐 and Northern Song 北宋 Dynasties, *fengshan* was performed at the summit and the foot of Taishan.¹⁴⁾ The idea of Dongyue (Taishan) as the holiest of the Five Peaks is based on Daoist beliefs in *shenxian* 神仙 (divine immortals) in Chinese folk religion. For Daoists, since Sanshenshan 三神山 (the mountain abode of the divine immortals) is located in Donghai 東海 (Eastern Sea), the east is the most important compass direction.

In addition to locating mountains, the *Gujin Huayi Guyu Zongyao Tu* also depicts China's numerous rivers, beginning with the Yangtze. The text of *Lidai Dili Zhizhang Tu*, under the title "Talking on the river source," tells us that "the rivers originate in Kunlun 崑崙 mountains."¹⁵⁾ Within Daoist ideas about *shenxian* there lies sacred regions where these beings reside far off to the east and west. The western realm is Kunlun Mountains, where Queen Mother Xi Wangmu 西王母 lives. The eastern realm is the aforementioned Sanshenshan, where Emperor Father Dong Wangfu 東王父 lives. In the Chinese worldview, the rivers of *hua* flow east from there sources on Kunlun Mountains and empty into Donghai where lies the Sanshenshan. However, a river itself, even if it did connect these two holy realms, was not regarded as sacred in and of itself in Chinese thought. The

sanctification of the world of *hua* was always realized by the mountains represented by the Five Peaks. This point sharply contrasts with ideas in South and Southeast Asia about the sanctity of rivers per se.¹⁶⁾

II-3. The World of *Yi*: The Discrimination of “Barbarians” Based on Tribute to *Tianzi*

The supernatural energy released in all four directions by *tianzi* standing at the center of the Earth is gradually depleted as it spreads outward, reaching zero at the point where the world of *hua* ends and the world of *yi* begins. However, this utopian view of a definite boundary between the two worlds is very difficult to apply in practice.

One clue as to how the distinction was actually made may be found by discussing the explanation of Xidong Zhuman 溪洞諸蠻 located on the south central part of the *Gujin Huayi Guyu Zongyao Tu*. The text of *Lidai Dili Zhizhang Tu* explains, “since the Jianlong 建隆 Era of the present dynasty, the Xidong Zhuman petitioned for inclusion and were all designated *cishi* 刺史,”¹⁷⁾ meaning that since the founding of the Northern Song Dynasty during the Jianlong Era (960–62), because Xidong Zhuman had grown attached to the virtue of the emperors and served them, they were appointed to lower administrative posts in the provinces; that is, transmuted from barbarism (*yi*) to civilization (*hua*).

Such an explanation defies any fixed geographical boundary demarcating realms of *hua* and *yi*, and reveals an attribute of fluctuation between the two statuses depending upon power relationships between *hua* and *yi*. That is to say, groups and individuals who served the emperors were classified as *hua*, and those who resisted them were classified as *yi*. The ritual indicating acquiescence of *yi* into service to the emperors was the presentation of tribute (*chaogong* 朝貢). Tribute was a political act mutually recognizing the deep attachment felt by *yi* towards the virtue of the emperor (*mude* 慕德) and the largess of the emperor’s virtue (*tiande* 天德), and was thus an important criterion for distinguishing between *hua* and *yi*.

Let us employ this key concept of tribute in examining the *Gujin Huayi Guyu Zongyao Tu*’s depiction of Dongyi 東夷 (the eastern barbarians) in Donghai. In addition to the map’s label “Donghai” designating the eastern sea region, there are seven oval shaped tags containing the place names Fuyu 扶餘, Riben 日本, Changguo 昌國 and Liuqiu 琉求 and group names Wonu 倭奴, Maoren 毛人 and Xiayi 蝦蟇. Fuyu was not a polity in the maritime region of Donghai, but rather located in the northern part of

the Korean Peninsula, northeast of China proper. Changguo corresponds to the region including the Zhoushan 舟山 Islands in the sea off the coast of eastern Zhejiang 浙江 Province. Liuqiu is obviously the Ryukyu 琉球 Islands (present day Okinawa Prefecture, Japan). It is interesting to know that four out of the above seven place and group names, excluding Fuyu, Changguo and Liuqiu, were included based on information from Japan.

