

# Global influence of the map of Japan produced by Japanese cartographer Sekisui Nagakubo.

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## Abstract:

Both epoch-making high accuracy map of Japan named 日本分野図, Nihon bunya zu “Allocation Map of Japan” (Dr. Kazutaka Unno called it as “Astronomical Map of Japan”) compiled by Japanese Cartographer 森幸安 Kouan Mori in 1754, and following, 改正日本輿地路程全図” Kaisei Nihon Yochi Rotei Zenzu “Revised General Route Map of Japan” by 長久保赤水 Sekisui Nagakubo in 1779 were created according to the latitude data observed in 14 provinces in Japan recorded in 天文瓊統 Tenmon Keitou (book of Astronomy and divination in Japan) written by Japanese astronomer 渋川春海 Harumi Shibukawa. And in 天文瓊統 Tenmon Keitou (book of Astronomy and divination in Japan) the latitude of 北京 Beijing, 南京 Nanjing and 高麗 Korea recorded in 四海驗測 Si hǎi yān tsē Nationwide survey conducted by 郭守敬 Guo Shoujin et al in 1279 in 元 Yuan Dynasty were displayed for revision of calendar to new 授時曆 Shoushi-li calendar. 渋川春海 Harumi Shibukawa adopted 授時曆 Shoushi-li calendar formulated by 郭守敬 Guo Shoujin et al to his 貞享改曆 Joukyou revision of calendar in Japan 1685. This proves that the technology of observation of the latitude in Japan was transmitted from China for revision of calendar and observed latitude data recorded in Tenmon Keitou were exploited to the cartography of Map of Japan without land survey project.

In 1754 森幸安 Kouan Mori compiled his 日本分野図, Nihon bunya zu “Allocation Map of Japan” by Chinese technology of 方格図 fānggētú grid map east and west equidistant from the distance of latitude 1° by Chinese Cartographer 羅洪先 Luo Hong xian’s 廣輿圖 Guan YuTu, “Vast map of China” in Ming. Kouan Mori improved his map of Japan to realise the particularity in each allocation grid. Kouan Mori learned global atlas from duplicate the Matteo Ricchi’s 坤輿万国全圖 Kunyu Wanguo Quatu: general map of Myriad countries on the earth 1602.

In 1779, 長久保赤水 Sekisui Nagakubo made many modifications to the Kouan Mori’s maps and improve it to carry in pocket, named 改正日本輿地路程全図” Kaisei Nihon Yochi Rotei Zenzu “Revised General Route Map of Japan” and published it. Since 1809, this Nagakubo’s map has been repeatedly duplicated and translated into the language of each country in Europe and published, in Russia in 1809 and 1810, in France in 1827 by name of famous Surveyor Krusenstern. In 1855-1862 by United Kingdom Admiralty published the map “Japan Nipon (mean Honshuu Island) Kiusiu and Sikok and a part of coast of Korea” based on a replica map by Krusenstern in 1827. However, these were published without knowing the name of the Japanese original author Sekisui Nagakubo.

**Keywords:** 天文瓊統, Tenmon Keitou 渋川春海 Harumi Shibukawa, 森幸安 Kouan Mori, 日本分野図 Nihon bunya zu “Allocation Map of Japan” with grid of latitude line, 長久保赤水 Sekisui Nagakubo, 改正日本輿地路程全図” Kaisei Nihon Yochi Rotei Zenzu “Revised General Route Map of Japan” 郭守敬 Guo Shoujin, 四海驗測 Si hǎi yān tsē Nationwide survey, 羅洪先 Luo Hong xian, (1504-1564). 廣輿圖 Guan YuTu, 方格圖 fānggētú grid map equidistant from latitude 1°.

## Discussion

### 1. Historical technology of calendar and cartography in China.

In China, observation of latitude was exceeded in nationwide survey 四海驗測 Si hǎi yān tsē in 1279 for the revision of calendar 宣明曆 Hsuan min-li from 822 to 授時曆 Shoushi-li calendar and objective grasp of nationwide territory simultaneously, conducted by 郭守敬 Guo Shoujin (1231-1316) and his colleagues in Yuan dynasty.

