

The Consul and the Commodore: American Cartography of Nineteenth Century Formosa

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Introduction

In 1854, Commodore Matthew Perry detached two ships, *Macedonian* and *Supply*, from his expedition to Japan. Perry ordered these ships to search for coal and shipwrecked sailors near Kelung in northern Formosa.¹ Lieutenant George Henry Preble and Reverend George Jones both created maps that would facilitate the extraction of coal; however, no shipwrecked sailors were found. The Perry expedition maps were published along with the expedition report and were probably available to many readers -- 5,000 copies were printed in 1856.² About fifteen years later, in December of 1866, General Charles William Le Gendre arrived in Amoy to take the post of U.S. Consul.³ Le Gendre's maps were harder to find than Perry's, but they still appear to have been influential. Le Gendre spent much of his first year as consul dealing with the *Rover* case -- an incident where American sailors on the bark *Rover* were shipwrecked on Formosa's southern coast and then killed by aborigines. His map *Southern Formosa* described the travels he undertook as a result of the *Rover* case. Le Gendre created a second map titled *Formosa Island and the Pescadores*, dating from 1870. This second map was far more detailed than the extant maps of Formosa and most subsequent nineteenth century maps were not as informative.

The maps of Preble, Jones, and Le Gendre showed the United States's interests and objectives with respect to Formosa over the period from 1854, when Preble and Jones visited Kelung (in the north), to 1872, when Le Gendre published the final version of *Southern Formosa*. The U.S. had three major Formosan objectives over this fifteen year period: locating coal for refueling its steamships; recovering shipwrecked sailors, particularly American ones, that were believed to be on the island; and increasing its knowledge of the island, starting with Preble's map of Kelung harbor and ending with Le Gendre's extensive island-wide map of commercial products. Preble and Jones's maps were intended to aid U.S. coal-extraction in northern Formosa, and Preble's map was also

¹ The names Formosa and Taiwan refer to the same place. The Portuguese called the island Formosa while the Chinese called it Taiwan.

² Francis L. Hawks, compiler, *Narrative of the Expedition of an American Squadron to the China Seas and Japan, Performed in the Years 1852, 1853, and 1854, Under the Command of Commodore M. C. Perry, United States Navy....*, Vol. 1 (1856; reprint, New York: AMS Press, 1967), frontmatter.

³ Le Gendre was born in France and emigrated to America. He fought in the American Civil War, during which he attained the rank of brigadier general but also lost his left eye. Samuel Stephenson, "Charles William Le Gendre," <http://academic.reed.edu/formosa/texts/legendrebio.html>, accessed 10.19.2007.

an aid for ships navigating Kelung Harbor. Le Gendre's series of southern Formosa maps were an outgrowth of his diplomatic work and travel with respect to the Rover case. His 1868 and 1872 maps had significant value for persons interested in the aborigines on the southern coast. The 1868 map in particular had a wealth of data on aborigine tribes. The Consul's 1870 island map was intended to increase the U.S. government's commercial knowledge of Formosa. By the end of this fifteen year period U.S. interests had expanded to include several commercial products spread over the entire island.

Examining these maps shows that visiting an area changed the way a cartographer viewed that area. Since Preble, Jones and Le Gendre came to Formosa with certain things in mind, those things received the most attention on their maps. Also, the maps were to serve in part as informative illustrations to explain the travels of the Consul and the Commodore. Finally, Preble and Le Gendre used more precise or scientific techniques than Jones. This was partly dictated by the goals of their map -- Jones made a walking map for locating coal mines while Preble made a sailing chart for navigating a harbor. A misstep on Jones's map would bring a stumble or an hour walking the wrong direction. A misstep on Preble's map could mean the destruction of an entire ocean-going vessel. Le Gendre's interest in producing high quality cartography was probably a main reason for his use of more scientific methods.

Informative Illustrations

These maps were informative illustrations. In addition to data on coal, shipwrecked sailors, and commercial products, the maps of the Perry expedition and Le Gendre showed routes taken by the two parties. This was necessary for explaining their travels to government officers in Washington D.C. who were unfamiliar with the geography of the regions visited by Perry and Le Gendre. The inclusion of travel routes may also have appealed to civilian travelers contemplating taking similar routes themselves. Perry's published expedition report included a map titled *Chart of the World Showing the Track of the U.S. Steam Frigates* that showed the course taken by the expedition on its circumnavigation of the world and Le Gendre included travel routes on many of his maps, including *Southern Formosa* and *Formosa Island and the*

Pescadores.⁴ The maps provided geographical context for Perry and Le Gendre's missions. They showed features such as coastlines, mountains, boundaries and travel routes in a medium that could capture all those features simultaneously and present them far more clearly and accessibly than verbal description could. The maps were necessary for a thorough understanding of the reports.

Le Gendre's maps of southern Formosa provide a good example of this informative illustration aspect. Those maps were created in order to explain to the Consul's superiors the results of his diplomatic efforts in a region largely unmapped by westerners.⁵ The maps' titles are a clear indication of their purpose: the first was called *Map to Accompany Dispatch 18 to the U.S. Minister at Peking*, showing its function as an informative illustration, and the second was titled *The Rover Case*, which confirms the focus of the map and the reasons for its existence.⁶ The maps show the route traveled by Le Gendre and include a wealth of information on the tribes he negotiated with. Their enclosure in reports on the Rover case to the U.S. Minister at Peking and the Secretary of State lends additional support to the theory that these maps were produced to help U.S. foreign affairs officials understand what Le Gendre was doing with respect to the *Rover* case.

The Perry Expedition Maps

The *Macedonian*, commanded by Captain Joel Abbot, and the *Supply*, commanded by Lieutenant Commanding Sinclair left Simoda, Japan for Kelung, Formosa on June 29, 1854.⁷ Their two objectives, as stated in the official 1856 report to Congress,

⁴ *Chart of the World Showing the Track of the U.S. Steam Frigates Mississippi, Susquehanna, and Powhatan*..., drawn by Edwd. Sels, engraved by Selmar Siebert, lithographed by J. Bien 60 Fulton St. N.Y. Published with Hawks, *Narrative of the Expedition*, Vol. 2 (1856; reprint, New York: AMS Press, 1967).

⁵ See page sixteen for descriptions of contemporary maps of south Formosa.

⁶ Charles W. Le Gendre, *Map to Accompany Dispatch no. 18 to the U.S. minister at Peking*, located in U.S. Department of State. *Despatches from United States Consuls in Amoy, 1844-1906*. Vol. 3, February 25, 1864 – April 21, 1868. RG 59, National Archives. Washington: 1946. Microfilm, no. 100, roll 3, near frame 889. Map included in dispatch no. 18, addressed to Anson Burlingame, U.S. Minister at Peking, from Le Gendre, U.S. Consul at Amoy. Dispatch no. 18 sent November 8th, 1867.; Le Gendre, Charles W. *The Rover's Case: South Formosa Id.*, located in U.S. Department of State. *Despatches from United States Consuls in Amoy, 1844-1906*. Vol. 3, February 25, 1864 – April 21, 1868. RG 59, National Archives. Washington: 1946. Microfilm, no. 100, roll 3, near frame 1144. Map included in dispatch no. 58, addressed to Seward, Secretary of State, Washington D.C., from Le Gendre, U.S. Consul at Amoy. Dispatch sent April 10 or 12th, 1868.