To begin with the group name Wonu, which is synonymous with Woren 倭人, is found in the account on the reign of Emperor Guangwu 光武帝 of the *Hou Hanshu*'s 後漢書 “Dongyi zhuan” 東夷傳 section on eastern barbarians, which mentions that during the second year of the Jianwu 建武中元 Era (56 CE), the Wonu celebrated the dynasty by offering tribute.¹⁸⁾ Due to the fact that the term *wo* 倭 literally means “hunchbacked dwarf,” in 703 when Awata-no-Mahito 粟田真人 was presented before Empress Wu Zetian 則天武后, this Japanese envoy introduced himself as “ambassador of Ribenguo 日本國.”¹⁹⁾ Furthermore, on the epitaph of I-no-Manari 井真成, who died in Chang'an 長安 in 734, we find engraved the phrase “Country's Name Riben” 國號日本, indicating that the Tang 唐 Dynasty at that time had changed the designation of Japan as Woguo and recognized it as Riben. Although the section of the *Jiu Tangshu* 舊唐書 containing information about Japan is entitled “Woguo-Riben zhuan,” it specifically states that “Woguo is the kingdom of the Wonu... Ribenguo is a different polity from Woguo,” and as to its borders, “Its eastern and northern borders are formed by large mountains that know no limits, and outside those mountains stands the kingdom of the Maoren 毛人.”²⁰⁾ Finally, concerning the Xiayi 蝦蟇 (the Emishi people), the “Riben zhuan” of the *Xin Tangshu* states, “The Xiayi accompanied the Japanese delegation to court. The Xiayi are sea islanders.”²¹⁾

Such is the process in which the *Gujin Huayi Guyu Zongyao Tu* incorporated important information from Japan in charting the barbarian world of Donghai. Japan seems to have been functioning as the only tributary in maritime Donghai, as indicated by the passage that “Of the eastern barbarians of the sea kingdoms... Ribenguo [Japan] comes to pay tribute,”²²⁾ in the text of *Lidai Dili Zhizhang Tu*.

Next, let us examine, the *Gujin Huayi Guyu Zongyao Tu*'s depiction of the sea to the south. To the right of where the map has been fragmented, we find the term Nanfan 南番, indicating the world of *yi* in the south. To the right of that there is Zhancheng 占城, indicating central Vietnam's Champa, Zhunian 注輦 or southern India's Cōla, Sanfoqi 三佛齊, corresponding to Sriwijaya along the coasts of the Malacca Straits, and She-

po 闍婆, or Java, while to the left there are Meipu 眉蒲, Funan 扶南, or southern Cambodia, and Danpu 丹蒲. Of these seven locations, Meipu and Danpu remain unidentified, while the remainder are all polities in the maritime world stretching from the South China Sea to the Bay of Bengal. The existence of these locations came to be known through the accumulation of geographical knowledge attained through Song China's proactive overseas trade relations with those two regions. On the other hand, the description of Zhunian on the map is quite different from the actual geographical position. It is located at the southeastern corner of the map together with Zhancheng and Sanfoqi. Then, *Lidai Dili Zhizhang Tu* regards Zhunian as a country located in the present-day Southeast Asia, not in south India.

Contrasting this cartography with what the text of the *Lidai Dili Zhizhang Tu* has to say about the “kingdoms of the south sea,”²³⁾ a number of interesting observations come to light. First, in *Lidai Dili Zhizhang Tu*, we find more than seven polities dotting the southern sea like Heling 訶陵 and Huangzhi 黃支, both of which are not charted in *Gujin Huayi Guyu Zongyao Tu*. Huangzhi does correspond to Kanchi, India, mentioned above in the interpretation of Ptolemy's map. The *Gujin Huayi Guyu Zongyao Tu* did not plot all the barbarian polities of the region, but only a selection of them. The standard for this selection was again based on whether or not they submitted tribute to the Chinese court, as *Lidai Dili Zhizhang Tu* explained in the text.

Turning north in the vicinity of the Great Wall east of Liaoshui 遼水 (Liao River) we find the names of many barbarian polities and people. Of them kingdoms like Bohai 渤海, Qidan 契丹 and Baiji 百濟 had already disappeared from the political scene. *Lidai Dili Zhizhang Tu* explains the Jurchen 女真 kingdom of Jin 金 as well as Wen'an 文安 and Gaoli 高麗 being similar to the “barbarians” of the south central mainland in “petitioning the court for inclusion as the liege subjects... since the Jianlong Era of the present dynasty.” Here as well, only those polities rendering tribute to the Song Dynasty have been plotted.

