The Evolution of Japanese Cartography

By Olivia McCaffrey

“European influences managed to permeate Japanese cartography, bringing greater geographical accuracy to the more decorative and traditional Japanese maps”

Political relations between Japan and Europe greatly improved the scientific accuracy of Japanese cartography, especially during the Tokugawa era, which dated from 1603 to 1867. Japanese cartography reflected the country’s distant relationship with the rest of the world. During the long stretch of geopolitical isolation from 1641 to 1853, Japanese cartographical methods developed independently from those used by the rest of the world. Over time, however, Japanese cartography absorbed subtle European characteristics, making it one of the few facets of Japanese society penetrated by European influence.

According to Marcia Yonemoto, a scholar in the early cultural history of Japan, mapping is not a “linear process of development, but [rather] a horizontal process of relationships between space, place, culture, and identity.” This description applies especially to Japan, which had a non-linear approach to the science of mapmaking and the absorption of Western influences. The progression of the map not only delineated Japanese boundaries, but it also increased their spatial consciousness. An important theme in Japanese cartography is the tension between precision and accuracy; mapmakers maintained precise detail in their maps even though the true borders and actual islands that constituted the realm of the nation remained in flux for quite some time. Tokugawa-era maps therefore evolved as a blend of European scientific knowledge and Japanese decorative traditions.

Japanese maps were diverse in their functionality; they served the purposes of exploration, administrative duties, maritime expeditions, religious chart-making, and propaganda distribution. Mapmaking has complex political connotations, and as one scholar in the field of Japanese cartography notes, “Mapping is as much about the processes of perception and representation as it is about the material product of those acts.” Emphasis on certain landmarks on political maps shows which locations were considered important in Japanese history and culture. Political maps have a prominent role in Japanese society to such an extent that their importance transcends navigational utility.

Japanese maps maintained distinct characteristics even as European scientific knowledge became ingrained in Japanese mapmaking. Certain maps remained predominantly decorative or uninfluenced by Western methods. These were
malleable and accessible to the laypeople. Although Japanese cartography was categorized by its vicissitudes, two constants remained: maps were a valued commodity and were a blend of both foreign and domestic influences. Though Japan had little direct contact with the West from the early 1600s to the mid-1800s, European influences managed to permeate Japanese cartography, bringing greater geographical accuracy to the more decorative and traditional Japanese maps.

The history of Japanese cartography is divided into two broad eras: the long-standing Buddhist conception of the world followed by the European conception in the 16th century. Buddhism was introduced to Japan in the 6th century, and it focused on cosmography, or the study of the earth using geography, astronomy, and geology. The Buddhist’s focus on cosmography prompted many endeavors to map the geography of Japan. The Tokugawa era, however, saw mapmaking truly flourish.

One scholar, Unno, asserts that the primary forte of Japanese cartography is representing Japan from different scales and perspectives. He asserts that Japan’s geographic isolation, combined with its “long history of undisturbed independence,” gave scholars little incentive to map the outside globe because “It was Japan that mattered most to the Japanese.” It was outside influences like the Europeans, however, that managed to permeate Japanese cartography, moving it closer to the modern era of accurate scientific political maps.

Unno characterizes the early Tokugawa period as one of “cartographic assimilation.” From the mid-16th to 17th century, Japanese cartography experienced heavy European influences. This was due to the influx of Spanish and Portuguese navigators and Jesuit missionaries, like Frances Xavier in 1549.

One such European influence on Japanese cartography was the use of the direction North to orient maps. Many earlier Buddhist-style maps oriented Japan in a way that South was at the top. By the Edo period, North was used to orient most general maps of Japan. Additionally, Japanese maps had no set scale, even for travel maps, and important structures were drawn larger than other locations, which degraded the maps’ accuracy. This fluidity was not present in Western maps because the resurgence of Ptolemaic geography employed a scientific, mathematical approach to mapmaking that valued accuracy above all else. Maps were no longer subject to the mapmakers’ artistic and cultural biases.