⁷ Hawks, *Narrative of the Expedition*, 1:496, 498.

were both of a nautical nature. They were to search for shipwrecked American sailors and also determine the practicability of procuring Formosan coal to re-supply steam ships.⁸ Perry's June 18, 1854 letter to Abbot included the following instructions:

The object of your visiting this island is to carry out the instructions of the Navy Department touching certain inquiries and researches to be made with respect to the fate of several missing persons, whose relatives and friends entertain a hope that they may still be alive and possibly detained in captivity, either in the islands belonging to the empire of Japan or in Formosa. ...

Besides the business of prosecuting the researches for the missing persons above alluded to, it is important that the coal localities of Formosa should be carefully examined, in view of ascertaining the feasibility of obtaining supplies from that island; the convenience of procuring and shipping it; the productiveness of the mines; the quality of the coal for steaming purposes; its costs per ton of 2,240 pounds at the mines; the convenience and cost of shipping, &c., &c.⁹

As per the instructions in Perry's June 18, 1854 letter, Abbot left Simoda on June 29 and set a course for Kelung. The *Macedonian* arrived in Kelung harbor on July 11 after a difficult twelve day passage involving an opposing current, head winds, and tempestuous weather. The *Supply*, which had been separated from the *Macedonian* on June 30, did not reach Kelung until the 21 of July.¹⁰

Although Perry did not specifically list map-making in his June 18 orders to Captain Abbot, surveying Kelung was still part of the overall mission. The expedition record stated that one of the purposes of the expedition was to create accurate charts for "nautical men of all countries."¹¹ Accurate charts of Formosa would have helped the United States (and nations with access to U.S. charts) accomplish its goals in that region, whether those goals were finding coal and shipwrecked sailors, or navigating Kelung Harbor. The expedition record explained:

As no opportunity was ever lost by the squadron of obtaining accurate information that might benefit nautical men of all countries, while the *Macedonian* was at Kelung, Lieutenant Preble was employed, under Captain Abbot's orders from the Commodore, in making a survey of the harbor; in this work Passed Midshipman Jones volunteered as an assistant, and a chart was prepared by these gentlemen, the correctness of which may be relied on.¹²

Clearly the *Macedonian* undertook substantial cartographic activity, even though such activity was not itemized in the June 18 orders to her captain. Furthermore, Preble was

⁸ Ibid., 1:498.

⁹ Hawks, *Narrative of the Expedition*, 2:137.

¹⁰ Hawks, *Narrative of the Expedition*, 1:498-9. Unfortunately, the "enclosed copies of papers" regarding shipwrecked sailors were not included in the *Narrative of the Expedition*.

¹¹ Ibid., 1:501.

¹² Ibid.

not the only person to produce a map while the *Macedonian* was at Kelung -- Chaplain George Jones created a map of the coal fields near Kelung harbor.

Procuring coal for steam ships was one of the Perry expedition's main foci and as we shall see coal featured prominently on both Preble and Jones's maps of Kelung and the surrounding area. Francis Hawks, the compiler of the Perry expedition's official record, clearly stated the importance of coal for the United States in the mid nineteenth century:

Direct trade from our western coast with Asia became therefore, a familiar thought; the agency of steam was, of course involved, and fuel for its production was indispensable. Hence arose inquiries for that great mineral agent of civilization, *coal* [original italics]. Where was it to be obtained on the long route from California to Asia?¹³

Fuel for steamships was “indispensable” and as it happened, that fuel could be found in northern Formosa, near Kelung harbor. Hawks placed a very high value on coal. While discussing Dutch exports of Japanese gold, he wrote that “In the beginning of the Dutch trade, the annual export was £840,000 sterling; and in the course of sixty years the amount sent out of the Kingdom, through the Dutch alone, was from twenty-five to fifty millions sterling.”¹⁴ Despite the value of gold exports, extensive silver mines, and other metals found in Japan, the highest value was placed on coal: “Viewed in the light of commercial intercourse between the two hemispheres, this coal is worth more than all the metallic deposits we have enumerated.”¹⁵ Given this high value, it is less surprising that the search for coal was one of two primary objectives of the Perry expedition:

The instructions from the [state] department designated the East India and China seas and Japan as the field of service; but the great objects of the expedition were to procure friendly admission to Japan for purposes of trade, and to establish, at proper points, permanent depots of coal for our steamers crossing the Pacific.¹⁶

Coal for steamships was of huge importance to the Perry expedition. Japan might be opened, but without adequate and properly spaced coal depots American traffic with Japan would be significantly more difficult.

Before describing Preble and Jones's maps of north Formosa, it should be noted that Hawks included a map of the entire island of Formosa in the section on coal in volume 1 of the expedition report. This map, titled *The Island of Formosa*, was

¹³ Ibid., 1:75.

¹⁴ Ibid., 1:60.

¹⁵ Ibid.

¹⁶ Ibid., 1:77.

reasonably detailed, particularly in the north where there is a little more topographical data and the rivers reach farther into the interior rather than being cut off near the coastline. This increase in interior data points may be a result of Chaplain Jones's travels in search of coal. The map also had the words "Coal Fields" written and underlined in the north near Kelung harbor.

Preble's Map

Captain Abbot wrote in his letter to Perry dated August 26, 1854 (when the *Macedonian* was at Hong Kong) that, "The Chart by which I entered the [Kelung] harbor is very erroneous in many respects, and should give place to a better and more recent survey."¹⁷ Perhaps because of his prior experience with surveying, it fell to Lt. Preble to undertake that "better and more recent survey" during the *Macedonian's* stay at Kelung.¹⁸ An excerpt from Preble's diary entry on June 14, 1854 read, "The Commodore has decided to send our ship to Keelung [sic] a port on the Northern end of the Island of Formosa. I am to survey and make a map of the Harbor."¹⁹ Preble's work on coastal surveys in the U.S. and his assistance with the surveying of the Bay of Tokyo and Hakodate made him a natural candidate for the job of surveying Kelung harbor.²⁰

Preble's map *Kelung Harbor* was first and foremost a nautical map designed to help vessels navigate the harbor. The map gave extensive soundings of Kelung Harbor, sailing directions for the approach to the harbor, and drawings of several rocks as well as the surrounding land as if viewed from a ship sailing towards the harbor. The soundings were laid out in clear lines -- probably along the course taken by Preble's survey boat. There was also data on anchorages, hills, what appear to be agricultural fields, and mentions of three forts (one in ruins, one old, and one new) and a few villages.²¹

¹⁷ Ibid., 2:144.

¹⁸ Rear Admiral George Henry Preble, U.S.N., *The Opening of Japan: A Diary of Discovery in the Far East, 1853-1856*, ed. Boleslaw Szczesniak (From the original manuscript in the Massachusetts Historical Society; Norman, OK: University of Oklahoma Press, 1962), xvi.

¹⁹ Ibid., 202.

²⁰ Ibid., xviii, xvi.