III. al-Idrīsī's *Tabula Rogeriana* and the *Gujin Huayi Guyu Zongyao Tu*: East-West Exchange of Cartographical Information

From the mid-12th into the 14th century, when the *Gujin Huayi Guyu Zongyao Tu* was still in print, maps of the medieval world were being drawn

throughout Eurasia, including al-Idrīsī's *Tabula Rogeriana* (1154) in the Islamic world, the *Hereford Map*, Christian world map drawn in western England (c. 1300) and the Japanese Buddhist world map of *Gotenjikuzu* 五天竺圖 (Map of Five Indies; transcribed in 1364). Comparing the scope of these four maps, the *Gujin Huayi Guyu Zongyao Tu* and *Gotenjikuzu* cover an area from East Asia to western South Asia, while *Hereford* covers an area from Europe to the northwestern portion of South Asia. In contrast, *Tabula Rogeriana* covers the whole regions of North Africa and Eurasia; that is, from the western extremes of Europe and Africa through to the eastern edge of China. In other words, *Tabula Rogeriana* includes the areas covered by all of the other three maps, which reflects al-Idrīsī's broad world-wide scope.

III-1. 12th Century Sicilia, the Home of *Tabula Rogeriana*

Tabula Rogeriana is a map which represents the entire medieval Islamic world. However, it was drawn on the island of Sicilia in the central Mediterranean Sea, not in the Western Asian center of Islamic civilization. Sicilia, which, together with the southern tip of peninsular Italy, was in medieval times an important strategic location which divided the Mediterranean maritime world into eastern and western regions and connected them. This importance is comparable to the aforementioned role played by the southern tip of the Indian Sub-Continent in the maritime world of the Indian Ocean. For this reason, Sicilia has throughout its history been the object of conquest by various forces. Limiting ourselves to the Middle Ages on, it was wrested away from the Byzantine Empire by the Islamic Aghlabid Dynasty, then during the latter half of the 11th century was conquered by the Norman Kingdom of Sicily. Sicilian society at that time, was a melting pot sharing the religious and cultural traditions of Roman Catholicism (Norman), Islam (Arab) and Greek Orthodoxy (Byzantine). Linguistically, it was home to Latin, Arabic and Greek.²⁴⁾

Tabula Rogeriana itself was ordered drawn by the first king of Norman Sicily Ruggero II (r. 1095–1154), who in 1138 summoned al-Idrīsī together with a group of scholars and adventurers regardless of religion or ethnic origin in promoting the creation of a world map based on a comprehensive analysis of information to be collected over the next fifteen years. In the opinion of this writer, within the data collection process, the latest information concerning China was also obtained in the form of *Lidai Dili Zhizhang Tu* reaching Sicilian soil, as will be shown in the following pages.

Tabula Rogeriana was completed in 1154, etched into a plate of pure silver of 134kg in weight measuring 350cm in length and 150cm in width.²⁵⁾ Judging from the amount of time it took to prepare the map, its size and the international character of Norman Sicily, there is no doubt that it was the most detailed piece of world maps ever created. However, 1154 also marked the death of Ruggero II, after which the silver impression of the map was soon destroyed.

Fortunately, Ruggero had prior to its completion ordered al-Idrīsī to draw up documents explaining the content of the map. What resulted was the work *Nuzhat al-mushtāq fī ikhtirāq al-āfāq* (The Pleasure Book for One Who Is Eager to Understand the Regions of the World), which was completed at the same time as the map. This combination of illustration with accompanying text is one of the map-making characteristics peculiar to the Islamic civilization.²⁶⁾ Despite the fact that *Tabula Rogeriana*, the chart, had been lost, an Arabic copy of it has enabled us to know its content today. Figure 4 is the map hand-copied in Cairo in 1456.



Fig. 4 al-Idrīsī's World Map, from the Manuscript *Nuzhat al-mushtāq fī ikhtirāq al-āfāq* Stored at the Bodleian Library, University of Oxford (MS. Pococke 375, fols. 3b–4a)

III-2. The Exoteric and Esoteric Dual Structure of Directional Reference

One glimpse of *Tabula Rogeriana* reveals its circular composition consisting of disk-shaped land masses and surrounding bodies of water, giving the observer the impression that the map was drawn based on the theory that the Earth is a flat circle, similar to the map of medieval Europe known as “T-O Map.” Although, the global-shape theory of the world which existed since Aristotle was widely held throughout the medieval Islamic world, the composition of disk-shaped land masses surrounded by bodies of water was an expression of the world adopted by Islamic cartographers in the 9th century, and it was this latter tradition that was followed by al-Idrīsī in his *Tabula Rogeriana*.