It is important to note that Japan as a whole retained a distinct non-Western and non-Christian identity during the 16th century. The arrival of Western influences immediately became a political issue so Japanese leaders sought to expel their perceived threatening ideas. The first missionary expulsion occurred in 1587. Leaders like Tokugawa Ieyasu judged Christian ideas to be incompatible with Japanese belief in Shintoism and Buddhism and so created an edict in 1614 to suppress Christianity. The shogunate, the effective ruler of the country, enacted three subsequent edicts meant to ban Christianity, diminish non-Japanese influences, and isolate Japan from the rest of the world. Only the Dutch and Chinese merchants who engaged solely in trade, a practice the shogunate considered “inextricable” to the Japanese market, were allowed to remain while the Portuguese and Spanish were driven out. It is therefore worthy of attention that cartography was a medium through which European influences were tolerably absorbed into Japanese life as beneficial agents of change.

European influences were especially prevalent in the Nanban, which were “southern barbarian” maps named after the Portuguese and Spaniards who crossed Japan’s southern border in the 1500s. Nanban then came to refer to Japanese world maps made between the late 1500s and mid-1600s that were influenced by the Europeans. These 16th and 17th century maps were generally less decorative and more scientific than their predecessors, displaying graduations of latitude, bar scales, blue bodies of water, red and green islands, and an absence of color elsewhere.

Jesuits stationed in Japan introduced Nanban maps. Portuguese explorer, Ignacio Moreira, who entered Japan in 1590 and stayed for two years, improved Japanese cartography by charting more precise coastlines. Nanban maps continued to be used during the period of isolationism, allowing European influences to transcend the borders put up by the Japanese. Starting in the 17th century, European cartographical ideas, tools, and techniques assimilated into Japanese mapmaking. The European era of influence on Japanese cartography produced more scientifically accurate maps reminiscent of traditional modern-day political maps.

European-influenced maps also retained distinctive Japanese characteristics, such as their modified orientation that placed the Pacific Ocean in the center, the Western Hemisphere on the right, and the Eastern Hemisphere on the left. This was meant to propagate a perspective from which Japan was at the world’s center. Also, Nanban maps retained their decorative qualities that kept them from being classified as political maps. Thirty world maps currently exist that were made in the Nanban tradition. Nanban maps were especially influenced by the world map of Abraham Ortelius, while the maps of well-known cartographer Matteo Ricci served as alternatives to Buddhist cosmography in the later Edo period. Xavier, who lived in Japan until 1551, introduced the idea of the spherical earth to the Japanese.

Though other sources place the origins of Japanese
The Evolution of Japanese Cartography

A Nanban world map, reflecting early improvement in the scientific accuracy of Japanese cartography

cartography in the Nara Period, 710 to 784, when land reclamation associated with the rise of Buddhist temples prompted creation of paddy-field maps, most scholars agree geographic maps were first seen in Japan during the Taikwa Period. In the year 646 the Japanese government ordered a survey of provincial borders. They had “cadastral” or Denzu maps made, showing the proportions, worth, and possession of land, chiefly for taxation. These maps were thorough, and noted the locations of both personal property and geographic landmarks. Later, Japan transitioned from divided provinces to a centrally run state that restrained private land ownership. When noble families ignored the edict and settled on private land, Shoenzu maps were made to delineate firm boundary lines of provinces to settle border disagreements. These topographical maps made use of the compass rose and charted distances between the postal stations. Standards of measurement existed, but during these early years precision was often valued over accuracy. Borders were rarely clarified, as artists instead chose to heighten the extreme detail within their existing maps.

The first general maps of the Japanese archipelago were made during the Heian Period, circa the 8th to 12th century. They are traditionally credited to Buddhist priest Gyogi-Bosatsu who was an expert on infrastructure. Anachronistically, however, this map is centered at the Province of Yamashiro, meaning the earliest it could have been made was the end of the Nara period. Pre-modern Gyogi maps that originated in AD 805 continued to be used in the Tokugawa and Meiji periods as nostalgic representations of a geographically and politically changing Japan. Gyogi-style maps remained popular for eight centuries and were thought to be the most accurate type of Japanese map at the time. The earliest known map of Japan as a state was made in 1305. Though it was detailed and included each of the 578 provinces as well as the population, it contained a number of nuances. In particular, the south was oriented at the top of the map, certain provinces were largely out of proportion, and the given population, seven million, was too high for this period.