Chinese technology to confirm latitude from astronomical observation is developed to Chinese cartography of 方格圖 fānggētú grid separate east and west equidistant from latitude 1° was succeeded from 輿地圖 Yu Chidu by 朱思本 Zhu Si-ben 1321 to 羅洪先 Luo Hong xian’s (1504-1564) 廣輿圖 Guan YuTu (Wide map of Ming).

### 2. The observed data of latitude in Japan by Harumi Shibukawa revision of calendar in Joukyou era.

In 1685 Japanese astronomer 渋川春海 Harumi Shibukawa studied 授時曆 Shoushi-li transmitted from China for revision of calendar from old 宣明曆 Hsuan-min-li calendar 862 in Japan to 授時曆 Shoushi-li calendar. The technology to grasp the nationwide area including surrounding area Matsumae southwest of Hokkaido by observation of latitude for revision of calendar and operated the observation of the latitude in 14 provinces from northern part of Tsugaru in Honshuu Island to Kagoshima city in Kyushuu Island covering mainland of Japan in 1659, and add the latitude data of Ryu-Kyu (Okinawa Island). Harumi Shibukawa recorded those data in his 天文瓊統, Tenmon Keitou (book of Astronomy and divination in Japan)

Harumi Shibukawa compiled 大和曆 Yamato calendar and Shogunate Government enforce the revision of

calendar in 2<sup>nd</sup> year of Joukyou 1685 in Japan called it as 貞享改曆 revision of calendar in Johkyo era..

**Keywords:** 郭守敬 Guo Shoujin(1231-1316), 改曆 revision of calendar, 授時曆 Shoushi-li calendar, 四海驗測 Si hai yan tse nationwide survey in 1279, 輿地圖 Yu Chidu by 朱思本 Zhu Si-ben 1321, 貞享改曆 the revision of calendar in Joukyou era.

### 3. Application of observed latitude data in cartography to produce accurate general map of Japan, by citizen without national survey project.

In 1779 長久保赤水 Sekisui Nagakubo made many modifications to the Kouan Mori's 日本分野図, Nihon bunya zu "Allocation Map of Japan" map add description and picture of high way, river, sea way, sea stream and sea tide, stood on domestic user's viewpoint and improve it to carry in pocket useful map, named 改正日本輿地路程全図 "Kaisei Nihon Yochi Rotei Zenzu "Revised General Route Map of Japan" and published it.

We can recognise Sekisui Nagakubo's study of Chinese cartography and Matteo Ricci's Atlas, from Fig6, Fig5.

In Japan there are many mountains and islands and complex terrain, citizen and domestic navigator needed accurate and detailed maps of Japan. In those years, published map of Japan was a simple and inaccurate picture map, such map as Ryuusenzu compiled by Tomonobu Ishikawa. Fig.9

General map of Japan (pictorial map) was compiled from submitted region map across the country more than 5 times from 1591 to 1871 by Shogunate Government. And General coastal Map of great Japan (so called Inoh map 伊能図) was compiled in 1821 by national project.

But all of these general maps of Japan were classified as national secrets.

Both Kouan Mori or Sekisui Nagakubo tried to use the observation data of latitude recorded in the astronomy book "Tenmon Keitou 天文瓊統" written by astronomer Harumi Shibukawa in 1698 when the calendar was revised. Fig.1

Each of them estimated the position of the line every 1 degree of latitude from the latitude observation data by astronomer Harumi Shibukawa and expressed it on a map, and drew the grid line of longitude estimated with equidistant to 1 degree of latitude. They divided line of longitude to the west and east at the former capital Kyoto. (example: Imperial Palace 御所 Goshō in Kyoto, DMS Lat 35° 01' 27" N, Long 135° 45' 44" E. Comparing the distance of longitude 1° with the distance of latitude 1° in Kyoto, is approximately 17.7% less than 1° latitude distance (91,274m : 110,949m).

(But Kouan Mori imagine the length of 1° latitude as 40 里 ri = 3927m × 40 = 157080m)

成都 Chengdu is at 30° 04' N .

Comparing the distance of latitude 1° with the distance of longitude 1° in 成都 Chengdu, the distance of

longitude 1° is approximately 13.0% less than the distance of latitude 1° .