Concerning the shape of the Earth, the 14th century historian Ibn Khaldūn stated, in his *Muqaddimah* (An Introduction to History), “The surface is covered with water... since it seems to actually be a grape floating on its surface, one part of the Earth’s surface protrudes above the water... as the place for human inhabitation by the grace of God... It is round... The protruding part takes up one-half the Earth’s surface of which one-fourth is the habitable area for the human beings.”²⁷⁾ The expression of the spatial distribution of water and land being like “grapes floating on water” seems to be a unique explanation by the West Asian and Mediterranean peoples who are so much familiar with grapes in their daily life. Rough estimate of the percentages of land and water in *Tabula Rogeriana*, including the surrounding bodies of water, comes to about even, as Ibn Khaldūn stated.

The perception that the disk-like land mass has a definite nucleus, which is regarded as the holiest point, or most symbolic, is a common characteristic regardless of time and place. *Tabula Rogeriana*, as well, plots its nucleus as the Islamic holy places, although neither Makka nor Madīna appear as place names, while Ḥijāz marks the area of the two holy cities on the Arabian Peninsula.

Tabula Rogeriana depicts the world with the south at the top. Although the earliest Islamic cartographers followed the ancient Greek tradition of positioning the north at the top,²⁸⁾ the reverse was soon adopted, to the extent that every medieval Islamic world map conformed to the “south at the top” format. Originally in Islam, there was no preference as to which of the four cardinal direction was the best or most respected. Instead, the sacred direction for Muslims is *qibla* (lit. where to face); that is, toward Ka’ba in Makka, whose direction is relative rather than absolute.

Mosques all over the world are built according to *qibla*, like spokes of wheel seeking their hub.

Reviewing *Tabula Rogeriana* with this same worldview in mind reveals, at least to this observer, a dual structure of clear exoteric directions and hidden esoteric directions, the former represented by the “south at the top format,” and the latter implying *qibla*. The latter, being a centripetal direction converging on Makka, the nucleus of the map’s land mass, therefore renders for us the composition of the entire Islamic world seeking and converging on Makka, while at the same time tells us the *qibla* of each region and point of the Earth.

So why place the exoteric reference direction in the south rather than the north, as indicated by any compass? The central belt of the medieval Islamic civilization was the huge east-west swath of Earth encompassing the Mediterranean from the west to Iran in the east. The central concern of map-making in the Islamic world, including the work of al-Idrīsī, was this huge regional belt, which lay to the north of Makka. To face Makka from that region required “facing up south” in terms of *qibla*; thus the south is found at the top of all maps of the medieval Islamic world.

III-3. The Denial of Ptolemy’s Map and Acceptance of the *Gujin Huayi Guyu Zongyao Tu*

Tabula Rogeriana is a disk-shaped map in contrast to Ptolemy’s fan-shaped chart, thus giving the observer very different impressions of world geography. Both maps differ in terms of direction as well: the former plotting the south at the top, the latter the north, thus separating their respective worlds even further. However, they do have at least two important hidden similarities, which are far more subtle than shape and reference direction. They are examples of map-making based 1) on the global shape of the Earth and 2) on the Equator as the standard latitude and the meridian drawn through the western edge of the Canary Islands as the standard longitude. That being said, familiarizing oneself with these similarities by no means eliminates the different impressions they lend to the naked eye.

The conventional wisdom among researchers is that *Tabula Rogeriana* is a successor to Ptolemy’s map. However, such a view is appropriate only in terms of the basic frame for constructing world maps, for they differ greatly in all other respects. In particular, concerning the depiction of the interior of the inhabitable zone which is main object of his map making, the only thing that al-Idrīsī may have assimilated from Ptolemy was the

route of the Nile River. Even on this point, we can observe rather “refusal” of Ptolemy’s map.

This attitude is clearer in the mapping of maritime zones. The first and obvious difference here is *Tabula Rogeriana*’s depiction of its land mass delineated by water on all sides, while the second is the opening up of Ptolemy’s landlocked Indian Ocean to the eastern part of the outer ring sea. Let us focus on this latter point in the hope of expanding the subject matter to the realm of the east-west exchange of cartographic information.

