

5 Naval Technology and the Geopolitics of the Kuroshio Highway

Direct trade from our western coast with Asia became ... 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. Where was it to be obtained on the long route from California to Asia?

From the report of Commodore M. C. Perry's missions to Japan, 1856

The American coolie ship *Robert Bowne* had been on her way from Amoy to California or Peru for ten days when the 410 Chinese laborers on board mutinied on March 30, 1852. Abusing the coolies and throwing several of them overboard, the crew had stirred a violent uprising that killed the captain, two officers, and four sailors, and left five of the coolies dead in battle.¹ The mutineers took possession of the vessel and ordered the remaining crew to navigate until they met with land five days later at Ishigaki, a western outpost of the Japanese vassal kingdom of Ryukyu.² Most coolies had disembarked by the time the remaining crew members regained control of the vessel and steered back to China. Back in Amoy, the crew reported the incident and demanded prosecution of the mutineers. US consul Charles W. Bradley requested the support of the British brigs *Lily* and *Contest*, which readily steered to Ishigaki to prosecute the fugitive coolies.³ While transpacific coolie trade was developing quickly in the hands of American shipowners, the British were still the chief human traffickers out of China at that time, and were therefore interested in ready assertion of Western business

¹ Ng, "The Amoy Riots of 1852," 2017, 319.

² Nishizato, "(Kantō ronkō) Robert Bowne jiken saikō," 1995, 10.

³ *United States Diplomatic and Public Papers* vol. 17, doc. No. 85, 87, 97, pp. 238–39, 240–41, 261–62, ed. in: Davids ed., *American Diplomatic and Public Papers, the United States and China: Series 2, the United States, China, and Imperial Rivalries, 1861–1893*, 1979. Also see: Nishizato, "(Kantō ronkō) Robert Bowne jiken saikō," 1995, 18–21.

interests vis-à-vis the Qing state.⁴ After a raid by hundreds of armed soldiers at Ishigaki, the British delivered seventeen captives to the Chinese authorities for trial, while several hundred coolies continued to hide out in the hills. Quickly, a conflict between Qing China, to whose territory Ishigaki was mistakenly counted, and the United States that claimed jurisdiction on the “high seas,” developed into a multilateral confrontation that sprawled to the court of the Ryukyuan king and his Japanese overlords in Kagoshima.⁵

The ambiguous status of Ryukyu put the kingdom at the forefront of a decades-long geopolitical transformation that would culminate in the political “opening” of Japan. Since the invasion by Satsuma domain in 1609, the island kingdom figured as a Japanese puppet state and diplomatic proxy for trade and communication with China, but Western navies primarily perceived the islands’ tributary relationship with the Qing as an extension of continental power. Japan, after all, was thought to be hermetic. Even under Satsuma rule, Ryukyu practiced largely independent maritime policies, as the coming and going of foreign vessels at Naha and the frequent landing of whalers in more remote islands over the 1830 and 40s illustrate.⁶ Increasingly dense traffic along the Kuroshio route across Ryukyu and along Japan’s southern shores increased the potential for maritime conflict. International traffic and the state violence it drew after itself involved Japan’s maritime periphery into conflicts over repatriation, prosecution, and questions of maritime jurisdiction.⁷ It is in these inconspicuous locations along the Kuroshio highway, islands like Ishigaki, Aguni, and Iheya, that the story of Japan’s political “opening” should really begin.

The smoking stacks of Commodore M. C. Perry’s black ships at Uraga in the summer of 1853 doubtlessly triggered turmoil among Japanese commoners and leaders, but it did not come unexpectedly, as the commodore’s visit stood in a series of Western naval approaches.

⁴ According to Ng’s calculations, 73 percent of all coolies ferried out of China until 1852 were “traded” under the British flag. Ng, “The Amoy Riots of 1852,” 2017, 316.

⁵ *United States Diplomatic and Public Papers*, vol. 17, doc. No. 129, pp. 312–14, ed. in: Davids, *American Diplomatic and Public Papers, the United States and China: Series 2, the United States, China, and Imperial Rivalries, 1861–1893*, 1979. Also see: Nishizato, “(Kantō ronkō) Robert Bowne jiken saikō,” 1995, 21.

⁶ The *Morrison*, for example, convened at Naha with the *Raleigh* in 1837, five years before the *Shell-Repel* edict had been rescinded. By the time of Perry’s visit, a British missionary, Mr. Bettelheim, had been flying the Union Jack for five or six years at his Naha home. Perry, *Narrative of the Expedition*, 1856, 152.

⁷ On the impact of such incidents on Japanese legal practice, see Botsman, “Freedom without Slavery?,” 2011, 1331.

“Perry’s arrival came as a shock,” writes David Howell, “but it was the shock of an earthquake to people living on a fault.”⁸ Not only had the scenario of naval incursions on the very capital materialized four times already since 1837, the shogunate had been improving the defense of the capital systematically since 1845. James Biddle’s USS *Columbus* and *Vincennes*, which entered Edo Bay in 1846 weighed down by over one hundred cannons, had particularly alerted the authorities.⁹ Of course, Perry’s stopover at Naha en route to Edo was readily communicated to the shogunal capital by a Satsuma speed missive. The notification that the American squadron was taking course on Edo by way of the Bonin Islands reached the senior council in Edo on May 26, 1853, at over a month’s notice from Perry’s arrival.¹⁰

This chapter reevaluates the geography and timeline of the so-called “opening” of Japan from a maritime perspective. Over the 1850s, the offshore was transformed from a topography of illicit mingling between fisherfolk and foreign whalers described in Chapter 4 into an infrastructure of state-led and steam-powered naval access along the eastbound Kuroshio route. Technological change originating in distant countries occupies a prominent role in this process, yet even as steam came to power navigation, currents, and winds continued to shape time and place of naval engagement. In the aftermath of the California Gold Rush of 1848, thousands of laborers or “coolies” were ferried yearly from Chinese treaty ports to construction sites and mines in the Americas, along the Japanese coasts. The expansion of transpacific traffic and the emergence of steam-powered navigation directed new naval interests to the region, centered on the construction of coaling infrastructure and the expansion of extraterritorial jurisdiction. Granting protection to stranded whalers was a credible legitimization for American interest in Japan, but the desire to source coal from the region for the creation of transpacific steam routes, which the US Congress had been planning since 1848, was of greater political interest.¹¹ With Perry’s

⁸ Howell, “Foreign Encounters and Informal Diplomacy in Early Modern Japan,” 2014, 297.

⁹ Wilson, *Defensive Positions*, 2015, 135, 138–39. Biddle’s ships’ firepower was estimated to exceed the firepower of the harbor batteries by nine to one, considering weight of projectile and number of canons. Other naval incursions to Edo bay occurred in 1837 (*Morrison*), 1845 (*Manhattan*), 1846 (*Columbus*), and 1849 (*HMS Mariner*).

¹⁰ This corresponds to the nineteenth day of the fourth month in the Japanese year *Kaei* 6. *Shiryō kōbon*, *Kaei 6 nen shōgatsu kara gogatsu made*, pp. 159–61, in: HEN, Kinsei Hennen Database.

¹¹ *Letter to the Emperor of Japan*, in: Perry, *Narrative of the Expedition 1856*, 256–57; Shulman, *Coal and Empire*, 2015, 79.

encouragement, American businessmen in China amplified their calls on US government to also appropriate Taiwan and its coal deposits “in the interest of humanity and commerce,” or to purchase it for ten million dollars, a demand, however, that ebbed off with the opening of Taiwanese harbors in 1860.¹² Though the Japanese could fend off whalers letting them restock water and foodstuff in peripheral islands once the infamous Shell-Repel edict had been revoked in 1842, the steam-powered navies that followed in their wake were determined to seize access to naval infrastructure on shore.

These developments were observed with consternation in the maritime capital of Edo. While defense reforms over the preceding years had focused on improving harbor fortifications, shogunal advisers warned that the city’s maritime supply routes – traveled by around 7,500 vessels yearly – remained poorly protected against naval attacks.¹³ In the following, we will see how this plight prompted organizational and strategic reforms of a fragmented defense system. Shogunal and domain leaders sought to reclaim control of its offshore space by building essential naval capacities. The subsequent appropriation and reverse engineering of foreign technologies unfolded as a domestic race between domain navies that brought about makeshift steamboats and a series of knockoff schooners, pirated from Russian plans. Even though the shogunate’s efforts to build a national naval power failed eventually, Japan’s strategic reorientation of the 1850s was a dynamic process, powered by decentralized actors – in which the arrival of American black ships was just another episode.