London is at 51° 31' N latitude.

Comparing the 1° latitude distance with the 1° longitude distance in London, 1° longitude distance is approximately 37.6% less than 1° latitude distance.

In the case of Japan or China, it is not a big difference like in London or in northern Europe.

The latitude described in Harumi Shibukawa's 天文瓊統 Tenmon Keitou Astronomy book is based on 365 degree, and it same to nationwide survey 四海驗測 in 元 yuan.

These values are based on 365° , 1.4% more than modern values based on 360° , and there are also differences due to non-numerical expressions.

### 4. Realize national prosperity in national isolation ,

Sekisui Nagakubo folded the small map which became accurate and detailed, and made it portable.

This Sekisui Nagakubo's map has made a strong contribution to Japan's domestic prosperity in not only in national economy but in people's culture, even though national isolation at that time, and has become long-term sales for over a century in Japan.

### 5. Realize international reliability as sea map

Numerical latitude and the lines in this map, and lines temporary representing the longitude are also very useful for foreign navigator. It translated into the language of each country in Russia and Europe, repeatedly duplicated and published. In Europe, the name of the Japanese original author was not written on those maps, but was published under the name of famous explorer Krusenstern, or published under the name of the cartographic office of the admiralty (United Kingdom).

### Conclusions

This high-precision map "Revised General Route Map of Japan" created by Sekisui Nagakubo was used around the world because he took in, fused, and accurately made Chinese technology, European technology of cartography and Japanese geographical knowledge, and returned it to not only domestic but also for the World.

This Nagakubo's "Revised General Route Map of Japan" triggered the creation of the Inoh's complete survey map of the mainland of Japan. With the map by Inoh, Japan was able to defend national land, and diplomatic scramble with United Kingdom not colonized by imperial Russia or so, and realized the industrial revolution.

Unknown Japanese original author of "Revised General Route Map of Japan" cartographer Sekisui Nagakubo 長久保赤水 and tentative map's cartographer 森幸安 Kouan Mori's name should be specified in the cartographer's history of the world from now on with name of cartographer 伊能忠敬 Tadataka Inoh and Rinzou Mamiya 間宮林蔵 who found Channel of

Mamiya, and 郭守敬 Guo Shoujin in 元 Yuan, 羅洪先 Luo Hong xian or 利瑪竇 Matteo Ricci in 明 Ming in China, or Korean Cartographer 金正浩 Jon ho Kim. In the case of Far East Orient Asia we can see original unknown development of Cartography.

### 1.Chronology in China

Key word in Chronology

1. calendar and cartography 2. latitude 3. the concept of globe. 4. other chart

- 1279 元 Yuan 郭守敬 Guo Shoujin 四海驗測 Si hǎi yān tsē observation of latitude for objective grasp of nationwide territory, and revision of calendar to 授時曆 Shoushi-li calendar a
- 1321 元 Yuan 朱思本 Zhu Si-Ben 格子地圖 grid map of China based on the distance of Latitude b
- 1555 明 Ming 羅洪先 Luo Hong Xian(1504-1564) 廣輿圖 Expanded General Map (of Ming) b
- 1595 Abraham Ortelius(Brabantian) published “Japoniae Insvlae Descriptio” Map of Japan partly including middle East Coast of China with scale of latitude North 30° , 35° , 40° and longitude east 145° – 150° -145° by luna distance, not Greenwich (mid atlantic ocean) d
- 1602 明 Ming 利瑪竇 Matteo Ricci(1552-1610) from Italy to Macau 1582) the concept of globe 輿地山海全圖 Yudi Shanhai Quantu General Map of the Mountain and Sea(geographic), the first edition of Matteo Ricci’s World Atlas c
- 1584 坤輿萬國全圖 Kunyu Wanguo Quantu :General Map of Myriad Countries on the Earth.1602 c

### 2.Chronology in Japan

1685 Harumi Shibukawa 渋川春海 (1639-1715)

Japanese astronomer adopted Yuan’s technology to revise calendar transmitted to Japan by his study, and he operated 貞享改曆 revision of calendar in Joukyou era in Edo era from 宣明曆 Hsuan-Ming-li to 授時曆 Soushi-li, and nationwide observation of latitude in Japan to confirm the distance of geographical position 里差 between China and Japan for revision of new calendar 大和曆 Yamato calendar was operated. \* (Cf. Abraham Ortelius’s Map of Japan in 1595)