²¹ There are three locations specifically noted as villages and also marked with a series of dashes. There are also other named locations in areas where I would expect to see a village that are marked with similar dashes. Although the latter locations are not specifically called villages, it seems likely that they are also villages. It is this possible confusion that prevented me from being able to confidently state the number of villages. Lieutenant G. H. Preble and Passed Midshipman Walter F. Jones, surveyors, *Keelung Harbor*:

Interestingly, many locations on the map bore names relating to the expedition or its members, i.e. "Macedonian Point," "Abbot's Point," "Sproston's Rock," "Breeses Cove," and "Jones Pt."²²

In addition to the abundance of nautical data, Preble included various mentions of coal and possible places where it could be loaded onto ships. His addition of coal to the harbor map shows how the cartographer's interests were often reflected in the maps. First, in the southwest corner near Kelung town he noted a channel that was "navigable for boats to the coal mines."²³ Boats could sail up that channel and return to harbor with coal. Preble also extended his chart south and east along the coast to reach "Coal Harbor:"

Coal Harbor is so called from its proximity to the coal mines, opened by the Chinese on the hillsides of the Southern shore of Quar see kow Bay. It offers anchorage and shelter for one or two ships only. Should the mines ever be worked by Europeans, the coal (which is of good quality) could be conveyed to Harbor Rock by means of a Rail Road along the West shore of Quar see kow Bay at the base of the hills. A short pier from the North side of Harbor Rock would enable a ship to lie alongside in 3 to 4 fathoms, and receive or discharge her cargo.²⁴

The Americans were considering using Kelung, Formosa as a refueling point for their steamships. Apparently, with a little investment Coal Harbor could become an admirable refueling point and even with no investment at all coal could be had by sending boats up the channel near Kelung town.

Lt. Preble, Captain Abbot, and the British publication *China Pilot* all considered the coal to be one of the most valuable features of Preble's chart *Kelung Harbor*. Given the U.S. interest in coal (which likely extended to the British since they were also using steamships at the time) it makes sense that data regarding coal would be valued highly.

On July 23, 1854 Preble wrote in his diary that

Some coal mines having been discovered on the sea coast to the Eastward of the harbor, I extended my survey to include the cave and bay in front of them and so think I have greatly added to the value of my chart.²⁵

Formosa Island, drawn by Edwd. Sels, engraver Selmar Sieber, lithographer J. Bien of 60 Fulton St. N.Y. Scale is 1/2 nautical miles equals 9.5 centimeters, 1854. Published with Hawks, *Narrative of the Expedition*, Vol. 2.

²² Ibid.

²³ Preble and Jones, *Keelung Harbor: Formosa Island*.

²⁴ Ibid.

²⁵ Preble, *The Opening of Japan*, 230-231.

The presence of coal and the expedition's interest in that resource directly affected the production of the map. If those eastward coal mines had not been discovered, Coal Harbor would not have appeared on Preble's *Kelung Harbor* map. His superior, Captain Abbot, was pleased with Preble's survey and communicated news of its completion to Perry in his letter of July 22, 1854, which included the following lines, "Lieutenant Preble has perfected a good survey of the harbor [of Kelung], and an adjacent little harbor near one of the mines, that is protected against northeast winds and is almost entirely landlocked."²⁶ The Captain too was particularly interested in the coal-related aspect of Preble's chart. The 1864 edition of the *China Pilot* copied nearly verbatim the aforementioned long quotation regarding Coal harbor and the possibility of adding a railroad nearby to facilitate the transport of the black rock.²⁷ Ten years later, Le Gendre copied and cited the same phrase from the 1864 *China Pilot*.²⁸ Preble's chart had been forgotten but his mention of coal had not. Preble's map may have included excellent nautical information, but it was his data on coal that interested his contemporaries.

The production process of this chart began soon after the *Macedonian's* arrival in Kelung on July 11, 1854. Preble expected to begin his survey work the next day, "weather permitting."²⁹ Passed Midshipman Walter F. Jones volunteered to assist Preble in the task of surveying Kelung Harbor.³⁰ Preble was supposed to be assisted by an additional unnamed officer from the *Supply*, but due to the *Supply's* late arrival -- July 21 -- it is unlikely that the additional officer lent much assistance.³¹ Surveying duties kept Preble so busy that he had time for only one diary entry (dated Sunday, July 16, 1854) during his time on Kelung, in which he wrote:

As I anticipated my surveying duties have kept me at work from day light until dark and my fatigue and the prostrating heat have compelled me to forego the pleasure of keeping up my daily diary of events. The *Supply* has not yet arrived but is hourly and anxiously looked for. One of her officers was to have assisted me on the survey, but with only one assistant I have already accomplished so much that in a day or two I shall not need his

²⁶ Ibid., 142.

²⁷ Great Britain, Hydrographic Department, "Comprising the Coasts of China, Korea, and Manchuria; the Sea of Japan, the Gulfs of Tartary and Amúr, and the Sea of Okhotsk..." *The China Pilot* 1864 (4th edition), 291.

²⁸ Charles W. Le Gendre, *Notes of Travel in Formosa*, ed. Douglas Fix and John Shufelt (unpublished, from Le Gendre's 4-volume bound manuscript housed in the Library of Congress, Manuscript Room, Washington, D.C.), 35 and footnote.

²⁹ Preble, *The Opening of Japan*, 227; Hawks, *Narrative of the Expedition*, 1:498.

³⁰ Ibid., 1:501.

³¹ Hawks, *Narrative of the Expedition*, 1:498; Preble, *The Opening of Japan*, 227.

assistance. I hope to make a respectable chart of the Harbor, and as it is the first I have planned as well as executed without advice or assistance I am bound to be proud of my work.³²

That small sample is nearly the extent of the information on the Americans' 1854 survey of Kelung Harbor.

However, Preble did add one additional point about how the people in Kelung added to the difficulty of his task, and in doing so he also showed how he was attempting to use various tools and techniques to improve the accuracy of his survey:

The present inhabitants [of Kelung] are a rude thieving opium smoking *sam shu* drinking people. The exceedingly coarse [sic] cotton flags I put up as signals and which I punched full of holes and cut in shreds to render valueless, were stolen nightly from the poles, and had to be replaced in the morning before commencing work.³³

Clearly, Preble did not have a high opinion of Kelung's populace. Exactly what the cotton flags were used for is somewhat unclear. Perhaps Preble used them to mark key points, get a sense of distances (i.e. by having a uniform distance between each flag), or to help him measure angles between points to determine distances and locations. The interference from local people was not a new phenomenon for the Perry expedition. The officials at both Uraga and Yedo Bay were opposed to the Americans' surveying activities (however, they did not prevent them from occurring).³⁴ Given that Preble's map was in part intended as a navigation aid for future ships it makes sense that he would want to use survey aids such as the cotton flags to improve his accuracy.

Despite interference from the local populace, Preble and Jones completed their survey the evening of July 22. The *Macedonian* sailed on the morning of July 23 and Preble's diary entry of that day includes the lines:

I have been constantly employed in the past from daylight until dark on my survey which as far as regards the field and hydrographical [sic] work was finished last night at sundown. I have now to map it, and I think I have the material for makeing [sic] an accurate and reliable chart of the Harbor and its shores and neighborhood.³⁵

Having finished the survey, Preble began the second phase of work on his chart -- the actual drawing of the map.

³² Preble, *The Opening of Japan*, 227-8.

³³ *Ibid.*, 229.

³⁴ Hawks, *Narrative of the Expedition*, vol. 1, Uraga 238-24, Yedo Bay 330.

³⁵ Preble, *The Opening of Japan*, 230-231.