Hydrography of the Kuroshio Highway

Despite the emergence of steam-powered navigation, the routes of transpacific traffic at mid-century remained structured by winds and currents. The opening of Chinese treaty ports, codified for Americans in 1844, and the American annexation of California in 1848 put Japan in the middle of a transpacific highway. In the mid nineteenth century, both sailing vessels and steamboats plying the Pacific had to choose their routes in consideration of winds and currents. With lieutenant

¹² Davids, *American Diplomatic and Public Papers, the United States and China: Series 2, the United States, China, and Imperial Rivalries, 1861–1893*, 1979, xix.

¹³ Louis Cullen’s extensive surveys of coastal trade statistics indicate a slight increase in number of vessels from 7,424 in 1726 to 7,741 in 1871. Cullen further estimates that at least 3,000 of these vessels annually were carrying rice into the city of Edo. (Cullen, “Statistics of Tokugawa Coastal Trade and Bakumatsu and Early Meiji Foreign Trade,” 2009, 187.)

Matthew F. Maury's compilation of whalers' observations of the oceans' movements into comprehensive charts of the Pacific, by mid-century, sailors were navigating an intricate maritime topography of currents and winds.¹⁴ Ships traveling west by way of the Marquesas or Hawai'i took advantage of the propulsion by easterly trade winds and the westbound north or south equatorial currents, whereas the eastbound journey from Asia to the Americas had to avoid these equatorial phenomena. As Alexander Keith Johnston's *Physical Atlas* of 1850 tells, coolie ships bound for Chile and Peru could choose to cross the South China Sea, pass the Sunda Strait and sail into the circumpolar current South of Australia to reach South America.¹⁵ More direct, however, was the Japan route. "On the voyage from India to South America," Johnston wrote, "which is generally made during the south-west monsoon, ships keep to the north of the limits of the north-east trade-wind, which is usually met with only in latitude 28° and 29° north"¹⁶ – across the Tokara Strait between Satsuma and Ryukyu. The trading and coolie ships that connected Canton and Shanghai to the Americas then followed a route just a few degrees south of the Japanese coasts.

Maritime drift was a significant factor for navigation at mid-century, with or without steam propulsion. Johnston's map of the Pacific shows the Kuroshio as a maritime highway for eastbound voyages, whereas westward sailing went by way of the North Equatorial Circulation. From Canton to Port Jackson (near Sydney), the route followed the Kuroshio as far as 175° eastern longitude, to turn sharp south to Fiji, minimizing deflection by easterly winds and currents in tropical latitudes (see Figure 5.1). Though sailing upwind was possible to a certain degree, opposed currents could significantly delay a voyage. Speeds of up to 250 cm/s are observed in some stretches of the Kuroshio, and speeds of up to 100 cm/s prevail in the North Equatorial Current.¹⁷ Oceanographer Silas Bent reported that in 1848, "bound from Hong Kong to Japan, we struggled for three days, after leaving port against this south-westerly current, without making a single mile on our course to the eastward."¹⁸ Conversely, taking advantage of maritime currents could significantly accelerate navigation. In fact, it had been observed that Chinese sailors avoided struggling with southward currents in

¹⁴ On Maury's *Whale Chart of the World* and related publications, see Chapter 3.

¹⁵ Meagher, *The Coolie Trade*, 2008, 150.

¹⁶ Johnston, *The Physical Atlas, a Series of Maps & Illustrations of the Geographical Distribution of Natural Phenomena*, 1850, 40.

¹⁷ Talley et al., *Descriptive Physical Oceanography*, 2011, 308, 342.

¹⁸ Bent, *A Paper on the Kuro-Siwo*, 1856b, 4.



Figure 5.1 Revised edition of Johnston's map of the Pacific Ocean and its maritime currents of 1855 (detail). Note the markup for equatorial westbound routes (solid lines) and eastbound routes (dotted lines) following the northerly path of the Kuroshio or "Japan Current." (*Physical Chart of the Pacific Ocean*, in: UC Berkeley, David Rumsey Map Collection, David Rumsey Map Center, Stanford Libraries. Acc. No.: 0372.015.)

the Formosa strait and sometimes took a detour east of Formosa and sailed north in the Kuroshio.¹⁹ In 1874, American diplomat Charles LeGendre's map of Taiwan recommended the route to Japan along the Kuroshio east of the island, noting that the current there flows at "20 to 40 miles per day."²⁰ As transpacific traffic volumes grew in the mid nineteenth century, eastward travelers plying the fluid topography of the East Asian seas were likely to choose the path of the Kuroshio and travel across the Ryūkyūs and along the coasts of "secluded" Japan.

¹⁹ Perry, *Narrative of the Expedition*, 1856, 428.

²⁰ *Formosa Island and the Pescadores*, in: LOC.

The Law of the Stronger on the High Seas

It had happened more frequently over the previous decade that foreign sailors landed in Ryukyu and Japan distressed or in pursuit of trade, but the violence demonstrated in the aftermath of the *Robert Bowne* mutiny of 1852 evidenced a new, frightening escalation at the hands of British and American navies. Shimazu Nariakira, the ruler of Satsuma domain and overlord of Ryukyu, informed the shogunate that the incident in Ishigaki was by no means the first intrusion, but that the Ryūkyūs were approached at least three times over the preceding half a year – as far as reported – by foreigners who “appeared exhausted and were therefore given porridge and hard vegetables.”²¹ Logbooks of whaling vessels suggest that, since the abrogation of the *Shell-Repel* edict in 1842, informal landings in the Ryūkyūs happened frequently and deliberately with the intention to restock on foodstuff. With the *Robert Bowne* incident, however, it became clear that such peaceful encounters were but the harbingers of much cruder imperial interests in the high seas.

Shimazu’s speed missive to the shogunate reported that the 405 Chinese aboard the vessel had left their homes in Fujian province due to a drought and intended to “move to England and make a living there.” During the voyage, they explained, they met bad winds and drifted to Ishigaki.²² The coolies at first disguised their true predicament in front of the local authorities, causing a great surprise when the British gunboat *Lily* approached some three weeks later, opening fire on the refugee camps the local administrators had set up for the castaways. The situation escalated when about 200 armed soldiers disembarked:

In turmoil, the Chinese fled into the mountains, but three were shot dead and fourteen begged for mercy. Two who had [hoped to] board a ship ran into the mountains and ended their lives hanging themselves ... As we inquired, the Englishmen who came to the island [said they] had invited the Chinese to sail from Amoy to a place called “Gold Mountain” [San Francisco], but during the voyage, the Chinese lost control of their impulses and killed the captain and five of the crew at sea.²³

With the support of HMS *Contest*, which joined the site two days later, the raids lasted a week and killed at least forty coolies but resulted in the arrest of a mere five, the others having fled into the “jungle.”²⁴ Ten days after the British had given up the chase, on May 22nd, the East India

²¹ *Shiryō kōbon, Kaei 5 nen shōgatsu kara shigatsu made*, pp. 200–01, in: HEN, Kinsei Hennen Database.

²² *Ibid.*, 106–08.

²³ *Ibid.*

²⁴ Nishizato, “(Kantō ronkō) Robert Bowne jiken saikō,” 1995, 21.

Squadron's sloop-of-war USS *Saratoga* appeared off Ishigaki and landed approximately 100 men. By the end of the month, they had captured between fifty and sixty coolies with which they sailed back to Amoy.²⁵

The presence of these prosecuted individuals had turned into a hazard. Shimazu had immediately forwarded the Ryukyuan request that the coolies be brought away as soon as possible to avoid renewed incursions, but one year after the incident, district magistrate Miyara Tōsō of Ishigaki reported that 270 Chinese refugees still burdened the local population. Miyara asked that they be returned to China at the expense of the Ryukyuan king.²⁶ One Chinese official in Fujian later remarked that "as the tyranny of the English barbarians was extraordinary, the prince of the said country [Ryukyu] greatly feared that if they were not delivered up immediately, the barbarian ships would return, make an exhaustive search, and give rise to trouble."²⁷ But by that time, the islands of Ryukyu had already become entangled tightly with the competition of imperial interests of Western and Asian powers over jurisdiction on the high seas.

Ignorant about Ryukyu's political status, the American Envoy in Canton, Peter Parker, insisted that "had the piracy been committed within the jurisdiction of China, the 21st article of the treaty would consign the pirates to the government of China, but occurring upon the high seas and under the flag of the United States, strictly speaking, it comes under the exclusive cognizance of the laws of the United States."²⁸ Yet since US authorities tried to keep their protection of human traffickers discrete and expected harsher punishment according to Chinese practice, Parker extradited the captive coolies to a Qing court. The coolie trade, resembling the practices of Atlantic slave trade in many regards, had come under sharp criticism in China and the West. The conditions aboard were so abusive that four out of seven coolie voyages to the Americas in 1850 encountered incidents of mutiny, while others suffered passenger mortality rates around one-third – in one documented case even two-thirds – by the time the ships reached their destinations.²⁹

²⁵ Ibid., 25–26.