- 1685 Harumi Shibukawa 渋川春海 wrote 天文瓊統 Tenmon Keitou (book of Astronomy and divination in Japan), with observation data of 14 province in Japan.
- 1691 Tomonobu Ishikawa 日本海山潮陸圖 Nihon Kaizan chou riku zu Map of sea and mountain. sea current and land of Japan (tentative by Tsujimoto) (picture map of Japan)
- 1701-D year (unknown) Kouan Mori 森幸安
- 1751 大地圓球天合 三大界五大洲萬國圖 cf. a,b,c,d

Atlas of great circle globe consisted by 3 Worlds and 5 continents and myriad countries. Duplicated from 利瑪竇 Matteo Ricci’s 坤輿萬國全圖 Kunyu Wanguo Quantu :General Map of Myriad Countries on the Earth

- 1754 日本志輿地部 日本分野圖 Field allocation map of Japan (Allocation Map of Japan)
- 1717-1801 Sekisui Nagakubo’s 長久保赤水 cf. a,b,c,d
- 1768 Sekisui Nagakubo 改製扶桑分里圖 Reproduced allocate by li distnce ) Map of Japan.
- 1775 Sekisui Nagakubo 新刻日本輿地路程全圖 Revised print General road map of Japan.
- 1780 改正日本輿地路程全圖 Revised General Road map of Japan became a century long seller.
- 1783 大清広輿圖 Dai Shin Kouyozu General map of Great Qin duplicate and revised by Nagakubo. b
- 1785 地球萬國山海輿地全圖說 around 1788 duplicated and revised by Sekisui Nagakubo. c
- General map of earth, mountains seas and myriad countries  
<Classification of including concept>  
a. latitude and 授時曆 Shoushi-li calendar.  
b. 格子地圖 grid map  
c. Global Atlas  
d. Abraham Ortelius or portlano chart etc.

### 3.Chronology in Russia and Europe duplicated and translated without original Japanese author’s name

(1784 Issac Titsing send Sekisui Nagakubo’s “Revised General road map of Japan” to Holland)

- 1809 Irkutsk  
“General Map of showing Japanese Islands and Neighboring Countries” File in Irkutsk by Baron Frederiks N.P.Rezanov due to the second mission to Japan in Nadezhda in 1805.  
(Allexei V Postnikov wrote)  
Shigeru Kobayashi wrote Khvostov or Davidov subordinate of N.P.Rezanov gained it in Sakhalin.
- 1810 St.Petersburg “ General Map of the Japanese Sixty-Six Provinces” in 1810 by Lieutenant Colonel A.I.Khatov .(by Postnikov.)  
The representation of direction by Khatov was corrupted. (Tsujimoto)
- 1827 Krusenstern(from Paris) CARTE de l’empire du “JAPON” 1827
- 1835 Frantz Von Siebold NIPPON I Third and Fourth distribution from Holland (By Miyazaki)
- 1855 United Kingdom Admiralty  
“JAPAN NIPON KYUSIU and SKIKOK and a part of coast of Korea” According to Krusenstern’s chart of 1827. Cartographic office of the Admiralty

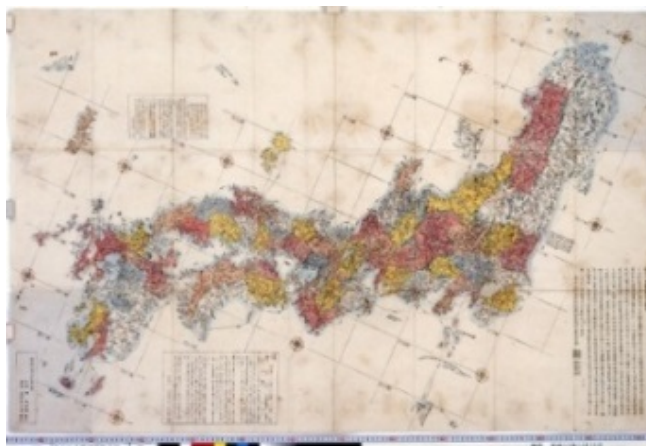


Fig1. Kaisei Nihon Yochi Rotei Zenzu 改正日本輿地路程全図 Revised Route Map of Japan by Sekisui Nagakubo in 1780 (Takahagi city)