The Gyogi map remained on the market until 1656 and proved influential to Chinese, Korean, and European maps. The first map of Japan printed in Europe was modeled after a Gyogi map and was created by Ludoisco Teixera then distributed by Ortelius in 1595. Ortelius studied Gyogi maps thoroughly, which helped him produce a map of Japan that was more accurate than all of his previous maps. Again, these maps were subject to what the populace believed were important locations. Mapmakers chose to include locations like Gando, an island south of Japan, and Rasetsu, a province north of Japan. Even though these areas were not part of Japan, they were important to the Japanese, as signified by their adoption into social and cultural lore. An important cartographical advance during this time was the commonly accepted portrayal of Honshu, Kyushu, and Shikoku as the three main islands of Japan, while the northernmost island of Ezo suffered a more fluctuating status dependent on politics. The uncertainty of territory fostered a malleable perception of ‘insider’ and ‘outsider’ in Japan.

Another type of Japanese map influenced by the Europeans is the Jotoku-style map. These combine characteristics of the Gyogi-type maps with the coastal accuracy of the Nanban maps. Jotoku maps represent “the influence of European ideas and knowledge from the late sixteenth century, but at the same time they represent a synthesis of indigenous tradition and improvements in knowledge from both Japanese and European sources.” They show a marked improvement from the Gyogi maps, portraying more accurate shapes and scales of locations like Kyushu. One specific Jotoku-style map, the Kawamori map from circa 1627, utilizes European place-names in its representation of Japan, making it evident that the Kawamori creators drew on European sources.

Jotoku-style maps were heavily influenced by European pilots who amended and revised the Gyogi maps they obtained. The scientific accuracy and “chart-like” attributes that characterize Gyogi maps can be attributed to the pilots’ need for precise navigational tools. The pilots mapped several uninhabited islands off the Japanese coast for the first time. The Kyushu coast was depicted in more thorough detail, “reflecting the island’s importance in sixteenth-century trade that from 1545 was conducted mainly with the Portuguese.” The Kawamori is also important because it influenced the creation of future European maps. Several later Italian-made maps resemble the Kawamori map and include similarly emphasized locations. Jotoku-style maps represented an amalgamation of knowledge from both European pilots and missionaries, navigators who required accurate maps for their
voyages and recorded new locations they encountered along the way. The transition from *Gyogi* maps to more chart-like *Jokuto* maps was an important milestone in the mid-16th century for Japanese cartography.

At the turn of the 17th and 18th century, mapmaker Ishikawa Ryusen’s general maps of the Japanese nation and townships were more decorative than accurate. His were intended as practical travel aides, but are considered less accurate than the *Gyogi* maps that came before his. Again, personal preference and individual expression in Japan took precedence over a linear, scientific approach to mapmaking. One of the first major maps to take a strictly scientific approach was that of Nagakubo Sekisui in 1779, which was a complete map of Japan with an accurate scale, the first use of meridians, the inclusion of the most locations, and a few added ornamentations. Many later maps were modeled after Sekisui’s, whose work remained free from European influence.

Another important contribution of European knowledge to the mapping of Japan was the use of the European terrestrial globe starting in 1580. In 1592, Spanish envoy Juan Cobo presented a terrestrial globe with Chinese place-names to the shogunate. European terrestrial globes were often imported by Christian missionaries and employees of the Dutch East India Company as gifts to the shogunate. The emperor first commissioned a Japanese terrestrial globe in 1605. Its geography, which is derived from a Nanban map, depicts a worldwide oceanic trade route beginning in Portugal. Although globes represented another important step in the European-scientific direction, there continued to be European terrestrial globes were made in the late 17th century based on the Buddhist conception of the world. The movement to integrate European knowledge with the Buddhist image of the earth became stronger in the 19th century, especially after the transfer of European surveying methods and instruments was well established. Even as original Japanese maps remained in use, these instruments allowed the maps to be revised for accuracy more frequently and efficiently.

In particular, European surveying techniques flourished in Nagasaki, a burgeoning international trade port. The Portuguese, rather than the Dutch, were influential in bringing European-style surveying to Japan. The works of Portuguese Jesuit Pedro Gomez were pivotal in the geographic compositions of teachers and students studying surveying. Certain Japanese surveyors were even educated directly by Jesuit and Portuguese navigators. Terminology used by the Japanese in surveying, such as *piloto*, meaning computation or calculation, have Portuguese roots. Unno considers it noteworthy that no evidence exists of any Dutch influence on Japanese surveying, suggesting the Dutch functioned merely as transmitters of Portuguese information. The misconception of Dutch influence had been perpetuated throughout the Edo period partly because of the endurance of the unique Dutch trading privileges and partly because of the tendency to avoid anything Portuguese after the shogunate’s ban on Christianity. The Portuguese were known for their “evangelical zealotry,” which contrasted the neutral nature of the mercantilist Dutch. With the inception of the Tokugawa period, the Dutch were effectively the only Europeans that Japan allowed to have a direct presence in the nation. This shows another way the Japanese citizens molded their history into their maps. Methods they considered important and acceptable - in this case, those of the Dutch - was adopted into their cartographical practices.