²⁶ *Shomenshū*, pp. 4, 8, in: RYU, Miyara Dunchi Collection.

²⁷ Memorial by Yu-feng, provisional governor of Min-Che, in: *United States Diplomatic and Public Papers*, vol. 17, doc. 143, pp. 340–432, ed. in: Davids, *American Diplomatic and Public Papers, the United States and China: Series 2, the United States, China, and Imperial Rivalries, 1861–1893*, 1979.

²⁸ Consul Peter Parker to Secretary of State Daniel Webster, in: *United States Diplomatic and Public Papers*, vol. 17, doc. 107, pp. 277–78; doc. 143, 340–42, in: Davids, *American Diplomatic and Public Papers, the United States and China: Series 2, the United States, China, and Imperial Rivalries, 1861–1893*, 1979.

²⁹ Ng, "The Amoy Riots of 1852," 2017, 319; Meagher, *The Coolie Trade*, 2008, 140, 149. These coolies were given labor contracts that often entailed release or even repatriation after fulfilment of a stint. In practice, however, coolie traders abusively lured Chinese

The Qing court, however, acquitted the mutineers and started an investigation instead against those who swindled the coolies into coming aboard in the first place.³⁰ The subsequent diplomatic showdown between the two empires exposed systematic abuse on the part of coolie traders and triggered the outbreak of violent riots in Amoy in the fall of 1852 that, however, did little harm to the bustling business of human trafficking along the Kuroshio route.³¹

In Europe, early modern legal debates had brought about ideas of the seas as a space without rulers other than the “natural law,” but as Lauren Benton has shown, both policing and mapping of maritime space were centered on “a thickening network of imagined corridors [that] produced distinctive regional regulatory spheres.”³² Land-borne polities exerted significant influence on the creation of these maritime spheres by creating a balance of blackmail that expanded their legal influence over the ocean. As Adam Clulow finds, the Tokugawa shogunate fared well, too, by pressuring the Dutch VOC into complying and even performing services amidst an intentionally vague maritime jurisdiction, “without the vast expenditure and technological challenges involved in maintaining a fleet.”³³ By the early nineteenth century, maritime jurisdiction was perceived in Europe according to the principle that “territorial rule ends where the power of weapons ends”³⁴ – a distance that has been recognized to count for about three miles from the shore. While no correspondence was held with

men into exploitative labor contracts. Arnold Meagher calculates that of 138,156 coolie laborers shipped to Cuba between 1847 and 1873, 11.8 percent died at sea. Edward Melillo, studying the trafficking of 100,000 coolies to guano mines in Peru, has shown how the British encouragement for contract-based coolie exploitation was initially propagated as a statement of abolitionism, as the empire had banned slave trade in 1807 already. Melillo, “The First Green Revolution,” 2012, 1038.

³⁰ This matter caused much frustration among US representatives. *United States Diplomatic and Public Papers*, vol. 17, docs. 129, 130, 134, etc., ed. in: Davids, *American Diplomatic and Public Papers, the United States and China: Series 2, the United States, China, and Imperial Rivalries, 1861–1893*, 1979. In Feb. 1862, the US Congress banned Americans and the US flag from involvement with coolie trade to South America, though changing little more than the harbor enrollment of American coolie ships. Meagher, *The Coolie Trade*, 2008, 146–47. In the 1840s and 1850s, the practice of human trafficking, illegal under Qing law, was connived by both British and Chinese authorities. Ng, “The Amoy Riots of 1852: Coolie Emigration and Sino-British Relations,” 2017, 316.

³¹ A detailed account of the abuse endured by the coolies is given in a *Letter from Qing official Seu Kwang Tsin to Peter Parker*, in: *United States Diplomatic and Public Papers*, vol. 17, doc. 129, 312–14, ed. in: Davids, *American Diplomatic and Public Papers, the United States and China: Series 2, the United States, China, and Imperial Rivalries, 1861–1893*, 1979.

³² Benton, *A Search for Sovereignty*, 2009, 34.

³³ Clulow, *The Company and the Shogun*, 2014, 137, 168.

³⁴ Wheaton, *Elements of International Law*, 1836, 216.

Ryukyuan officials regarding American claims to the jurisdiction of the “high seas,” which US Consul Peter Parker had cited so insistently vis-à-vis Qing officials, the *Robert Bowne* incident abruptly showed that conflicts between third parties offshore could end with violent action on Ryukyuan or Japanese territory.

Abe Masahiro and the Defense Patchwork

By the time they learned about the *Robert Bowne* incident, the shogunal authorities had spent years expediting projects to improve maritime defenses. Since the appointment of twenty-six-year old Abe Masahiro to the supreme position of Chief Senior Councilor in 1845 and his assumption of the self-instituted position of Coastal Defense Officer, naval preparedness had entered top executive levels.³⁵ In particular, Abe was bracing for advances on Edo Bay. As Noell Wilson writes, the Senior Councilor “was crafting Uruga as an indispensable defensive and diplomatic portal – adding a fifth ‘*guchi*’ to Arano’s four-site rubric (of Matsumae, Tsushima, Nagasaki, and the Ryūkyūs) – a new ‘gateway’ on par with that of Nagasaki.”³⁶ Since 1843, the Uruga magistrate permanently had a Dutch translator at his disposition, and in 1849, Abe granted the magistrate the authority to negotiate with foreign vessels in order to effectuate a timely departure. Under Abe, naval preparations around the capital gained further urgency when James Biddle’s USS *Columbus* attempted to enter Edo Bay in 1846.³⁷ In response to additional attempted landings in the Gotō islands, Ezo, and the northeast, Abe asked Saga domain to build a series of Western-style *batteira* vessels, robust enough to transport a howitzer, a project the domain had begun to prepare in 1840 already – in the course even attempting to build a three-masted sloop.³⁸

For financial and legal reasons, the strategy continued to center on the defense of strategic harbors from shore-borne batteries. As the shogunal archivist Shibukawa Rokuzō argued:

even if we study the barbaric ways in a haste, it will be impossible to meet [their] level. Rather than trying to counter intelligent and well-trained barbaric crews with ill-prepared mariners, perfecting the ways studied in our country of old is by far a better strategy. In foreign countries, they build schools for artillery and navigation, select soldiers and conduct research; day by day they invent new strange skills, changing their methods year by year. While we are making efforts

³⁵ *Kokushi daijiten*, keyword Abe Masahiro. Abe was named Senior Councilor (*rōjū*) at the age of twenty-five in 1843.

³⁶ Wilson, *Defensive Positions*, 2015, 137–38.

³⁷ Wilson, *Defensive Positions*, 2015, 135.

³⁸ Adachi, *I’yō no fune*, 1995, 221–38.

to imitate them in our country, those countries adopt methods that surpass [ours] already. No need to even discuss feasibility and purpose of such endeavors, it is nothing else than a great waste of money.³⁹

Rather than chasing after the foreign ways, Shibukawa believed, Japan should perfect original and age-proven strategies, centered on harbor defense.

However, advisers in the entourage of shogunal intendant Egawa Tarōzaemon raised criticism of this harbor-centric approach to naval defense. As discussed in Chapter 4, Egawa's advisers Chōei and Kazan had stepped up their polemic by cautioning about invasion scenarios in the aftermath of the *Morrison* incident of 1837, and also Egawa himself urged the creation of seaborne means of defense. In early 1839, he was assigned to assist City Magistrate Torii Yōzō in surveying Edo Bay, despite Torii's lower rank. Yōzō had a reportedly difficult character, and it is believed that a clash between the men eventually led to the purge of Egawa's advisers.⁴⁰ Yet the two had to continue their collaboration until Yōzō's fall from power in 1844.

News of the Opium War, which had ended in 1842 with a shattering defeat for the Qing empire, informed the scenarios of naval war Japanese leaders reckoned with. In a decisive move, the British had deployed five steamboats and eleven sailing vessels up the Yangzi river and blocked the Grand Canal that connected China's southern granaries to the northern capital.⁴¹ Vernacular accounts circulated how the British "first seized strategic positions from the Qing and with those as a foothold, used the power of wind and currents over thousands of miles of coasts to rob in the morning and menace at night; or they stole rice and grain from the cargo vessels at sea *en route* to Beijing, in order to exhaust the soldiers of that country."⁴² Such narratives were received with fear and fascination among the Japanese public. One graphic novel titled *Kaigai Shinwa*, or "News from Overseas," which originally circulated in a small run of only about fifty copies, within a few months drew book-length responses from commoners debating about naval defense. Since the novel spread concerns about Japan's naval preparedness, it circulated for just a few months before censorship struck down on the author Mineta Fūkō and his publisher. But soon, an unknown group of activists reprinted his novelistic warnings in a much greater run.⁴³ Though Fūkō was imprisoned

³⁹ Shibukawa Rokuzō, cited in Tanaka, "*Bansha no goku*" *no subete*, 2011, 78.