Fig2. General Naya Karta Japonskago 1809 The General map, Showing Japanese Islands and Neighboring Countries Copied from the Japanese File by Baron Frederiks. RG VIA Russia State Military History Archive. (Alexey V Postnikov wrote) (Tsumimoto bought the copy from Vint Print Jan 2015 without description of possession) Shigeru Kobayashi wrote National Archives of Estonia (Talin) Another is The General map of the Japanese state, Divided into Sixty-Six Provinces, Compiled on the basis of a printed Japanese map in 1810 by Lieutenant Colonel A.I. Khatov. RG VIA (Alexey V Postnikov wrote)



Fig3. CARTE de l'empire du JAPON 1827 By Krusenstern published in France (Kinki University library)



Fig4. JAPAN NIPON KYUSIU and SKIKOK and a part of coast of Korea

Cartographic office of the Admiralty 1855 According to Krusenstern's chart of 1827. (United Kingdom Hydro office) (the bended landform of Tsushima Island in both Krusenstern 1827 and United Kingdom 1855 was caused by the fold).



Fig5. 地球萬國山海輿地全圖說 around 1788 Chikyuu Bankoku Sankai Yochi Zenzu Setsu) By Sekisui Nagakubo 長久保赤水 "General Map of the Myriad Countries, and Mountains and Seas on the earth" (Tentative translation by Motohiro Tsumimoto) Kyoto University Library Muroga Collection

Duplicated and revised by Sekisui Nagakubo from 利瑪竇 Matteo Ricci's 坤輿萬國全圖 Kunyu wanguo Quantu "General Map of Myriad Countries on the earth", or 輿地山海全圖 Yudi Shanhai Quantu Complete Geographic "Map of the Mountain and Sea" Chinese rendition of the first edition of Matteo Ricci's World map 1584



Fig6. 大清廣輿圖 Dai Shin Kouyozu around 1783 "General map of Great Qing" by Sekisui Nagakubo

長久保赤水 Ibaraki Prefectural Library. Speculated as edited with reference to multiple Chinese maps applied observation data of latitude and grid. 羅洪先 Luo Hong



Xian 廣輿總圖 Guangyu zongtu General Map of the expanded Territory of China.

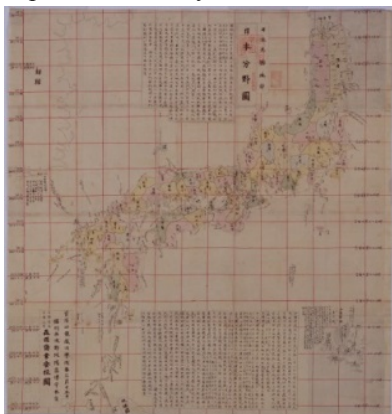


Fig.7 日本分野図 1754 森幸安 Nihon Bunyazu by Kouan Mori

“Astronomical division Map of Japan”.

(named in English by Dr.Kazumasa Unno)

“Allocation Map of Japan”

(Tentative name in English by Motohiro Tsujimoto)

(with Latitude grid for explanation including Astronomer Haruumi Shibukawa’s 天文分野之圖 Tenmon Bunya no Zu 1677 ) National Archives of Japan



Fig.8 森幸安大地圓球天合 三大界五大洲萬國圖 1748 “Dai chi enkyuu tengou sandaikai godaishuu bankoku zu” Kouan Mori Atlas of great circle globe consisted by 3 Worlds and 5 continents and myriad countries. Duplicated from 利瑪竇 Matteo Ricchi’s 坤輿萬國全圖 Kunyu Wanguo Quantu : General Map of Myriad Countries on the Earth National Archives of Japan



Fig. 9 石川流宣 Moronobu Ishikawa Map of Japan 日本海山潮陸図 1691 National Museum of Japanese History