Despite European influence on cartography, it is important to remember that the Japanese government played a crucial role in asserting the importance of mapmaking in Japan. As far back as 796, the Japanese government ordered the creation of provincial maps. Throughout the entirety of the Tokugawa shogunate there were five instances under which the leaders commissioned large projects to compile provincial maps. An important function of maps at this time was to enable the government to keep track of where people lived to ensure accurate allocation of taxes. Some surveys calculated the value of land based on the amount of rice that could be harvested in its soil. Such maps contained detailed depictions of mountains, fields, villages, and bodies of water. Domestic maps during the Tokugawa period, however, suffered from several inaccuracies. Surveyors continually rounded their measurements downward because the hemp rope used to make measurements stretched and contorted with moisture, making the grid-based area calculation method insufficient for measuring irregular non-rectangular areas.

The influence of Matteo Ricci’s maps made its way from China to Japan, symbolizing the greater movement of European knowledge to Japan. Starting in 1605, Ricci’s maps were incorporated into the geography and astronomy curriculum at the Jesuit academy in Kyoto. Almost all subsequent Japanese world maps were based on Ricci’s. One reason his map is so influential is because it was written in Chinese, an accessible language to many Japanese scholars. It is interesting to note that some European place-names appear on the Japanese world maps because, although Japanese scholars could read Chinese characters, it was difficult to translate proper names into the Japanese syllabary, so they borrowed the place-names from the Jesuits.

Ricci’s world maps provided the impetus for *Bankoku-sozu* maps in 1645, which were the first European-style world maps to be produced within Japan. These maps again show European influence while also retaining non-
Western distinctions. Bankoku-sozu maps were oriented with the east at the top, putting the Americas toward the North and Europe and Africa toward the South. They were printed on a scroll, and passed through several transitions of use. Though increasingly accurate, these maps served decorative purposes in homes and were presented as certificates to surveying students. Unfortunately, the quality of Bankoku-sozu maps deteriorated as they were revised. After 1646, publishers realized the commercial potential of Bankoku-sozu maps and began printing them in encyclopedias and other works intended for the general public. Literacy in Japan continued to grow to almost 50 percent of the male population by the mid-18th century, which increased the utility of maps for Japanese citizens.

Though Dutch presence was absent from Japanese surveying, their influence was tangible in other areas. Japanese education through Dutch materials, known as “Dutch-learning,” flourished in the mid-18th century and significantly influenced Japanese cartography, especially during the transitional time for the shogunate. Tokugawa Yoshimune, who ruled from 1716 to 1745, was a significant reformer and presided over a successful period of economic development. Economic prosperity brought more and more Dutch merchants into the Japanese market and spurred reforms in areas such as the Japanese calendar, agriculture, and Neo-Confucianism. In addition to those who were proficient in diplomatic and mercantile business, numerous Japanese scholars began studying the Dutch language which allowed them to translate many Dutch cartographic works into Japanese.

An interesting facet of the European-Japanese amalgamation of knowledge was confronted in the new world maps. Cartographers encountered difficulty in deciding how to map the Sakhalin area, which was still under exploration and was represented in conflicting ways on European maps. The compilers, striving for accuracy, drew from the most reliable information that existed about the coast of Sakhalin, which was obtained by Mamiya Rinzo during his voyage there in 1808 and 1809 as well as a Chinese Jesuit atlas from 1718 that contained a complete depiction of imperial territory. Overall, the final product was similar to European depictions at the time, but also forged new cartographic paths, being the first map in the world to show the Mamiya Strait.

Japanese political maps in the early modern era were characterized by their lack of politicization, and were only faintly influenced by the “authority and accuracy” that dominated European and colonial maps. Yet, Japan shared similarities with Western cartography in that both linked geographical knowledge with power. What made early Japanese cartography unique is that it increased the strength of the Japanese people as a whole, not the exclusive interests of the government. It “was not dominated by governing authorities, nor was it the vehicle of hegemonic power.” Early cartographers “ultimately refrained from positioning themselves in overtly political ways.” Since maps were not restricted to governmental domain, they could be widely disseminated and understood by the Japanese. Japanese cartographical knowledge flourished, therefore, in that its “meaning [was] not imposed by a singular authoritative source, but generated by the circulation of maps and the multiplication of mapping tropes.”