⁴⁰ Tanaka, "*Bansha no goku*" *no subete*, 2011, 192.

⁴¹ Headrick, *Power over Peoples*, 2012, 204.

⁴² *Kaigai Shinwa*, vol. 2, 12, in: WUL.

⁴³ Okuda, "Mineta Fūkō 'Kaigai Shinwa' no ichibu no shōkai," 2008, 214.

and later banished from Edo, his narrative of the British naval onslaught continued to circulate and was cited by prominent intellectuals such as Sakuma Shōzan and his student Yoshida Shōin, as Bob Tadashi Wakabayashi has found.⁴⁴

Perhaps Egawa Tarōzaemon had studied the outcome of naval warfare in China based on similar accounts. The intendant pointed out repeatedly that while overall military preparedness was high, the scenario of an attack on the maritime supply routes to Edo posed a major risk. In a report to the shogunate probably dating to that period, Egawa wrote:

Should the foreigners realize that they can strangle Edo and suddenly mobilize a great number of gunboats, they could easily come ashore and thoroughly explore the land and geography, since our [coastal] defenses are not prepared ... we are afraid, this would turn into a terrible debacle. If, again, we allowed them to get hold of Ōshima or the eight other islands, and they install cannons on its mountain slopes, it would be impossible for our weak Japanese ships to approach them, and the maritime path to Edo would be severed.... As long as we don't have any gunboats, we may find ourselves in plight. Normal Japanese boats will not suffice as gunboats, even the large ones. If they cannot be constructed solidly enough, they cannot become the wings of our defense positions.⁴⁵

Unlike earlier defense strategies for Edo Bay, inspired at Nagasaki's harbor defenses, Egawa's assessment emphasized the importance of ship-borne defense of maritime supply routes. The power of steam engines was immediately recognized as a key component of naval modernization, but opponents cited fears that large gunboats would be mistaken as invaders and cause turmoil. But whatever the appearance, constructing solid hulls and designing versatile rigging seemed essential to patrolling the maritime highway.

The Toukugawa security architecture, which descended from a quasi-feudal regime set up at Ieyasu's time, was a highly cost-effective system in which military services and infrastructure duties were performed in the manner of *corvée* labor. Programs to step up military preparedness along the shores put pressure on the local domain's finances, as one assistant remarked: "[W]e must not allow that the coastal domains become exhausted and their livelihood cut off."⁴⁶ But under the given circumstances, creating a more centralized defense system with straight command lines into the domains was a daunting task. The new naval challenges in fact led to a situation in which the domains performed defense

⁴⁴ Wakabayashi, "Opium, Expulsion, Sovereignty," 1992, 4.

⁴⁵ *Izu no kuni go-biba no gi ni tsuki zanjyōse mōshiagesōrō kakitsuki*, p. 3, in: EGAN.

⁴⁶ Cited in Tanaka, "*Bansha no goku*" *no subete*, 2011, 77.

duties at the order of the Tokugawa for payment, as Noell Wilson has shown, a fact that further eroded the shogunate's authority when foreign pressure mounted in the 1850s and 1860s. This gradually undermined shogunal finances and authority in a manner that would ultimately hamper attempts to centralize military power and weaken the regime fatally.⁴⁷

Chief Senior Councilor Abe Masahiro chose a strategy of incorporation and cohesion that would remain his signature. The involvement of remote and traditionally less-trusted *tozama* daimyo such as Nabeshima Naomasa of Saga domain into the new defense exigencies granted access to technological achievements financed by the domains, but the act also caused concerns about a loss of authority for the shogunate.⁴⁸ In fact, as Wilson shows, a shift of military power toward the domains had been ongoing since the shogunate had begun paying for domainal defense services in Ezo.⁴⁹ Productive collaboration with certain key domains did not change the fact that the political entities of Japan were acting independently and in competition with each other. The ascent of Saga domain's Nabeshima Naomasa into a key position for naval defense, for example, granted access to his domain's technological achievements, such as high-quality cannons forged for Edo batteries at his reverberatory furnaces in 1855, or the steam power technology developed by Tanaka Hisashige in the same year.⁵⁰

Other domains, meanwhile, understood themselves as competing against the shogunate and among each other. Shimazu Nariakira of Satsuma domain had given the order to translate Gideon Jan Verdam's *Volledige verhandeling over de stoomwerktuigen*, a Dutch work dating to 1837 that represented the state of the art of steam engine technology at its time. Completed in 1849, Mitsukuri Genpo's translation provided the blueprint for the reverse engineering of a steam engine at the Satsuma domain residence in Edo. The engine was installed on a solid hull designed by Manjirō in 1855. After four years of trial and error, Japan's first steamboat reached merely two to three rather than the planned twelve horse powers but the prototypical success is astounding regardless.⁵¹ Most tellingly, with Satsuma and Chōshū, the most fierce competitors over defense technologies were those domains that would ultimately confront the shogunate and claim leadership in the construction of a

⁴⁷ Wilson, *Defensive Positions*, 2015, 6, 213–14.

⁴⁸ Ibid., 136. Later, in 1853, Abe first invited select representatives of politics and academia to state opinions on political choices and institutional reforms to be addressed, inadvertently opening the sluices for public criticism of shogunal policy.

⁴⁹ Wilson, *Defensive Positions*, 2015, 15.

⁵⁰ Morris-Suzuki, *The Technological Transformation of Japan*, 1994, 58.

⁵¹ Motozuna, *Bakumagatsu jōkisen monogatari*, 2004, 189–90.

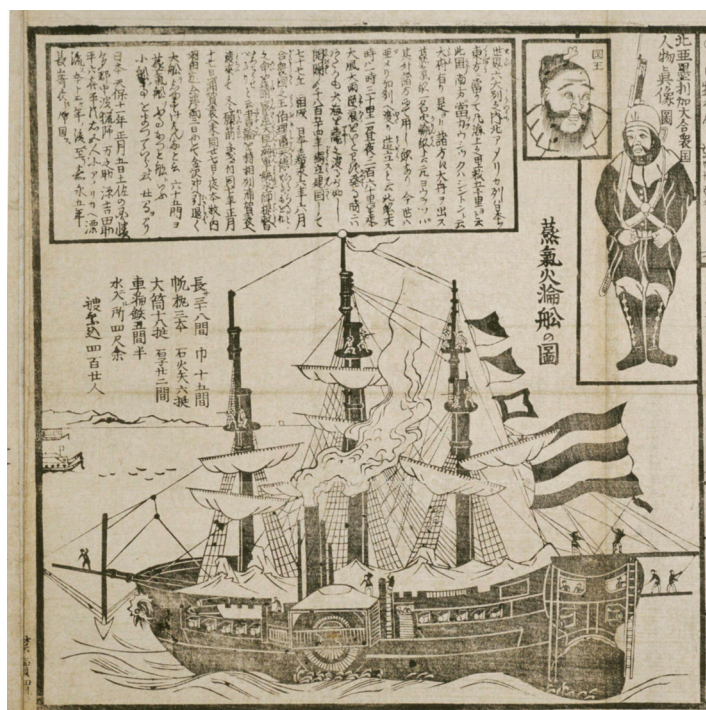


Figure 5.2 Popular representation of a steamboat (ca. 1854). The text reads: “The steamboat, also known as ‘fire wheel boat’ is a vessel originally used in Europe and other regions, but in our age, it is told, [the technology] has spread to America, where they are being built [as well]. As they run, these vessels cover thirty *ri* [118 km] per hour, that makes three hundred sixty *ri* [1416 km] in one day and a night, regardless of wind, rain, and opposed waves. Once they depart, they ply the oceans like dragons!” *Jōki karin sen no zu*, in: NDL, Acc. No. gai-ni-92.

new political order after 1868. By the time of the perplexing approach of Perry’s four large steamboats to the harbor of Uraga in 1853, steam engines were by no means unknown in Japan, but it was not granted that imitating the appallingly expensive technology would be the most effective way to enhance naval strength (see Figure 5.2).

The Geopolitics of Steam Navigation

Perry’s squadron eventually arrived at the entrance of Edo Bay on July 8, 1853, breaking it to the general public that Japan was at the center of a geopolitical transformation that would bring about major change.