Sekisui Nagakubo produced “Revised General Route Map of Japan” along to the latitude recorded in 天文瓊統 Tenmon Keitou (book of Astronomy and divination in Japan) recorded by Japanese astronomer 渋川春海 Harumi Shibukawa, The latitude data of 対州 Taishuu(对馬 Tsushima Island) 36°30'N was declinated too north, Sekisui Nagakubo correct it as 35°45'N, real latitude of 府中 Fuchuu prefectural government city in 对馬 Tsushima is 34 °12 'N. Probably influenced by this error of Tsushima’s latitude, the position of 東萊(釜山広域市) Dongnei in Busan city’s latitude on Sekisui map is 36 °30 'N, almost same to 大田 Daejong city, 200km north west from Pusan. 東萊 Dongnei is the ward in Busan where government office of Imperial Korea was located and pair to Embassy office of Japanese Tsushima clan 草梁倭館 Choryang Waegwan.

東萊府 Dongnei Fu and 草梁倭館 Choryang Waegwan was symbol of friendship between Korea and Japan.

This mistake of latitude of Tsushimacalled several sea survey by European countries around Tsushima. An island written 槇 Maki in front of 東萊 Dongnei is 影島 Yeon do.

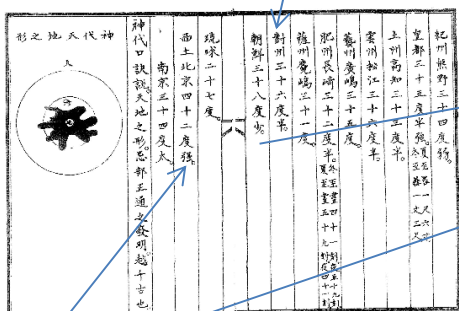
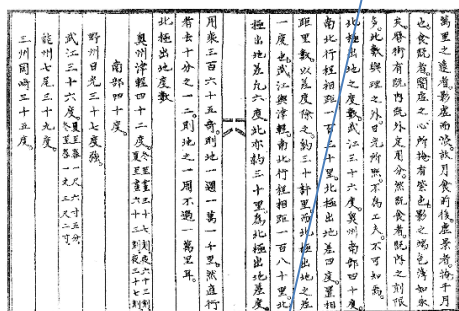


表1 (VI) 0301 元朝四海測驗結果及与現代觀測結果之对比

元朝地名	今对应地名	“北极出地” 观测值(元值)	左栏值化 为360°制	现代纬 度值	相差值	备注
南海	南海上的一个岛屿	十五度	14°42'	16°左右	1°18'左右	涉及测站的具体位置,可能不同
惠州	广东惠州	十九度太	19°28'	20°	32'	
雷州	广东海康	二十度太	20°27'	20°54'	27'	
衡岳	湖南衡山	二十五度	24°38'	27°15'	2°37'	可能观测点不同
鄂州	湖北武昌	三十一度半	31°03'	30°30'	-33'	
吉州	江西吉安市	二十六度半	26°07'	27°06'	59'	
成都	四川成都市	三十一度半强	31°08'	30°40'	-28'	
兴元	陕西汉中市	三十三度半强	33°06'	33°05'	-1'	
安西府	陕西西安市	三十四度半强	34°05'	34°14'	9'	
阳城	河南焦作市	三十四度太弱	34°10'	34°24'	14'	
扬州	江苏扬州市	三十三度	32°32'	32°25'	-7'	
南京	河南开封市	三十四度太弱	34°20'	34°48'	28'	
岳台	河南开封市西北	三十五度	34°30'	34°30'	0	此站不差
东平	山东东平	三十五度太	35°14'	35°55'	41'	
大名	河北大名南	三十六度	35°29'	36°20'	51'	
益都	山东益都	三十七度少	36°43'	36°40'	-3'	
登州	山东蓬莱	三十八度少	37°42'	37°50'	8'	
高丽	朝鲜开城	三十八度少	37°42'			
西凉府	甘肃武威	四十度强	39°30'			
太原	山西太原市	三十八度少	37°42'	37°50'	8'	
西京	山西大同市	四十度少	39°40'	40°06'	26'	
都	北京市	四十度太强	40°15'	39°55'	-20'	
上都	内蒙古多伦西北	四十三度少	42°38'	42°10'	-28'	
和林	内蒙古宁城县	四十二度强	41°29'	41°45'	16'	
和	蒙古鄂尔齐斯河上游	四十五度	44°21'			
铁勒	鄂尔齐斯河、额尔齐斯河地区	五十五度	54°13'			
北海	鄂尔齐斯河下游	六十五度	64°04'			