On the occasion of the founding during the mid-8th century of the Abbasid Caliphate based in Baghdad, trade in the Indian Ocean flourished. It was at that time that the “way to China” changed from the Gulf of Thailand route over the Kra Isthmus to the direct maritime route through the Malacca Straits. Together with this commercial development, Muslim merchants became active in Canton (Guangdong). It was only a matter of time before Ptolemy’s landlocked Indian Ocean hypothesis would be overturned by direct observation. It has been argued that this perception

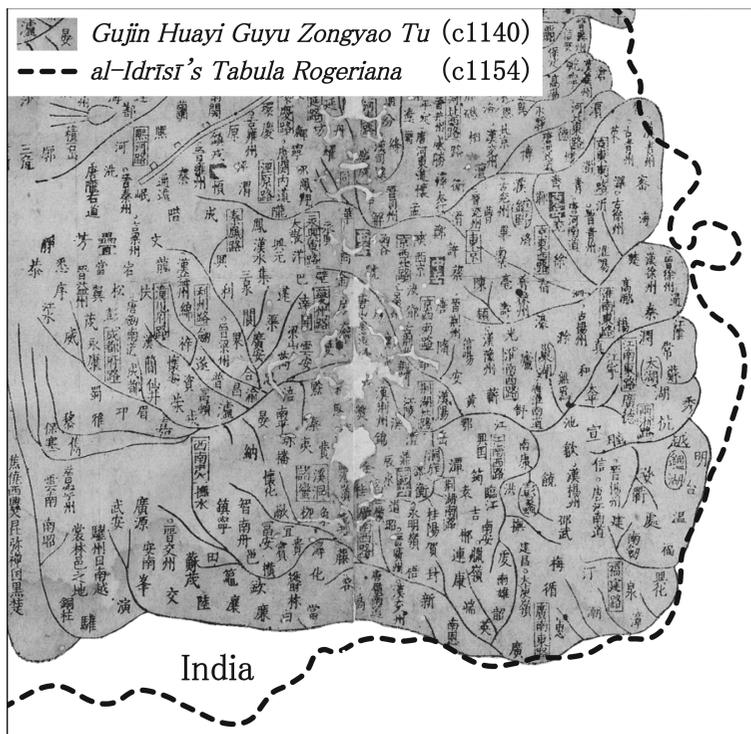


Fig. 5 Mapping of Southeastern Corner of Asia: Comparison of *Gujin Huayi Guyu Zongyao Tu* and al-Idrisī’s Map

was shared by the Islamic world from the time of its inception.

Now let us look at the depiction of the Indian Ocean of the *Tabula Rogeriana* in more detail. It depicts a land mass projecting in an easterly direction from Africa south of the Indian Ocean with four highlands, rivers and place names in addition to another place name near its easternmost tip. In some of the extant copies, this last place name has been elided, but the third place name to the west can be read as “Sofala.” Sofala, which is located in present day central Mozambique, was at the time in question a port city on the southwestern edge of the Indian Ocean’s Arab maritime trading network, in addition to being a collection and distribution point for gold from the hinterland. It was therefore appropriate for al-Idrīsī to include Sofala in his extension of the east coast of the African continent.

Ibn Khaldūn, who calls the Indian Ocean the “Chinese Sea” or the “Abyssinian Sea,” states “Its largest islands include Celandib [Ceylon]... Kulum (Sunda Archipelago)... In the Indian Ocean there is a chain of islands surrounding southern China called the Wāqwāqs, east of which lies Sīlā (Silla, Korea).”²⁹⁾ Accordingly, *Tabula Rogeriana* depicts many island dotting the Indian Ocean. Of these, Celandib is a square-shaped island located almost in the center of the Ocean, as is Taprobanae Insulae on the Ptolemy’s map. On the other hand, there is no huge archipelago off southern India.

What is problematic here is the liberation of a landlocked Indian Ocean; in other words, the opening of the Indian Ocean on its eastern rim into another large ocean. Notice should also be taken of the shape of the coastline along the southeastern edge of the Asian Continent, due to the fact that this depiction closely resembles that of the Chinese *Gujin Huayi Guyu Zongyao Tu*, drawn at about the same time. This observation clashes with the conventional argument that, paraphrasing Harvey,³⁰⁾ the Chinese stone-inscribed *Huayi Tu* 華夷圖 had no influence whatsoever on the creation of the medieval world maps of a different civilization, which of course would include *Tabula Rogeriana*. Assuming that is the case, following the kind of reasoning offered by Harvey would completely invalidate any attempt to compare the *Gujin Huayi Guyu Zongyao Tu* and *Tabula Rogeriana* regarding their respective depictions of the southeastern China coastline.