Perry approached the harbor of Uraga from the southeast under steam to make it appear as though his fleet had crossed the entire Pacific straight from California, a stretch, he claimed, American steamships could cover in merely eighteen days.⁵² Of course, the shogunate was informed about his true route across the Atlantic and around Africa, along a chain of British coaling stations that led to East Asia through the strait of Melaka.⁵³ As Perry wrote in his report, his fleet burned between twenty-six and thirty-six tons daily, at an approximate cost of \$800 *per ship*, necessitating it for the fleet to travel by wind whenever traveling out of view from major harbors.⁵⁴ The very fact that Britain was in control of coaling stations all along the eastward routes from the Atlantic to East Asia underlines the significance of Perry's mission. The coaling stations Perry intended to install for American navigation would facilitate steam-powered access to Asia by way of the North Pacific.

Steam-powered shipping had emerged in the 1810s chiefly to propel river shipping, but by the 1820s, steam technologies were used along some coastal routes at sea. The technology brought about major changes to infrastructural requirements for both riverine and maritime shipping.⁵⁵ In the Pacific, steam navigation had first become commercialized with the founding of the British-financed Pacific Steam Navigation Company (PSNC) that started operating a steam-powered mail line along the Chilean coast around 1840.⁵⁶ Though costly and financially risky, such enterprises served a strategic purpose as they facilitated transport and communication according to a regular, environmentally independent schedule, particularly in regions dominated by seasonal wind patterns or strong currents, such as in the Humboldt Current off western South America. Alexander Keith Johnston, author of *The Physical Atlas* cited in Figure 5.1, having traveled on the PSNC line at some point in the 1840s, reported that the trip from Guayaquil to Lima against the current, which on average took twenty-five days, could now be traveled in a mere five days.⁵⁷ The benefit of sailing according to exacting schedules in defiance of seasonal winds and weather only outweighed the cost of coal on certain stretches. Steamboats provided a particular military advantage on rivers. In China, British and American steamboats began operating

⁵² *Letter to the Emperor of Japan*, in Perry, *Narrative of the Expedition*, 1856, 256–57.

⁵³ Shulman, *Coal and Empire*, 2015, 84–85.

⁵⁴ *Ibid.*, 86.

⁵⁵ Headrick, *Power over Peoples*, 2012, 181–91.

⁵⁶ Smith, *Coal, Steam and Ships*, 2018a, 213–18.

⁵⁷ Johnston, *The Physical Atlas, a Series of Maps & Illustrations of the Geographical Distribution of Natural Phenomena*, 1850, 40.

coastal steamer lines in the mid-1840s, but commercial oceangoing voyages remained chiefly wind-powered for decades thereafter.⁵⁸ It was not until 1871 that the British navy commissioned their first mastless and exclusively steam-powered warship, and until the close of the century, developing an empire-wide network of coaling stations remained an essential security task for the British navy.⁵⁹ Steamboats remained closely tied to this coastal infrastructure, a factor that sharply reduced their scope of operation.

Steam-powered access to East Asia was chiefly a race between Britain and the United States. The British Peninsular and Oriental Steam Navigation Company extended its regular route network from London as far as Hong Kong in 1845, and to Shanghai in 1850.⁶⁰ From their inception, American plans for transpacific steam routes stood in the sign of out-speeding the routes controlled by Britain.⁶¹ Accordingly, projects to establish steam-powered routes across the Pacific had been in discussion in the US Congress since 1848. Based on reports of abundant coal deposits of high quality in Japan, Perry had high expectations for the coal he could stock at Japanese ports.⁶²

The fierce competition between the British and American navies also evolved around the exploration of local coal resources. Since the late 1830s, Borneo had been at the focus of coal exploration for both empires, but by the 1840s, the scope of the race had broadened.⁶³ The discovery of “heavy, brilliant” coal, “easily ignited & burning with a bituminous gassy flame”⁶⁴ by a naval expedition to northern Taiwan shifted the quest for fossil fuels north. Subsequently, Gideon Nye, a businessman and later US Consul in Macao, feared that the island’s coal resources may motivate a British occupation, so he urged the United States in 1857 to appropriate or purchase the island from Qing China.⁶⁵ This suggestion remained unanswered, however, as the focus of coal exploration in East Asia was shifting to Japan.

⁵⁸ Headrick, *Power over Peoples*, 2012, 182–88; Meagher, *The Coolie Trade*, 2008, 149.

⁵⁹ Gray, *Steam Power and Sea Power*, 2018, 1–10.

⁶⁰ Motozuna, *Bakumagatsu jōkisen monogatari*, 2004, 144–45.

⁶¹ Perry, *Narrative of the Expedition*, 1856, 212.

⁶² Shulman, *Coal and Empire*, 2015, 79–80.

⁶³ Shulman *Coal and Empire*, 2015, 70.

⁶⁴ “Letter from Commodore Ogden to Commodore Geisinger, June 27, 1849,” in: *American Diplomatic and Public Papers*, vol 12, doc. 2, 1973, 3, ed. in: Davids, *American Diplomatic and Public Papers, the United States and China: Series 2, the United States, China, and Imperial Rivalries*, 1861–1893, 1979.

⁶⁵ “Letter from Gideon Nye to Caleb Cushing, April 10, 1857,” in: *American Diplomatic and Public Papers*, vol 12, doc. 43, 1973, 269. ed. in: Davids, *American Diplomatic and Public Papers, the United States and China: Series 2, the United States, China, and Imperial Rivalries*, 1861–1893, 1979.

Like ore, petroleum, and other natural resources, coal is manifold in quality and value. Accessibility and availability of labor in the vicinity of coal fields was just as central, since coal mining, more so than petroleum drilling, is labor intensive and prone to strikes or infrastructure failure.⁶⁶ The properties of coal from different locations varied greatly in caloric value, storability, and cleanliness – the clearer the smoke, the later a ship was detected, and the higher the caloric value, the better the fleet's performance.⁶⁷ Since the allocation of coal over vast distances was costly, labor intensive, and exposed to disruption, appropriating local coal resources was front and center in Perry's mission. It had been known from Kaempfer's and Siebold's reports that the Japanese mined coal at a considerable scale, but the Japanese were reluctant to reveal its true quality to the Americans, intentionally presenting them with low quality coal, as Perry suspected.⁶⁸

Whether the shrewd Japanese supplied an inferior quality to deceive their visitors, or whether from ignorance of the article and want of mining skill they innocently brought that which was inferior, cannot be certainly decided; but as good coal certainly exists in Japan, and as the natives not only use it, but, according to Von Siebold, know very well how to mine it, the probabilities are that they purposely furnished the poorest samples.⁶⁹

The Japanese had indeed mined and burned fossil coal long before the emergence of steam engines. Fossil energy was used for industrial purposes, though without the use of steam engines or other mechanical translations of heat into movement. Chiefly, fossil energy was used to boil down sea salt, to heat homes, and for proto-industrial practices such as trying out whale blubber.⁷⁰ The western provinces of Hizen, Chikuzen, and Nagato were famously rich in coal fields, and they mined substantial quantities of it long before the advent of steam technology.⁷¹ In the Meiji Period, the old reputation of Japanese coal would prove true: The sinking of the Takashima coal mine in Hizen province under an Anglo-Japanese joint venture in 1866 boosted Japanese coal exports, and by the 1880s, Japanese coal became the preferred type among navies cruising Asian waters (see Figure 5.3).⁷²

⁶⁶ Mitchell, *Carbon Democracy*, 2011.

⁶⁷ Gray, *Steam Power and Sea Power*, 2018, 67–68.

⁶⁸ Perry, *Narrative of the Expedition*, 1856, 481–83.

⁶⁹ Perry, *Narrative of the Expedition*, 1856, 483.

⁷⁰ Yasuba, "Gaikō kaiun to keizai hatten," 1977, 43; Fujimoto, "Bakumatsu kujira-kumi no sekitan shiyō," 1973, 5.

⁷¹ Sakamoto, "Bakumatsu ishin-ki ni okeru jōkisen un'yō," 2018, 27.

⁷² Gray, *Steam Power and Sea Power*, 2018, 83. The coal mine of Takashima near Nagasaki was located in immediate vicinity of the sea and was therefore particularly convenient for shipping and export. Checkland and Checkland, "British and Japanese Economic Interactions Under the Early Meiji," 1984, 139.