注:表中少、半、大分别表示 0.25°, 0.5°, 0.75° (元度); 强、弱则再加、减 1/12 度。  
从四海测验成果的日影长换算所得纬度与当时所测“北极出地”换算值及今值比较

北京 Beijing 42° 29' is the old capital of 元 Yuan Dynasty, 内蒙古自治区寧城县 Nei Menggu Ning county, and that of 北京 Beijing later in the year is 大都 Daydu.

Incidentally, the latitude of 北京 Beijing ,南京 Nanjing and 高麗 Korea were described in the Japanese astronomical book 天文瓊統 Tenmon Keitou (book of Astronomy and divination in Japan) by Harumi Shibukawa is same to the latitude observation data of 四海驗測 Si hǎi yān tsē Nationwide survey conducted by 郭守敬 Guo Shoujin in 1279.

However, 北京 Beijing in the nationwide survey in Yuan China 四海驗測 Si hǎi yān tsē was the old capital of 元 Yuan Dynasty is 内蒙古自治区寧城县 Nei Menggu Ning county, and that of 北京 Beijing later in the year was 大都 Daydu in 四海驗測 Si hǎi yān tsē nationwide survey in Yuan China. This is the evidence of traditional technology of latitude from 郭守敬 Guo Shoujin in 1279 to Harumi Shibukawa ,Kouan Mori or Sekisui Nagakubo.

Fig10.天文瓊統 Tenmon Keitou (book of Astronomy and divination in Japan)by Harumi Shibukawa 渋川春海 Vol 1.Latitude. p9-p10 Collection of modern historical material III Vol.11 The classic material of Japanese Science and Technology Published by Toshō Shuppan Kagaku Shoin in 2001 Library of National Archives of Japan.

Table1.中国測繪史 1.2 卷 The History of Chinese Surveying and Mapping 1<sup>st</sup> 2<sup>nd</sup> Volume 2002 編輯委員會 Compiling committee of P206 元朝四海測驗結果及与現代觀測結果之对比 Compare the result of 四海驗測 Si hǎi yān tsē nationwide survey in Yuan dynasty and result of today’s observation. Translated in Japanese by Dr, Ryohei Imamura and castigation by Japan Cartographers Association. 今村遼平訳 日本地図学会校訂 中国地図測量史 2014

## Appendix Necessity of review

It is impossible to complete the research of historical general map of Japan after 18 century, only by verification of vocabulary or picture as traditional study in literature, without numeric science of cartography. Open science to interdisciplinary research and, open the door to the research by citizen.

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No.8-2 Analyzing the Early 19<sup>th</sup> Century Geomagnetic declination n Japan from Tadataka Inoh Tadataka's Santou-Houi-Ki pp459-465 (in Japanese)

The summary of Supplement to Abstract and Chapter 1.

The observation data of Latitude in Japan recoded Harumi Shibukawa's Tenmon Keitou was utilize to the cartography of Kouan Mori's map or Sekisui Nagakubo's "Revised General Route Map of Japan".

The technology to observe latitude in Harumi Shibukawa's 天文瓊統(Note of astronomy of Japan) was transferred from 四海験測 Nationwide land survey in Yuan dynasty China by 郭守敬 Guo Shoujin.

Therefore Harumi Shibukawa arrange the observation data of 四海験測 nationwide land Survey by 郭守敬 Guo Shoujin in Yuan dynasty China to observation datas in Japan. Sekisui Nagakubo's "Kaisei Nihon Yochi Rotei Zenzu "Revised General Route Map of Japan" was transmitted to Russia and Europe, and repeatedly translated in Russian,French,and English and duplicated without original Japanese author's name Sekisui Nagakubo.

## Supplement

Another purpose of Kouan Mori to produce 日本分野図 Nihon-Bunya-Zu, Allocation Map of Japan was able to describe the particularity in each grid region.