There was not a great deal on information on the specific survey methods used by Preble at Kelung harbor, but there were some mentions of survey methods used by members of the Perry expedition at other locations. Since the surveys were undertaken for the same expedition, it is likely that similar techniques were employed when higher quality surveys were wanted. For example:

The steamers continuing their course, passed between Oho-sima and Kikai-sima, or Bungalow Island, and traversed the eastern coast of the former so closely, that all its sinuosities, bays, inlets, could be marked with much accuracy. Having at meridian obtained excellent observations of latitude and longitude, as the result of the notes of the three ships, it was practicable to determine the positions of the most prominent headlands by a series of angles deduced from these observations.³⁶

Latitude and longitudinal measurements were key parts of the surveying and the use of angles and trigonometry allowed more data points to be placed on the map with greater ease and accuracy. However, simple optical observation was still important.

Jones's Map

While Preble was surveying Kelung Harbor, Chaplain Jones, assisted by Midshipman Breese, Midshipman Jones, and Master's Mate Williams, was given the task of investigating the coal mines in north Formosa.³⁷ As we saw above, the discovery of coal prompted Preble to extend his map to include Coal Harbor and include the newfound resource. The Chaplain created a sketch map of the area around Kelung that noted the location and direction of several coal seams.³⁸ It shows the mines overlooking Qua-se-kou bay and also the channel that ran from the southern end of Kelung harbor east towards multiple coal mines. In addition to extensive data on coal, this map also showed population centers and noted the presence of some rice fields alongside the channel running east from Kelung harbor to some mines. The Chaplain's production process was fairly simple. He and his assistants visited the mines and then drew up the map, relying primarily on simple optical observations since nothing more accurate was needed.³⁹ Indeed, the legend of the map bears the words, "This map, having been made in a great

³⁶ Hawks, *Narrative of the Expedition*, 1:489.

³⁷ All four men were originally from the *Mississippi*, but had been transferred, presumably to the *Macedonian*. Hawks, *Narrative of the Expedition*, 1:499-500.

³⁸ Reverend George Jones, *Map Intended to Show the Positions of the Coal Mines Eastward of Kelung, Island of Formosa*, 1856. Located in Hawks, *Narrative of the Expedition*, 2:155.

³⁹ Hawks, *Narrative of the Expedition*, 2:153-163.

measure from the eye simply, does not pretend to entire accuracy." Despite that disclaimer, it seemed accurate enough for its purposes.

One of their primary tools was interviewing the local inhabitants, although this was not an easy process. In his report on "The Coal Regions of the Island of Formosa" Jones wrote, "Nearly all that we have learned about the coal in this region has, therefore, been by pushing and persevering investigations, in the face of constant attempts of the inhabitants to mislead us or blind us as to the facts. They have otherwise thrown no obstructions in our way."⁴⁰ Jones believed the inhabitants reluctance to reveal information came largely from a fear of being punished by their superiors.

The coal investigation team hiked around the countryside, interviewed locals, hired guides, met with local officials, personally examined the coal mining tunnels, and also purchased coal, probably for the tests undertaken later that compared the quality of Cumberland, Formosan, and Japanese coal.⁴¹ In his report, Jones wrote, "The coal is quite abundant. I have been at eight distinct mines, and have explored twelve drifts to their termination, in most cases getting specimens of the coal."⁴² According the United States Naval Laboratory's technical analysis of the coal, the standard Cumberland coal used to determine a baseline was only 11.4 percent more valuable than the Formosan coal for the purposes of fueling steam ships. On the other hand, the Cumberland coal was about 50% more valuable than the Japanese varieties examined. It seems the team's investigative work paid off.

During this time Captain Abbot was looking for shipwrecked sailors. He did not discover much information on that subject and finally concluded that there were no shipwrecked Americans alive and waiting to be rescued on the island of Formosa. Apparently the chief mandarin of Kelung did mention a ship carrying both black and white sailors that was shipwrecked on the western side of the island. The mandarin offered to take some war junks and show Captain Abbot the site, but Abbot felt that this was a ruse by the mandarin to enlist his aid in dealing with some rebel forces near the site of the supposed shipwreck and so did not accept the mandarin's offer.⁴³ It was the coal

⁴⁰ Ibid., 2:153.

⁴¹ Ibid., 2:153-170.

⁴² Ibid., 2:153.

⁴³ Ibid., 1:499.

aspect of the mission that succeeded. Jones's map shows the location of several potential mining sites and Preble's map shows how future ships in need of coal could be brought into harbor near the mining sites. This interest in coal was still present during Le Gendre's tenure as U.S. Consul at Amoy. Although he did not mention coal on either of his published maps, Le Gendre paid attention to coal and mentioned it in his reports to the State Department.⁴⁴

Le Gendre's Maps

General Charles William Le Gendre was the next major American cartographer of Formosa. He had two main series of Formosa maps, one of the south and another of the entire island (which will be explained later). Le Gendre's series of southern Formosa maps were created to help explain the Consul's travels and diplomatic work with the aborigines in south Formosa (his object was to ensure the safety of shipwrecked sailors), and to accompany an interesting dispatch perhaps intended to defend the Consul's reputation. Once again, we can see both how his travels informed his cartography and his interests influenced the data shown on the maps. Le Gendre's travels allowed him to make significant additions to the extant cartographic knowledge on South Formosa and his extensive work with the aborigine tribes may have led to the large amount of aborigine data on his maps.

Map to Accompany Dispatch no. 18 to the U.S. Minister at Peking, dated November 21, 1867, showed the route Le Gendre traveled and also points of particular relevance to the narrative of his trips to that area. *The Rover Case: South-Formosa Id.*, dated April 12, 1868, was sent to the Secretary of State after Le Gendre had completed his negotiations with Tauketok, the local aborigine chief.⁴⁵ This map focused on relaying

⁴⁴ U.S. Department of State. *Despatches from United States Consuls in Amoy, 1844-1906*. Vol. 4, May 28, 1868 – December 31, 1869. RG 59, National Archives. Washington: 1946. Microfilm, no. 100, roll 4; Le Gendre, *Notes on Travel in Formosa*, 44; Charles William Le Gendre, *Tracing of a Sketch of the Map of Formosa Island*, located in U.S. Department of State. *Despatches from United States Consuls in Amoy, 1844-1906*. Vol. 4, May 28, 1868 – December 31, 1869. RG 59, National Archives. Washington: 1946. Microfilm, no. 100, roll 4, near frame 700. Map included in dispatch no. 43, addressed to J.R. Browne, U.S. Minister at Peking, from Le Gendre, U.S. Consul at Amoy. Dispatch no. 43 sent March 31st, 1869. Copy of dispatch no. 43 included in dispatch no. 87, addressed to the Secretary of State, Washington D.C., from Le Gendre U.S. Consul at Amoy. Dispatch no. 87 sent May 10th, 1869.

⁴⁵ The cover page of Le Gendre's dispatch gave the date of April 10 but his introductory letter gave the date of April 12. See U.S. Department of State, *Despatches from United States Consuls in Amoy, 1844-1906*.

data on the aborigine tribes in the area. Tribal boundaries, population demographics, and a short glossary were given. No other contemporary European map had a similar quantity of aborigine data. Le Gendre's 1872 map, *Southern Formosa*, covered the same area and was somewhat of a cross between his earlier two south Formosa maps.