In order to controvert such a conclusion, let us examine the relationship between Harvey’s Chinese source and our *Gujin Huayi Guyu Zongyao Tu*. The stone-inscribed *Huayi Tu*, which was carved during the Southern Song Period in 1136, was a smaller version of the *Hainei Huayi Tu* 海內華

夷圖 (Map of China and Barbarian Countries on the Land Surface) made by Jia Tan 賈耽 during the Tang Period in 801. Furthermore, the stone-inscribed *Huayi Tu* was referred to in the making of the *Gujin Huayi Guyu Zongyao Tu*. These three maps, all with “*huayi*” in their titles, are not only all depictions of the world according to the Chinese civilized-barbarian division of it, but also form a sequential tradition of cartography. Therefore, comparing *Tabula Rogeriana* with the *Gujin Huayi Guyu Zongyao Tu*, the culmination of that tradition, is the same as comparing it with Harvey’s stone-inscribed *Huayi Tu*.

Figure 5 is a superimposition of the southeast coast of Asia depicted in the two maps when adjusted to scale, producing a fairly good match. In particular, their coastlines running north from the northeastern edge of the Indian Ocean following the sea rim are remarkably similar, which provides plenty of room for offering the hypothesis that al-Idrisī drew his coastline based on the Chinese map-making tradition represented by the *Gujin Huayi Guyu Zongyao Tu*. Therefore, al-Idrisī’s liberation of the landlocked Indian Ocean was not based solely on information received from Muslim traders from the West, but also an innovation incorporating knowledge provided by Chinese cartography.

In this writer’s opinion, the most likely provider of that Chinese knowledge was the *Gujin Huayi Guyu Zongyao Tu*, for the following five reasons.

- (1) The high degree of correspondence between the two maps of the coast lines in the southeastern corner of Asian continent as shown in Figure 5.
- (2) Assuming that the atlas *Lidai Dili Zhizhang Tu* containing the *Gujin Huayi Guyu Zongyao Tu* was published in 1140, that year falls well within the period 1138–1154, during which resources were being collected to draw *Tabula Rogeriana*.
- (3) While the stone-inscribed *Huayi Tu* also fulfills (1), transporting it all the way to Sicily is difficult to imagine, compared to the portability of the printed *Lidai Dili Zhizhang Tu*.
- (4) Of course a rubbing of the stone tablet would have been done quite well, and its southeastern Asian coastline also matches well when superimposed on *Tabula Rogeriana*. However, when compared to the

Gujin Huayi Guyu Zongyao Tu, one notices an irregularity regarding the northeastern Indian Ocean coastline, making the *Gujin Huayi Guyu Zongyao Tu* our most likely candidate.

- (5) The western base of operations for the Indian Ocean trade was Basra, the port of the Abbasid capital of Baghdad. Its seventh caliph Ma'mūn constructed a library called Bayt al-Ḥikma (House of Wisdom) filled with foreign language sources, mainly of Greek origin but also including a number of Chinese sources. Although the library was already in decline at the turn of the 12th century, the Abbasids continued to be actively involved in trade with Song China. As mentioned previously, the *Gujin Huayi Guyu Zongyao Tu* was the first world map printed in China. There would be nothing surprising about *Lidai Dili Zhizhang Tu*, which contains the map, circulating abroad as the latest atlas and source of geographic information on China. Whether or not it found its way to al-Idrīsī's map room in Sicily is not known; however, it may have been encountered in the 15-year search for sources, which surely included a tour of Baghdad's Bayt al-Ḥikma.

Even if we eliminate (5) as pure conjecture, (1)–(4) do build a fairly strong argument that the *Gujin Huayi Guyu Zongyao Tu* was an important reference source for al-Idrīsī's depiction of the coastline of his liberated Indian Ocean. This fact not only indicates a flourishing exchange of information and knowledge between Song China and the Islamic world of the 12th century, but also controverts the conventional argument that the *Huayi Tu* cartographical tradition was limited solely to the Chinese world.

Acknowledgement

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