Due in part to the fact that the shogunate relied on the daimyo and the “parcellized sovereignty” in which the daimyo divided the island, regimental authority was restricted. Japanese early modern cartography processes were accessible, and “[t]he free flow of geographic information had the unintended effect of leaving the discursive field of mapping open to the innovations and interpretations of non-elites.” Tokugawa maps were rarely made confidential by the government, and were sometimes commercially reproduced.

By the end of the 1500s Japan conducted trade with the majority of the Far Eastern states, including the Philippines, Siam, Annam, and Java. It was at the end of the 16th century that European maps appeared in Japan, the first being a world map brought from Rome in 1590 to the Imperial administrator Toyotomi Hideyoshi. European maps made for China were available in Japan as well.

Japan suffered a severe withdrawal from foreign relations and hence, new knowledge during its period of isolationism. Japan interacted only with its immediate neighbors, Korea, China, and the Ryukyu Islands before being introduced to European knowledge by the Portuguese and Spanish. Occasionally, maps delineated territories of
Japanese cartography underwent remarkable revision at the latter end of the Tokugawa era, during which its previously detached nature was “confronted directly by the universalizing forces of modern geography and cartography.” Dutch maps were the first to be translated, but by the late 18th century Japanese scholars began working with foreign cartography, such as that of Russia. In 1804, Russian envoy Nikolai Rezanov helped a shipwrecked crew return to Japan and brought several maps to Japanese authorities for translation. These, with other maps the shipwrecked Japanese crew had obtained, made a significant collection of Russian-based Japanese cartographical knowledge.

This development was significant in light of the rising pressure from foreign countries, such as Russia, for Japan to establish international commercial relations. In 1807, therefore, the shogunate ordered the astronomical observatory in Edo to create a new world map for international diplomatic use. The astronomers collected sources from Japan, China, and Europe for this map, and in 1810 they completed a map of the Eastern and Western Hemisphere entitled Shintei bankoku zenzu, or “Newly Revised Map of all the Countries.” Like some earlier Nanban maps, it depicted the Japanese archipelago in the center of the world and included supplementary hemispheric maps centered on Kyoto in the margins.

“Cartographic influence extended so far as to impact the political philosophy of the time”

In the end of 1700s, the arrival of Russian envoys and traders in the Kuril Islands and Ezo modernized Japanese cartographic techniques. Maps were highly valued during this period, often displaying an aura of prized rarity. One anecdote that shows the globalization of maps was the story of Takahashi Kageyasu. In 1828, court official Takahashi Kageyasu secretly traded several books and a small general map of Japan with Phillip Franz von Siebold in exchange for some Russian works and a newly-made map of Dutch holdings. This shows that foreign cartographical knowledge was a commodity during the Tokugawa period and that Japanese authorities attached great significance to maps. It also suggests that foreign maps were sought-after imports, as more recent prints of Japanese maps took on a more classified character.

The incentive to survey and produce more extensive maps was driven by a subtle urgency, which in the light of international trade relations prioritized documenting the coastline. Ino Tadataka was a surveyor and mercantile...
mapmaker who undertook the first surveys of Japan’s coastline in 1800, producing the first accurately measured maps of the Japanese islands. Unlike the shogunate provincial maps, “these were guarded as state secrets… which indicates that the security of boundaries, both geographic and political, was acquiring new meanings in the early 19th century.”47

Tadataka ushered in the modern period of Japanese mapmaking with his extensive undertaking to survey the entire country of Japan in the sixteen years between 1800 and 1816. By the time of his death, he had compiled 225 maps of the Japanese land. Tadataka’s meticulous attention and practical scales made his maps very accurate and provided an excellent segue into the use of scientific methods in cartography.