The Rover case

Le Gendre was lead to Southern Formosa by the American bark *Rover* that wrecked on the coast of south Formosa sometime between March 9 and March 12.⁴⁶ The captain, his wife, and the crew were reported murdered (presumably by the aborigines who inhabited that region) with the exception of one person who escaped.⁴⁷ On April 2, 1867 Le Gendre arrived in Foochow and persuaded the governor generals of Fukien and Chekiang to urge the Chinese authorities in Formosa to take punitive action towards the aborigines responsible.⁴⁸ Le Gendre then commissioned the U.S. steamer *Ashuelot*, under Captain Febriger, and visited the scene of the wreck. While on the island he tried unsuccessfully to get the Taiwanfoo authorities to act. Rear Admiral Bell, U.S.N., launched a punitive expedition, but it met with failure and he returned to Takao on June 14, 1867.⁴⁹

The Chinese dispatched a military force to south Formosa on July 25, 1867. The Qing provided Le Gendre with the steamer *Volunteer* and he embarked for Formosa on September 4, 1867.⁵⁰ Le Gendre met up with Liu's force and together they marched into the south. Along the way they met William A. Pickering and James Horn who were returning from recovering the remains of Mrs. Hunt (the wife of the *Rover's* captain) and rescuing eight Bashee islanders who had been shipwrecked on the south-east coast of Formosa.⁵¹ Le Gendre met with Tauketok, who was the chief of eighteen tribes on the

Vol. 3, *February 25, 1864 – April 21, 1868*, RG 59, National Archives. Washington: 1946. Microfilm, no. 100, roll 3.

⁴⁶ George Williams Carrington, *Foreigners in Formosa: 1841-1874*, (San Francisco: Chinese Materials Center, Inc., 1978), 152-9.

⁴⁷ Le Gendre to Secretary of State Seward, 11 May 1867, U.S. Department of State, *Despatches from the United States Consuls in Amoy*, Microfilm, no. 100, roll 3, near frame 515; Carrington, 152-3.

⁴⁸ Stephenson, "Charles William Le Gendre." Uncited information in this section comes from Stephenson.

⁴⁹ Carrington, *Foreigners in Formosa*, 157.

⁵⁰ *Ibid.*, 160.

⁵¹ Carrington, *Foreigners in Formosa*, 162-3; James W. Davidson, *The Island of Formosa Past and Present: History, People, Resources, and Commercial Prospects*, (1903, reprint Taipei: SMC Publishing

southern coast, including those responsible for the killing of the *Rover's* crew. With Pickering interpreting, Le Gendre and Tauketok negotiated a treaty guaranteeing the safety of European and American sailors shipwrecked in Tauketok's territory.

Prior to Le Gendre's cartographic work there were multiple maps of Formosa, but none of them had much to say about the southern region. The Perry expedition map, *Island of Formosa*, had little to say about the southern region;⁵² Par. L Léon de Rosny's 1856 *Carte Complète Orthographique et Hydrographique de Formose* was better. It had names for sub-regions of south Formosa and even mentioned that aborigines lived in the area.⁵³ One interesting thing about de Rosny's map was that southern Formosa contained about as much information as the other regions of the island while the other pre 1870 maps I have seen contained proportionately less information on the south.

Robert Swinhoe's 1864 *Sketch Map* contained little data on south Formosa. Mostly it had coastal data such as could be gathered by ship without exploring the interior.⁵⁴ However, it does give the height of two mountains and one hill. Swinhoe may have gathered some of this data during an 1858 attempt to recover shipwrecked sailors, during which he made several overland excursions into Formosa.⁵⁵ Guérin and Bernard's 1868 map *Ile de Formose avec indication de l'emplacement des tribus aborigines* had an obvious lack of data on the southern region -- the entire area was bare.⁵⁶ There was an outline of the coast and a few coastal marks but other than that the southern tip was blank.

Inc., 1992), 118; Harold M. Otness, *One Thousand Westerners in Taiwan, to 1945: A Biographical and Bibliographical Dictionary*, (Nankang, Taipei: Institute of Taiwan History, Preparatory Office, Academia Sinica, 1999), 81-2.

⁵² *The Island of Formosa*, Ackerman Lith 379 Broadway NY, 1856. Published in Hawks, *Narrative of the Expedition*, 483.

⁵³ It is possible that de Rosny gave tribe names, but I was unable to confirm whether or not de Rosny's French spellings corresponded to the Anglicized tribe names I am familiar with. Par L. Léon de Rosny, *Carte Complète Orthographique et Hydrographique de Formose: Traduite du Chinois*, 1856, http://academic.reed.edu/formosa/gallery/Map_pages/Island_Maps/deRosny_S.html, accessed 10.07.2007.

⁵⁴ Robert Swinhoe, *Sketch Map of the Island of Formosa to Illustrate the Paper by Mr. Robert Swinhoe (Vice-Consul)*, [Lithographer] Edw[ar]d Weller, [1864], http://academic.reed.edu/formosa/gallery/Map_pages/Island_Maps/Swinhoe_S.html, accessed 10.12.2007.

⁵⁵ Samuel Stephen, "Robert Swinhoe," <http://academic.reed.edu/formosa/texts/swinhoebio.html>, accessed 10.05.2007.

⁵⁶ MM Guérin et Bernard, *Ile de Formose avec indication de l'emplacement des tribus aborigines*, 1868. Text: "Bulletin de la Société de Géographie," "Gravé par Erhard," "Paris Imp Janson.." http://academic.reed.edu/formosa/gallery/map_pages/Island_Maps/GuerinAborigineMap_S.html, accessed 10.16.2007.

The first map of southern Formosa that Le Gendre sent out in a consular dispatch was given to him by the British consulate, rather than being created by his own hand.⁵⁷ As far as quantity of data it was slightly better than Swinhoe's 1864 map, but not by much. It showed only the area of Formosa south of Takau (or Tackaaw as written on the map).⁵⁸ In addition to Takau, it showed a few Chinese villages and some coastal features. Also, the heights of two mountains were given as "300 f" and "ab. 2000 f."⁵⁹

Map to Accompany Dispatch no. 18 to the U.S. Minister at Peking was the first of his own maps that Le Gendre sent out in a dispatch.⁶⁰ It has more information than the map Le Gendre received from the British, but not a great deal more. He sent it to Anson Burlingame, U.S. Minister at Peking, on November 19, 1867. It was probably intended to help explain recent developments in the Rover case -- Le Gendre's travel into aborigine territory with Qing forces and, with the help of Pickering, his negotiation of the treaty with chief Tauketok. This map showed the route taken by Le Gendre and gave a good visual representation of the mountainous terrain he encountered near the island's southern tip. It marked the location where the *Rover*'s crew was murdered (apparently on the east side of South Bay), and also used shading to show territorial divisions between Chinese territory, Tauketok's territory, and territory belonging to other aborigines.

One of the main differences between *Map to Accompany Dispatch no. 18* and *Southern Part of Formosa* was the lack of coastal features on the later map. However, the mountain ranges were significantly more detailed and the central-eastern part of south Formosa, which was left blank on the earlier map, had been filled in.⁶¹ The jumble of hilly (or mountainous) terrain shown on *Southern Part of Formosa* was cleared up and on *Map to Accompany Dispatch no. 18* the hills and mountains were shown more clearly and tended to follow coherent lines. *Map to Accompany Dispatch no. 18* was made after Le

⁵⁷ U.S. Senate, Executive Document no. 52, 40th Cong., 2d sess., 1868, page 12.