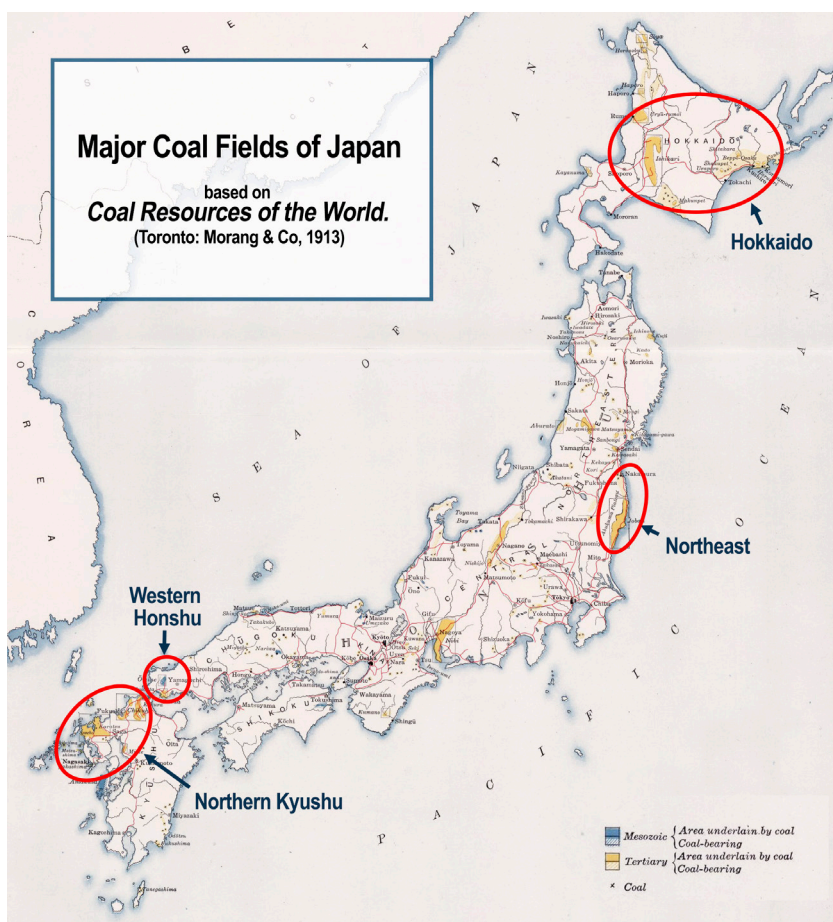


Figure 5.3 Map showing the major coal fields of Japan. Compiled based on *Coal Resources of the World*, in: RUM, David Rumsey Map Collection, David Rumsey Map Center, Stanford Libraries. Acc. No.: 2249.019.

The quest for coaling infrastructure also turned a spotlight on more remote places along the Kuroshio route. Besides the common route south of Honshu, alternative routes for steamboats were planned to lead across the Tsushima strait to Hakodate – the Gibraltar of Japan, as Perry wrote – and the Aleutians before turning south along the American coast.⁷³

⁷³ Shulman, *Coal and Empire*, 2015, 83.

On his way to Japan, the commodore had prepared deposits for up to 500 tons of coal in Naha and in the Bonin Islands, where he purchased large plots of land for harbor and coaling facilities.⁷⁴ Without an effective state affiliation, the recently settled Bonin Islands with the large harbor of Port Lloyd were in a particularly advantageous location, just a few day's sail off Edo Bay. The commodore named three white settlers representatives of the US Navy and stipulated a "constitution" for this colony of "wanderers from many lands, civilized and savage,"⁷⁵ as he phrased it. The thirteen paragraphs of his constitution cemented the authority of the councilmen and entitled them to prosecute, punish, and return ship-jumpers to their ships – closing an escape route for abused sailors and coolies.

Despite controversies in view of the unequivocal evidence regarding the abusive nature of the coolie trade, the hypocritical but dominant opinion among American diplomats remained that it is unnecessary to suppress the trade since "there are many Chinese who are willing to go under the terms offered."⁷⁶ To expand this highly problematic business, Perry envisioned the Bonin Islands as a supply station for passers-by, and as a base to police the region for deserters and mutineers:

Already many thousands of Chinamen are annually embarking for California, paying for their passages each \$50, and finding themselves ill everything, excepting water and fuel for cooking their food. These provident people are the most patient and enduring laborers, and must, by their orderly habits, add greatly to the agricultural interests of California ... The importance of the Bonin Islands to the advancement of commercial interests in the east is so great that the subject has more or less occupied the mind of the Commodore since his return.⁷⁷

Rather than following in the wake of stranded American whalers, whom he professed to protect, Perry pursued a geostrategic agenda in providing naval infrastructure for the expansion of American commerce.

Confidently, he later proclaimed that these arrangements would reduce the shipping time from Shanghai to New York to fifty-two days,

⁷⁴ "Title Deed of Property," contract between Matthew C. Perry and Nathaniel Savory, in: *Matthew Calbraith Perry Additional Correspondence, 1799–1945*. In: HOU. Also see: *Untitled collection of Documents created during Commodore Perry's visit to the Bonin Islands, 1853*, p. 3. In: OVB, Acc. No: Great safe, Compartment 6, 6–2. Perry, *Narrative of the Expedition*, 1856, 212; 282. Fifty dollars were paid in purchase of land to the American-born Nathaniel Savory, whom Perry had installed as an informal authority in the islands.

⁷⁵ Perry, *Narrative of the Expedition*, 1856, 283.

⁷⁶ *United States Diplomatic and Public Papers*, vol. 17, doc. 37, p. 81. ed. in: Davids, *American Diplomatic and Public Papers, the United States and China: Series 2, the United States, China, and Imperial Rivalries, 1861–1893*, 1979.

⁷⁷ *Ibid.*, 212.

bringing the two metropolises closer than London and Hong Kong.⁷⁸ As Jason Smith points out, America's presence at sea until the mid nineteenth century consisted chiefly of whaling and trading fleets, and those naval missions that followed and were generally subservient to the nation's commercial interests. It was only after the Civil War, which had decimated the commercial fleet, that a "Mahanian impetus" gained momentum, in which the navy emphasized the proactive expansion of naval infrastructure and the occupation of strategic sites *ahead* of commercial fleets.⁷⁹ In some way, Perry anticipated the role the navy would play in the *fin-de-siècle* imperialism.

Espionage and Reverse Engineering

In Uraga, Perry's negotiators presented the shogunal authorities with a letter from his president to the "Emperor of Japan," and a few samples of American industry and craftsmanship. Among them was a telegraph and a model train with a fully functional steam engine.⁸⁰ Without ever disembarking, Perry then withdrew from Edo Bay with the announcement to return in the next year with the intention of negotiating a treaty. Almost immediately, the senior council entrusted Egawa Tarōzaemon with the construction of defense positions or *daiba* in Edo Bay, a project of highest priority to be tackled right away.⁸¹ The construction of eleven artificial islands right off the city was realized in a dash starting in the fall of 1853. Within one year, five of the islands were completed and two more were left incomplete when the construction was halted once the fear of an imminent invasion had subsided with the convention of Kanagawa upon Perry's return in 1854.⁸² Despite the quick completion of harbor fortifications, without a sizable fleet of strong-hulled battle ships, Japan remained vulnerable to naval incursion, as Egawa had argued with his ominous scenario of Edo's "strangulation".

In the tenth month of 1853, Egawa asked Abe for permission to hire the castaway Manjirō to build a steam boat. Manjirō had moved to Edo a few

⁷⁸ Ibid.

⁷⁹ Smith, *Boundless Sea*, 2018b, 5–6. Alfred Thayer Mahan's *The Influence of Sea Power Upon History* of 1891 coined the modern understanding of geopolitics as the state-led creation of a geographically defined security infrastructure. Mahan insisted on "the necessity to secure commerce by political measures conducive to military, or naval, strength." Alfred Thayer Mahan, cited in Holmes, "Mahan and the South China Sea," 2014, 61.

⁸⁰ Perry, *Narrative of the Expedition*, 1856, 355; *Letter to the Emperor*, 44.

⁸¹ Nakada, *Izu to kuroshio no michi*, 2001, 192–98.