A second effect of Japan’s political entanglement with Russia and the domestic unrest in rural and urban areas is what Yonemoto refers to as the “antipolitics of pleasure.” During this time, from the mid-18th through mid-19th century, Japanese cartographers began to focus on the outside world, driven by the allure of unknown places and exotic customs. They forayed into sometimes fictitious mapping travel guides and imaginatively satirical maps.48

Japanese techniques of mapping became increasingly standardized and widespread. By 1821, Japan had more than nine hundred political maps at its fingertips. Simultaneous to the fictitious escapist maps of the time, the science and accuracy of mapmaking became highly prized as well. Mapping instruments and methods became more meticulous. Throughout the 17th and 18th century Japanese cartography was heavily influenced by European ideas, methods, and instruments, such as the compass and astrolabe as Japan began to open itself up to European knowledge again. The Rangakusha scholars specialized in the exploration of European knowledge, and their first product was an encyclopedia of maps of Japan, including the first copper-engraved map.49 This encyclopedia served as the premiere source of geographical knowledge for many Japanese citizens for a long time.

Cartography in the Tokugawa Era influenced future eras of mapmaking in Japan. It led to comprehensive land reform in the Meiji Era and promoted a unified national identity in Japan. The sweeping reforms of the Meiji-era government (1868-1912) included a cartographic revolution in which surveying and mapmaking were integrated as part of a “comprehensive land reform policy and the creation of a national defense system.”50 This had significant effect on the mindset of the Japanese. Notions of territory and borders became linked to the concept of Japan as a united nation-state. Maps were an important stepstool to Japan as it entered the 20th century, which was posited to develop into the “Pacific Age.” Schools adopted standardized curriculums of geography that emphasized “the connection between region, nation, and world,” which, along with the Meiji centralization of the mapmaking process in the hands of the state for the purpose of standardizing procedures for measuring and representing land, clarified mapping meaning and purpose.51

The importance of mapmaking in Japan continued in the 1900s, when scholars realized the importance of preserving their cartographic history. In the early 20th century many government and scholarly efforts began to track, organize, and catalogue historical Japanese maps. Scholars endeavored to collect the extant remains of ancient Japanese maps for study. Their collections were displayed at the Imperial University of Tokyo and the Japanese Institute in Berlin in 1934 so that these maps could be shared with the populace.52

In conclusion, European scientific knowledge had immense influence on Tokugawa-era political maps, making them increasingly thorough and accurate. Yonemoto suggests that Tokugawa-era mapping laid the foundation for nationalism and unity by making spatial knowledge accessible and allowing for the Japanese to better know the geography of their nation. Unno concludes that Japan’s “special relationships with the outside world at various times in its history” shaped its cartographical history in unique ways. While isolated and independent during the Edo period, Japan still absorbed European influences into its maps. Maps such as the Gyogi, Jokuto, and Bankoku-sozu each espoused various European influences. The Portuguese introduced surveying and navigation instruments while banned in 1630. The Dutch influenced empirical studies and catalyzed Japan’s scientific view of the earth. This movement toward science launched forward with the introduction of the heliocentric Copernican system as well as the translation of Dutch world atlases and globe-making manuals. The peace that characterized the Edo period was conducive to allowing interest in culture and mapmaking to flourish. Japanese maps remained distinct throughout the European-led modernization, which served to aid in the acceptance and endurance of European cartographical techniques.

Olivia McCaffrey is an International Studies major, Class of 2017
15. Grubbs, 189.
16. Frier et al, case 78.
17. Grubbs, 190.
18. Treggiari, Roman Marriage, 466.
21. Ibid.
22. Ibid.
25. HG 2015.
26. Treggiari, Roman Marriage, 466.
27. Katz, 87.
29. Frier et al, cases 84 and 86.
31. Ibid.
33. Ibid.
34. Katz, 94.
35. Treggiari, Roman Marriage, 476.
36. Ibid.
37. Ibid, 471.

The Evolution of Japanese Cartography
By Olivia McCaffrey

4. Ibid, 2.
5. Yonemoto, 175.
6. Unno, 347.
8. Ibid, 349.
10. Ibid, 378.
11. Ibid, 347.
14. Yonemoto, 175.
15. Ramming, 17.
16. Unno, 386.
17. Ibid, 390.
20. Ibid, 393.
21. Ibid.
22. Ibid, 394.
25. Unno, 405.
29. Yonemoto, 177.
30. Ibid.
31. Ibid, 176.
32. Ibid, 3.
33. Ibid, 4.
34. Ramming, 19.
35. Ibid.
36. Ibid.
37. Yonomoto, 1.
38. Ibid, 176.
40. Ibid, 2-3.
41. Ibid.
42. Ibid, 173.
43. Unno, 438.
44. Ibid, 439.
45. Ramming, 17.
46. Ibid, 20.
47. Yonemoto, 173-174.
51. Ibid, 175.
52. Ramming, 17.