⁵⁸ [British Consulate], *Southern Part of Formosa*, 1867. Located in U.S. Department of State, *Despatches from United States Consuls in Amoy, 1844-1906*. Vol. 3, February 25, 1864 – April 21, 1868. RG 59, National Archives. Washington: 1946. Microfilm, no. 100, roll 3, near frame 515. Map included in dispatch no. 19, addressed to Seward, Secretary of State, Washington D.C., from Le Gendre, U.S. Consul at Amoy. Dispatch sent May 1867 [no day given].

⁵⁹ Ibid.

⁶⁰ Le Gendre, *Map to Accompany Dispatch no. 18*, 1867. See footnote 6 for full citation.

⁶¹ One small observation is that the heights of the two mountains given on *Southern Part of Formosa* ("300 f" and "ab. 2000 f") have been dropped. However, the contours of the mountainous topography were more clearly delineated.

Gendre had traveled on foot through the hills and mountains depicted -- perhaps this clarity was the result of his travels.

Le Gendre's next map, *The Rover's Case: South-Formosa Id.*, was both larger in scale and covered a smaller area than the preceding one.⁶² This map confirmed Le Gendre's cartographic contribution to knowledge of south Formosa. The map marks the location of several southern aborigine tribes and intertribal boundary lines. It also includes a boundary line separating the "half breed" (to use Le Gendre's words) aborigines that lived nearer to Chinese settlements from the eastern mountain aborigines who lived further from and had less contact with the Chinese. The boundary lines and information on southern aborigines far surpassed that given by prior maps. Furthermore, the map was accompanied by an oversized page titled "Reference to the Map of S. Formosa."⁶³ This reference includes the names of sixteen tribes, the number of women and children and the number of men in each of those tribes, a short list of Koalut words with their English translations, Koalut numerals one through ten, and a sketch of the red flag that Le Gendre and Tauketok agreed would be carried by sailors from friendly vessels. In addition to the extensive aborigine data this map also includes agricultural data, a feature lacking on the previous two maps. The larger scale of this map allowed individual mountains within the ranges to be shown.

Le Gendre's 1872 map, *Southern Formosa*, was the last map in his series of south Formosa maps.⁶⁴ Again, the Consul created this map to help explain his diplomatic work, but he also intended it to help show the quality of his past service. At the time, Le Gendre was tangling with his superior at Peking, Mr. Lowe.⁶⁵ Le Gendre included several attachments with this dispatch, many of which dated from 1867 and referred to his early work with Tauketok and the treaty the two made. Although the map itself did not explicitly defend Le Gendre's reputation, it showed his 1867 route rather than his 1872 route. This suggests that Le Gendre was directing his readers' attention to his past

⁶² Le Gendre, *The Rover's Case: South-Formosa Id.*, 1868. See footnote 6 for full citation.

⁶³ U.S. Department of State, microfilm no. 100, roll 3, near frame 1144.

⁶⁴ Le Gendre, *Southern Formosa*, 1872.

http://academic.reed.edu/formosa/gallery/map_pages/SectionMaps/Smaps/LeGendre_S_Form.html, accessed 10.04.2007.

⁶⁵ Stephenson, "Charles W. Le Gendre."

accomplishments, the ones for which he received high praise, rather than his present travels.

Southern Formosa covered a larger area than Le Gendre's two preceding south Formosa maps. Data regarding the aborigine tribes was largely retained. Intertribal boundaries were omitted but to some degree can be inferred by the locations given for each tribe. The boundary line between the "half-breed" aborigines and the mountain aborigines remained. The agricultural data noted on *The Rover's Case* was omitted, but the coastal data largely remains. South Cape, South Bay, and other coastal features were noted. *South Formosa* was also the first map in Le Gendre's series on South Formosa to include soundings and Chinese characters. Topographical data on the mountain ranges has in general been retained, but in the southernmost area much of the topographical data present on the earlier maps has been omitted.

1870 Island Map and draft

The Consul's 1870 island map was the best overall English or European language map of Formosa at the time of its publication (and for several years after).⁶⁶ A previous map, Guerin and Bernard's 1868 island map, located several aborigine tribes in the northern third of the island, but most of the rest of their map was blank. Another earlier map, Swinhoe's 1864 *Sketch Map of the Island of Formosa*, also had more data on the north than the south, though it did mention a few data points in the south. In general, Swinhoe's map was more detailed than Guerin and Bernard's. Swinhoe showed the central mountain range of Formosa as a single row of peaks running north to south. Le Gendre's map was far more detailed than the two aforementioned maps. Although Swinhoe's map included a comparable number of data points in the north, Le Gendre's map was significantly more detailed elsewhere. Rather than a single row of peaks, Le Gendre showed two nearby rows running north and south. His depiction of a double row of peaks was taken up by Ravenstein and Bax, who published maps in 1874 and 1875

⁶⁶ Charles W. Le Gendre, *Formosa Island and the Pescadores, China*, Photo-Lith by the N.Y. Lithographing, Engraving & Printing Co. Julius Bien Supt., 1870.
http://academic.reed.edu/formosa/gallery/Map_pages/Island_Maps/LeGendre_S.html, accessed 10.08.2007.

respectively.⁶⁷ Furthermore, both Ravenstein and Bax make reference to a confederation of 18 aborigine tribes located on the southern tip of the island. The imitation of mountain ranges and the borrowing of data points show the value of Le Gendre's map and the influence it had on subsequent western cartography of Formosa.

This influence was lasting. Reverend William Campbell's 1896 map, *Formosa from the Latest Authorities*, showed a double row of peaks similar to that shown on Le Gendre's 1870 island map.⁶⁸ The British admiralty map number 1968 from the year 1886 cited Le Gendre directly, stating "Additions to the topography of Formosa from a map compiled by Gen. Chs. W. Le Gendre, U.S. Consul, Amoy and Formosa, 1870."⁶⁹

Formosa Island and the Pescadores accompanied Le Gendre's 1869 commerce report which was included in *A Report on the Commercial Relations of the United States and Foreign Nations, for the year ending September 30, 1869*, which was printed by order of the U.S. Congress.⁷⁰ In the preface to the section of the congressional document that included Le Gendre's work, Hamilton Fish, then Secretary of State, praised Le Gendre and called attention to his map and reports. The map contained a wealth of useful information: an understandably large quantity of commercial data, but also towns, cities, villages, coastal features such as beacons and safe harbors (though no soundings were given), cultural and historical notes, substantial topographical data, "the route travelled by the author," and a good deal of information on aborigine tribes.

⁶⁷ E.G. Ravenstein, *Map of Formosa*, 1874.

http://academic.reed.edu/formosa/gallery/map_pages/Island_Maps/Ravenstein_S.html, accessed 10.09.2007; B.W. Bax, *Island of Formosa*, lithographer Edwd Weller, 1875, mentions "London, John Murray, Albemarle St.," http://academic.reed.edu/formosa/gallery/map_pages/Island_Maps/Bax_S.html, accessed 10.14.2007.

⁶⁸ Reverend William Campbell, *Formosa from the Latest Authorities*, [lithographer J.G. Bartholomew, Edin.], scale 69.16 English miles = 1 degree, 1896, http://academic.reed.edu/formosa/gallery/Map_pages/Island_Maps/Campbell2_S.html, accessed 9.28.2007.