⁸² Nakada, *Izu to kuroshio no michi*, 2001, 192–93. The term *daiba* or "canon grounds" are not to be confused with the reclaimed lands off Tokyo known as Odaiba today.

months prior, where he had given interviews about the conditions in the West to Abe, Egawa, and other shogunal elite officials.⁸³ The request was granted with the remark that Manjirō was to be kept under strict surveillance lest he would attempt leaving the country or interacting with strangers.⁸⁴ Like earlier naval experiments undertaken in the 1840s, this project, too, was top secret. Building a steamboat from scratch was a daunting task, but Manjirō's ability to read and translate English works on navigation helped lay out the primary exigencies.⁸⁵ Most essential was the construction of hulls solid enough to carry canons or even an engine. As mentioned in Chapter 1, Japanese shipwrights had adapted to wood scarcity and the pressure of commercialized shipping markets by designing cheap vessels easy to handle, but inapt for pelagic sailing, not to mention naval warfare. Square-rigged, these vessels could navigate at most forty-five degrees off the wind, a major handicap compared to fore-and-aft rigged schooners or sloops. Unlike Western vessels, which required massive beams from large trees for the keel and mast, Japanese junks were assembled from small pieces and virtually without any use of metal nails – even the masts were kept together with ropes. Foreign observers often described Japanese ships and sailors with contempt, but as we have seen, these design choices were adaptations to wood shortages and economic pressure.⁸⁶

Just months after the black ships' second visit in March 1854, the Russian admiral Yevfimiy Putyatin reached Shimoda. Like Perry, Putyatin had visited the Bonin Islands in August 1853 before he started treaty negotiations at Nagasaki, almost at the same time as Perry was negotiating at Uraga. Besides the conclusion of a trading treaty, Putyatin's mission was also meant to define the Russo-Japanese borderline in the north.⁸⁷ Due to the outbreak of the Crimean War, however, Putyatin had to interrupt his negotiations and instead sailed to Shimoda again in the following year.⁸⁸ While his fleet was at anchor, the great Ansei Tōkai earthquake struck on December 23. A tsunami of seven meters sank almost every ship in the bay and destroyed most of the harbor town. Only Putyatin's flagship *Diana*, though severely damaged, could be recovered and was moved to a wharf on the western coast of the Izu peninsula on January 15. On its way, however, the battered vessel ran aground off Suruga province and was damaged beyond repair.⁸⁹

⁸³ Nakahama, *Nakahama Manjirō den*, 1936, 198–201.

⁸⁴ *Mōshiwatashi, Kaei 6 ushidoshi 11 gatsu 22 nichi*, in: EGAN.

⁸⁵ Nakahama, *Nakahama Manjirō den*, 1936: 247.

⁸⁶ Arch, "Sailing within Sight of the Land," 2024, 107–08.

⁸⁷ Ōtsuka, *Bakumatsu No Gaikō*, 1933, 6–7.

⁸⁸ *Iwanami Sekai Jinmei Daijiten*, keyword Putyatin.

⁸⁹ Nakada, *Izu to kuroshio no michi*, 2001, 196–215.

Kawaji Saemonnojō, the shogunal chief negotiator in Shimoda, rushed to recover the wreck, tow it to the hidden bay of Heda, and, with the help of the Russian castaways, rebuild the vessel. Putyatin first rejected the offer and suggested instead to just build a small boat to go solicit help from Russia. But Kawaji had already called Manjirō and a group of master carpenters to the site. The shogunate quickly allocated the awesome sum of 2,300 golden *ryō* to build a schooner of 100 tons.⁹⁰ From the *Diana's* wreck, the carpenters had recovered a Russian manual which, with the castaways' technical advice, provided the blueprint for this first Japanese-built schooner.

The two-masted *Heda-gō* was commissioned in the third month of 1855, after just over 100 days of work. At 24.6 meters, the schooner was admittedly much smaller than the large, armed frigate *Diana*, which had carried 500 sailors to Japan. Yet features such as the versatile fore-and-aft rigging, or vertical ribs resting on the keel to support the ship's hull against waves and collisions, were significant innovations for the Japanese shipwrights (Figure 5.4). Admiral Putyatin and forty-seven of his crew set sail in the fifth month of 1855, while the remaining 450 or-so sailors chartered an American trading vessel to return home. The makeshift schooner *Heda-gō* was later returned – towed back – to Japan with the diplomatic gift of fifty-two canons on board.⁹¹ In the meantime, the carpenters at Heda had already built six more vessels of the same design, to be called the *Kimizawa* series. In the eleventh month of the same year, the vessels were commissioned to support the harbor fortifications of Edo.⁹² The sheer pace at which Japanese engineers reversely engineered an oceangoing vessel based on formerly unknown plans reveals ambition and ability in the shogunate's strategic pivot toward the offshore.

While the shogunate was now building a substantial navy, defense duties remained in the hands of different domains. Upon suggestion by shogunal adviser Katsu Rintarō “Kaishū,” the shogunate invited Dutch instructors to teach navigation, mathematics, and astronomy at the newly-founded Shogunal Naval Academy *kaigun denjūsho*. The academy started in 1855, with a program that was centered on the handling of Dutch-built steamboats. It was in this context that the steamboat *Kanrin-maru* was ordered from the Netherlands in late 1854. Delivered

⁹⁰ Egawa Tarōzaemon-dono, *Kawaji Saemonnojō*, in: EGAN; Nakada, *Izu to kuroshio no michi*, 2001, 196–215.

⁹¹ Nakada, *Izu to kuroshio no michi*, 2001, 197–98.

⁹² *Zushū Heda-mura ni oite o-uchitate ainari sōrō schooner-sen...* in: EGAN; Nakada, *Izu to kuroshio no michi*, 2001, 196–215. Four more pieces were built for the Aizu and Chōshū clans, both of which had taken on defense duties in the Edo Bay area.

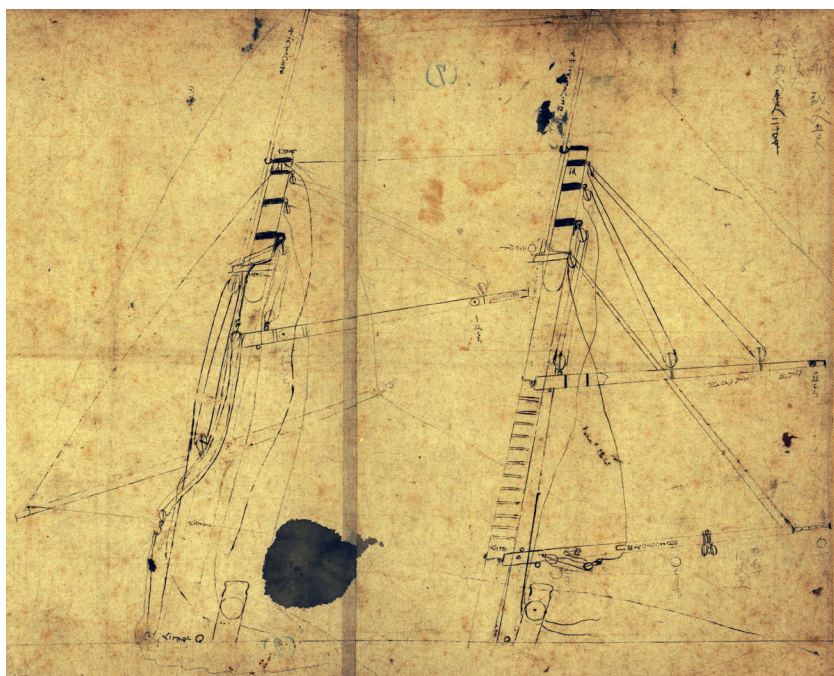


Figure 5.4 Construction plan for the *Heda-gō*'s "fore-and-aft" rigging, 1855. In: Heda Wharf Museum, Numazu City.

in the spring of 1857, the corvette was the first steamboat to sail under the shogunal flag. It is somewhat ironic that the naval academy was so much centered on steam navigation while most naval activity remained propelled by wind. Sakamoto Takuya points out that, until the downfall of the Tokugawa in 1868, just about one-third of the eighty-six steamboats active in Japanese services went on account of the shogunal navy.⁹³

The race for naval technology remained a competition among the autonomous entities of fragmented Japan. Chōshū, a domain rich in coal deposits, harbored particular ambitions in the creation of a domain navy and purchased a force of eight steamboats. Chōshū traded coal with Satsuma, especially after the bombardment of Shimonoseki in 1863, which opened an irreparable abyss between the shogunate and the two powerful western domains. The shogunate, however, remained in control of Japan's only wharf capable of carrying out major engine repairs,

⁹³ Katsu Kaishū's *Kaigun rekishi* counts twenty-nine steamboats sailing for the shogunate versus fifty-seven under domain flags. Sakamoto, "Bakumatsu ishin-ki ni okeru jōkisen un'yō," 2018, 22.

the *Seitetsu-jo* in Nagasaki.⁹⁴ Though the founding of a machine factory and a wharf were expedited in the vicinity of Edo, the shogunate's first and only self-made steamboat, the sixty-horsepower gunboat *Chiyoda-gata*, was not commissioned until March 1867, just months before the fall of the Tokugawa shogunate.⁹⁵

Space and Place of Japan's "Opening"

On January 18, 1862, the shogunal steamboat *Kanrin-maru*, weighed down by cannons, entered the harbor of Port Lloyd in the Bonin Islands, smoking, steaming, and firing salvos. The shogunate celebrated Japan's colonial debut in the island Pacific with a series of visual narratives that underpinned the dramaturgy of Tokugawa gunboat diplomacy by juxtaposing its steam-powered supremacy to a group of islanders approaching on an outrigger canoe (Figure 5.5).⁹⁶ Staffed with the best graduates from the Shogunal Naval Academy and first flying the rising sun as a national symbol, the expedition had been wandering a stormy sea for almost two weeks before it finally located the islands in the vast ocean – a breakneck expedition that could have ended far less glamorously.⁹⁷ After decades of naval reforms, technological research, and navigational training, the shogunate eventually asserted its capabilities by reclaiming the whaling entrepôt in the Bonin Islands. A visual response to the shock Matthew C. Perry's black ships had sent across the Japanese public less than a decade earlier, the shogunal venture to the Bonin Islands could hardly have been more fraught with symbolism of modernity and national power.