⁶⁹ British Admiralty, map no. 1968. Formosa Id. and Strait. Compiled from the surveys of Captains H. Kellett & R. Collinson, R.N., Lieut. M. Gordon, R.N., J. Richards, E. Wilds and G. Stanley, Masters, R.N. 1867. Additions by Commd. Brooker, R.N. 1868. Magnetic variation in 1883. Additions to the topography of Formosa from a map compiled by Gen. Chs. W. Le Gendre, U.S. Consul, Amoy & Formosa, 1870. Interestingly, Le Gendre may have used an earlier version of this map in the creation of his 1870 map. See Le Gendre, *Notes on Travel in Formosa*, 77.

⁷⁰ Charles W. Le Gendre, "Amoy," "Island of Formosa: Ports of Takao and Taiwanfoo," and "Formosa." Pp. 49-71, 85-109 in *A report on the commercial relations of the United States and foreign nations, for the year ending September 30, 1869*. Washington: Government Printing Office, 1871. [Executive document No. 18, Executive documents printed by order of the House of Representatives, 41st Congress, Third Session, 1870-71.].

Le Gendre created two drafts of his 1870 map, one dated March 31, 1869 and the other from 1870.⁷¹ The 1869 map had significantly less data than the published 1870 map, though it was still quite informative. The color-coded lines on the 1869 map seem to show both the boundaries between different "Tsee," which were Qing administrative districts in Taiwan and also the boundary between the areas under aborigine chiefs and the areas administered by the Qing.⁷² The 1869 draft map did not include a travel route, but the published 1870 map did. The travel route described on the published map trip was a long trek from Kelung in the north all the way down to the southern tip of Formosa. This journey occupied Le Gendre from about November 1869 through February 1870.⁷³

Le Gendre actively added to his cartographic knowledge during the course of this trip. In his manuscript of this trip, included in *Notes of Travel in Formosa*, he clearly stated that collecting such knowledge was one of the main purposes:

Towards the end of 1869, I determined to examine the Western slope of the mountainous portion of Formosa from Kelung to Takao, and the plain that lies at the foot of it, which may properly be called the Chinese division of the island. My object was to collect specimens of rocks from the hills and the beds of the numerous shallow rivers and creeks that have their sources in the mountains and discharge themselves into the Formosa Strait; to take bearings of the ranges of hills whose positions had not been ascertained; to locate towns of importance which were not yet laid down on the maps; to take photographic views of the country through which we would pass; and to collect such other information as might prove a useful contribution to the historical, geographical and geological knowledge of the island.⁷⁴

Le Gendre's party included a photographic artist, whose duty was "that of obtaining faithful representations...which would serve me for future reference in making maps and

⁷¹ Le Gendre, *Sketch of the Map of Formosa Island*, [1869], see footnote 44 for full citation; Charles W. Le Gendre, *Formosa Island and the Pescadores: China*, 1870, found in Joseph Beale Steere (1842-1940) Papers, 1861-1941, A bibliography of materials concerning his travels to Formosa (Taiwan), 1873-1874, Box 2. The copy of the 1870 draft map that I had access to was in poor condition. I was unable to locate features worth discussing and so I left this map out of my analysis.

⁷² Personal communication with Professor Douglas Fix, 8.30.2007.

⁷³ Personal communication with Professor Douglas Fix, 8.30.07. Also Le Gendre, *Formosa Island and the Pescadores, China*, 1870 notes that Le Gendre crossed the Ponckam river in December, 1869. Le Gendre, *Notes on Travel in Formosa*, 77 mentions that "Towards the end of 1869, I determined to examine the Western slope of the mountainous portion of Formosa from Kelung to Takao..."

⁷⁴ Le Gendre, *Notes on Travel in Formosa*, 77. See also 78. See 84 for another mention of map making. See 44, 87, and 89 for references to Le Gendre's 1870 published map. See also U.S. Department of State, microfilm, no.100 roll 4, for a note on a barometer being used to measure elevation. Located in first third of the dispatch containing the map *Sketch of Formosa Island*.

describing that region.”⁷⁵ One of Le Gendre’s main objectives in taking this trip was to collect cartographic data for his 1870 published map.

He had several methods of collecting data, including timing the marching of his chair-bearers to determine distance, using a compass to lay down his travel route, using a thermometer to determine various altitudes, and having photographs taken for cartographic and strategic purposes. Distances were calculated by measuring the length of the step of his chair-bearers (the bearers had “a very regular step”) and then counting the number of steps taken in a minute.⁷⁶ The Consul could then use this information to obtain a reasonably correct estimate of the distance from one way-station to the next. To increase the accuracy of his map, Le Gendre used several mountain peaks located on Commodore Brooker’s chart to provide reference points against which the Consul could check his own measurements.⁷⁷ Le Gendre used a mercurial thermometer to determine the height of mountains he visited and also more subtle gradations in terrain on the western coast -- perhaps by measuring the boiling point of water at various locations. Unfortunately, after incorporating these readings into his 1870 map, the observation records “were lost with some other memoranda that were burned after the completion of my map of Formosa” -- this prevents us from seeing how those barometric readings were transferred onto the map.⁷⁸ He also carried a barometer “manufactured by J. Spenser, 39 Union Square, Glasjow [sic], carefully placed in a leathern box and carried in my waist-coat pocket so that it would keep the heat of the body and thus be less affected by the temperature of the air.”⁷⁹ The Consul also made use of photographs to record the lay of the land. While visiting a Sabbari settlement in southern Formosa in 1872 Le Gendre’s photographer, “in spite of the rain, took a view of the country South of us. This photograph will prove to be most valuable in case of difficulties with the Aborigines, as it gives three land marks that are visible from the sea, and that could be used as a point of

⁷⁵ Le Gendre, *Notes on Travel in Formosa*, 77.

⁷⁶ Ibid.

⁷⁷ Le Gendre was most likely referring to the British Admiralty chart no. 1968, *Formosa Id. and Strait*. Commander Brooker made additions to this chart in 1868. See footnote 69 for full citation of *Formosa Id. and Strait*.

⁷⁸ Ibid., 78.

⁷⁹ Ibid.

repair for forces operating in the interior.”⁸⁰ Le Gendre would have attempted to determine the exact position from which the photograph was taken but cloudy weather and “other reasons” -- likely a desire not to alarm his aborigine hosts -- prevented Le Gendre from making a more exact determination of his position.⁸¹ Le Gendre was well aware of the potential for future conflict, and part of his preparation was to collect accurate data on the terrain where the conflict would likely take place. As we can see, Le Gendre employed several techniques in his efforts to collect cartographic data on Formosa. For him, cartography was a primary objective, not an incidental side note.