This chapter has shown that the so-called "opening" of Japan was a decades-long process that crept in from the archipelago's peripheries, the frontier in a maritime competition over resources and jurisdiction. The places at the forefront of this imperial power negotiation – the harbor of Naha, where foreign vessels called even after the issue of the *Shell-Repel* edict (in vigor 1825–1842), the remote beaches of Iheya and Ishigaki, or the coasts of rural Ezo – were in fact made ports of call before

⁹⁴ Sakamoto, "Bakumatsu ishin-ki ni okeru jōkisen un'yō," 2018, 27, 32.

⁹⁵ Delays on the part of the shogunal shipbuilding projects are related to both organizational back-and-forth, and to diplomatic interference that deflected the technological impetus toward investments into Dutch and American-made steamboats. Besides the *Chiyoda-gata*, the shogunate succeeded in the construction of two steam-powered cargo vessels. Motozuna, *Bakumagtsu jōkisen monogatari*, 2004, 100, 189.

⁹⁶ *Ogasawara-tō fūdo ryakki*, p. 43, in: NAJ.

⁹⁷ Thirty-one of these men were officials; fifty more were crew members of the *Kanrin-maru*. See the complete list of names in *Ogasawara-tō go-takkai* (1862), ed. in Tanaka, "Kaisetsu," 1983, 38–41.

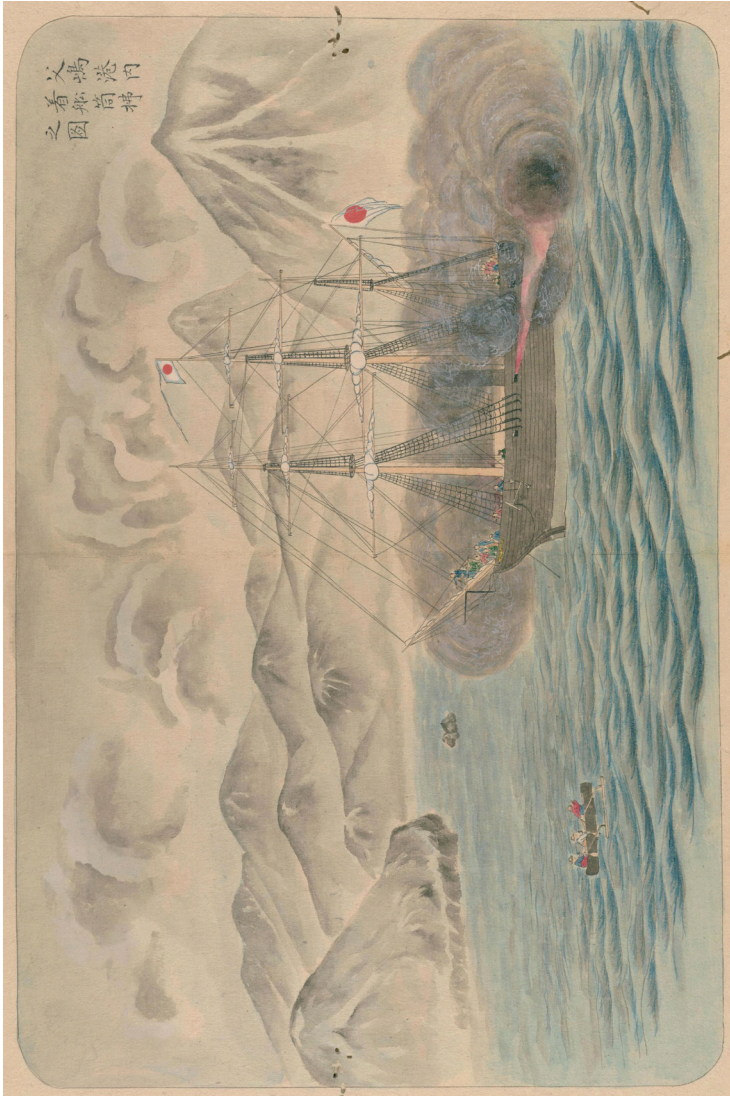


Figure 5.5 The Japanese steamboat *Kanrin-maru* firing salvos in the Bonin Islands on January 18, 1862. In: *Ogasawara-tō shinkeizu* vol. 3, p. 25, in: NDL, Acc. No.: W243.

the age of treaties. The whalers who had settled in the Bonin Islands, again, catered to an industrialization offshore. Though the whalers who populated the ocean since the 1820s could be kept off the Japanese core lands with the issue of the Shell-Repel edict, the conflict-laden coolie transports that picked up along the Kuroshio in the late 1840s, and the steam-powered navies that followed in their wake, brought international conflicts ashore. In the geopolitical vision of naval strategists, maritime Northeast Asia was crisscrossed by an infrastructure web from the coal deposits in Naha and the Bonin Islands to Japanese harbor towns and the coal mines in their hinterland. With the opening of treaty ports of Shimoda, Kanagawa, Nagasaki, Niigata, and Hyōgo, foreign interest focused on Japanese harbors with their ready supply of high-quality Japanese coal, while the dwindling whaling industry retreated to the arctic bays of the Bering Strait. Hakodate, again, turned into a bustling whaling entrepôt within months of the town's opening in 1854, while the whalers gradually retreated from the Japan Ground's southern reaches.⁹⁸ It is along these shifting geographies of industry and infrastructure that Tokugawa Japan sought its place in the power structures of a converging Pacific world.

This decades-long process instigated a technological competition between the shogunate and several powerful domains. The watering of a steamboat prototype by Satsuma in 1855 and the construction of a fully functional model steam locomotive in Saga the same year underline that Japanese steam and naval technology had been in decentralized and classified development since the 1840s, while the shogunate tried to integrate domain resources into its defense dispositions. Repeated approaches of foreign vessels to Edo Bay since 1837 and China's naval defeat in the Opium War against Britain in 1842 had made it clear that maritime defense could no longer center on individual harbors, since Western navies threatened to sever Japan's vital maritime cargo highways. The revocation of the Shell-Repel edict the same year ushered in two conflicted decades of reform and integration. Regardless, the *Robert Bowne* incident of 1852 ultimately evidenced that commercial traffic on the "high seas" had yielded to a naval realpolitik that turned the sea itself into a jurisdiction subject to the law of the stronger.

When Commodore Perry's black ships eventually cruised to Japan in 1853, the commodore was anxious to be surpassed by French or Russian expeditions to Japan. Slowed down by the British with their exclusive control of coaling stations along the way to Asia, Perry installed his own agents in Shanghai with the order to prevent other

⁹⁸ Wilson, "Western Whalers in 1860s' Hakodate," 2020, 40–43.

missions to Japan from purchasing coal.⁹⁹ The steam-powered routes that were to cross the Pacific in the commodore's vision were meant to reduce travel time from New York to Shanghai to fifty-two days – the same duration mail employed from Liverpool.¹⁰⁰ With the Atlantic slave trade under pressure, the commodore also sought to facilitate the trafficking of indentured “coolie” laborers shanghaied in Asian harbors and ferried across the Pacific along the Kuroshio route.¹⁰¹ In the Bonin Islands, he instated three white settlers as representatives of his government over the heterogeneous community of farmers and marooned crew, with explicit orders to prosecute ship-jumpers. The military guidance for the expansion of American commerce Perry practiced was, in some way, an anticipation of even cruder *fin-de-siècle* imperialism. It was this infrastructure-oriented imperialism the shogunate aspired to imitate when they informed all foreign representations in late 1861 that the shogunal navy would soon reclaim what they contended was an abandoned colony of theirs in the Bonin Islands.

⁹⁹ Shulman, *Coal and Empire*, 2015, 85–86. Perry was quite outraged to learn in November 1853 that the Russian Admiral Yevfimiy Putyatin purchased twenty tons of coal Perry had kept aside for American needs.

¹⁰⁰ Perry, *Narrative of the Expedition*, 1856, 212.

¹⁰¹ The major Atlantic slave trading nations had banned slave trade, but not slavery itself, between 1802 (Denmark) and 1836 (Portugal). Britain was the first empire to completely ban slavery with the emancipation act of 1833. Meagher, *The Coolie Trade*, 2008, 27–29. The verb “to Shangai” specifically describes the practice of drugging and abducting workers by having them sign a contract.