The journey furnished Le Gendre with much new information that he added to his final 1870 map. His travel route was accompanied by multiple points of historical or anthropological interest. However, the additions in data were not localized to the route Le Gendre traveled, though that area was certainly charted in much greater detail. Data was added to both coastal and inland areas, and both the western and eastern areas of the island. Physical features such as mountains and watercourses were laid down more accurately. For example, in the northern area of the island the course of the Nankam River terminating in Tamsui harbor changed significantly from the 1869 representation to the published 1870 representation. In the 1869 version this river was shown as a loop with two termini in the ocean. The Perry expedition's map, *The Island of Formosa*, showed a river named the Namkam River following roughly the same looping course.⁸² However, on his north to south trek the Consul traveled through the area where he should have, in theory, crossed the Nankam river. As it happens, he did not find a river and so he revised his 1870 map accordingly.⁸³ The North Tangow Chain of mountains was also laid down more clearly on the published map. There is a spur reaching from the eastern end of the chain towards the northwest -- on the 1869 draft this spur was only suggested, while on the published map it was clearly defined.

⁸⁰ U.S. Department of State. *Despatches from United States Consuls in Amoy, 1844-1906*. Vol. 6, March 20, 1872 – June 6, 1874. RG 59, National Archives. Washington: 1947. Microfilm, no. 100, roll 6, near beginning of roll and prior to map *Southern Formosa*.

⁸¹ Ibid.

⁸² Hawks, *Narrative of the Expedition*, 1:483.

⁸³ The Nankam river did not even appear on the Le Gendre, *Formosa Island and the Pescadores, China*, 1870. However, the points where the theoretical river entered the sea were retained. They simply belonged to other river systems, some of which may not have been thoroughly explored by a Euroamerican cartographer at that time.

Interestingly, the commercial data did not change much between the 1869 draft and the 1870 publication nor did the locations of the products shift much between the two maps. However, there were a few changes along the route Le Gendre traveled. On both maps rice and sugar were common along the western coast. Camphor was located in the mountainous interior. Tobacco and indigo occasionally appeared alongside the rice and sugar, but they were given secondary status. Tea was noted in the north. Sweet potatoes were absent on the 1869 draft, but on the 1870 published map they were marked in multiple locations between Chang-hua and Taiwanfoo. Coincidentally, all of these newly marked sweet potato locations were near the route traveled by Le Gendre. Perhaps sweet potatoes were less of an export commodity and therefore the Consul was relatively unaware of them until he visited “an immense plain planted with Sweet Potatoes” not far north of Taiwanfoo.⁸⁴

Another change in the commercial data was the treatment of coal in the 1869 draft and 1870 published version. The 1869 map records “Coal Fields” just south of Kelung. On the 1870 map the coal fields are not mentioned. Instead, the space contains a mention of “Rice, Tobacco, Sugar, & Indigo.”⁸⁵ Coal was also noted near Mt. Silvia (also in the north) on the sketch map, but the 1870 map does not mention coal in that location. In fact, all mention of coal seems to have been removed from the 1870 map.

The most likely reason for this removal of coal is that 1870 was a low point in Formosan coal exports.⁸⁶ In his *Notes of Travel in Formosa* Le Gendre wrote,

In 1865, 120,323 peculs of Coal were exported from Kelung to Hong Kong and the treaty ports of China. In 1866, the exportation reached [p.110] 300,305 peculs; but in 1867 it fell to 216,055 peculs, while in the following year, 1868, it increased to 426,599 peculs. In 1869, shipments of coal both to Hong Kong and Shanghai were unusually large. The market became glutted, and the supply for two years remained so much in excess of the demand that the priced [sic] offered hardly paid for the freight. Under these adverse influences all work in the Formosan mines was almost entirely stopped, and the exports, limited to the sale of the stock on hand, fell in 1869 to 247,476.01 peculs, and in 1870 to 126,956.04 peculs. In 1871, with increased prices, it went up again to 313,673.35 peculs.⁸⁷

⁸⁴ Le Gendre, *Formosa Island and the Pescadores, China*, 1870.

⁸⁵ Ibid.

⁸⁶ It is also possible that the removal of coal was not intentional. It could have been a simple mistake.

⁸⁷ Le Gendre, *Notes on Travel in Formosa*, 44. The quote continues to discuss a too-high export duty the Chinese government placed on low quality coal -- according to Le Gendre, this stifled both the market and Chinese tax revenues.

As we can see, coal exports recovered and the resource continued to be of some importance. Its absence in the map reflects a momentary lapse rather than an enduring trend.

Le Gendre's writings on coal in his 1874 manuscript were a testament to the enduring importance of that resource. Le Gendre discussed coal mining at some length in his chapter on Kelung in *Notes of Travel in Formosa*, and, as we have seen, he quoted nearly verbatim Preble's mention of coal on his map *Kelung Harbor*.⁸⁸ Although by 1874 he was working for Japan rather than the United States, his manuscript *Notes of Travel* and the presence and later absence of coal on his island maps showed that he had been paying close attention to this resource during his tenure as Consul.

Conclusions

In the mid-nineteenth century the United States wanted to find coal for refueling their steamships and also shipwrecked American sailors in Formosa. Later, as seen with Le Gendre, the U.S. was interested in a wide variety of commercial data. U.S. interest in coal was shown by Preble and Jones's charts and supported by information in Le Gendre's later reports -- though it could be argued that the resource had lost some of its importance over time. Perry also wanted to locate shipwrecked American (and European or other) sailors. Captain Joel Abbot attempted to do so in 1854 and Le Gendre's 1872 *Southern Formosa* map was produced to explain and illustrate the Consul's extensive travels and diplomatic work in the attempt to secure the safety of future shipwrecked sailors. Fifteen years later Le Gendre was still looking for shipwrecked sailors and keeping tabs on the coalfields in the north. However, by this time U.S. policy had expanded -- his 1870 map showed the additional objective of increasing U.S. commerce with Formosa.

These American cartographers significantly increased their knowledge by visiting the sites they mapped, but their vision was still colored by what they sought. Le Gendre's maps and travels provided a good example of how, in his case, the cartographic knowledge of a region increased significantly after the cartographer visited it. He gained knowledge on his travels, transferred that knowledge to maps, and those maps influenced

⁸⁸ See footnote 27.

and added to the cartographic knowledge of others after him. This can be seen with his redrawing of the Nankam River and the central north-south mountain range. However, as we have seen, the knowledge gained depended on what the cartographer was looking for. Two prime examples were Chaplain Jones's map, which was covered in data on coal, and Le Gendre's map *The Rover Case*, which included a terrific amount of information on the aborigines the Consul had gone in search of.

In addition, the methods used varied according to the cartographer's purpose and some of the maps were in part intended as informative illustrations to explain the action of their makers. Jones made a walking map of coal fields and so did not need to use precise methods. Preble made a map that could have been used for navigating a harbor and so he needed more precise methods. The opportunity for greater precision could easily have motivated Le Gendre's use of scientific instruments. In order to explain his travels to government officers in Washington D.C. Le Gendre needed informative illustrations, i.e. maps. Both he and Perry included travel routes on some of their maps so that people far removed from Formosa and Japan could better understand their actions in East Asia.

My conclusions are of a highly particular nature -- they are specific to a small group of individuals on an island over a mere fifteen year period. However, they relate to several broader categories. First, they add to the body of knowledge regarding the activities of westerners in nineteenth century Formosa. Second, they are a case study in nineteenth century American imperialism in East Asia -- they show what the Americans were interested in and how they went about gathering knowledge relating to those interests. Third, my research helps expand the study of historical cartography into a time and place that has received little attention from that academic field. The cartographers' travels, their methods, and the information they sought on the island of Formosa were a part of the larger drama of American knowledge collection and imperialism playing out in nineteenth century East Asia.