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Trading locomotives between the USA and Japan: Okura & Co. at the beginning of the twentieth century

Naofumi Nakamura

Institute of Social Science, The University of Tokyo, Tokyo, Japan
Email: naofumin@iss.u-tokyo.ac.jp

Abstract

This article examines international transactions related to steam locomotives at the beginning of the twentieth century while focusing on Japanese trading companies. In particular, it considers in detail how Japanese trading companies acquired the knowledge and know-how of locomotive trading to carry out their business transactions through a case study of Okura & Co.'s New York branch office. The analysis highlights the following three factors that supported Okura's locomotive trade in New York: first, the company took advantage of business opportunities by collecting information through networks of Japanese contacts in New York and local experts; second, it utilised social and technological infrastructure, including international communication lines, transportation, and financial systems, as key fundamentals of its overseas activities; third, a former *oyatoi* (hired foreigner) played a critical role as its consulting engineer. In particular, the overseas activities of Japanese trading companies drew heavily on formerly hired foreign engineers, whose technological knowledge and networks became an essential route of knowledge transfer in cross-regional commercial management. These will contribute to the evolution of history related to the starting points of global activities of Japanese trading companies.

Keywords: hired foreigner; Japanese trading companies; locomotive trade; New York; Okura & Co.

Introduction

This article investigates international transactions related to steam locomotives in the late nineteenth and early twentieth centuries. It focuses on Japanese trading companies, paying special attention to how these entities, using access to expanding social infrastructure, acquired the knowledge and know-how of locomotive trading to conduct their business transactions. In doing so, it identifies an essential contribution to knowledge transformation in cross-regional commercial management around the turn of the century. These will also contribute to the evolution of history related to the starting points of global activities of Japanese trading companies.

When considering the development of the railways as infrastructure symbolic of the Industrial Revolution, it is essential to ask how and to whom the necessary materials of the industry were supplied. In particular, because steam locomotives represented a collection of cutting-edge technologies, Japan experienced difficulties achieving self-sufficiency in this field prior to World War I.¹ In those days, therefore, the importation of locomotives

¹ M. Sawai 沢井実, *Nihon tatsudō sharyō kōgyō shi* 日本鉄道車輛工業史 [A History of Japan's Railcar Industry] (Tokyo, 1998), chapter 1.

was essential to the development of Japanese railways. Instead of focusing on steam locomotive technology, this article examines how these machines and associated parts were smoothly imported into Japan.² Answering these questions requires investigating the nature of locomotive-related transactions alongside the activities of the trading companies that mediated this business.

The machinery business handled by trading companies played a significant role in developing modern industries in Japan and other parts of East Asia. However, the production of high-precision machinery was technically difficult in Japan from the late nineteenth to the early twentieth centuries, and ordinary investors and merchants also had little chance of obtaining information about such products. Trading companies, therefore, contributed to industrialisation by introducing information about foreign products to Japan and procuring the machinery necessary for their domestic customers from overseas. The export of locomotives to Japan around the turn of the century is characterised by the emergence of American locomotive manufacturers and Japanese trading companies. Until the early 1890s, British makers and trading companies monopolised Japan's railway market. However, from the end of that decade, American and German makers entered the market and rapidly expanded their presence. In the late nineteenth century, the American and German trading companies that played this role were well informed about machine-producing countries. Yet, by the turn of the century, the Japanese trading companies had cultivated capabilities for foreign trade and begun replacing their overseas counterparts.³ How did these Japanese trading companies accumulate knowledge and know-how related to the international trade of machinery? This article draws particular attention to the case of Okura & Co. (大倉組, hereafter Okura)—a mid-sized general trading company in Japan that was renowned for its role in the machinery trade during the Meiji era, and was also involved in trading with both British and American manufacturers.

Historical studies have traditionally focused on large Japanese trading companies such as Mitsui Bussan (三井物産, Mitsui & Co.; hereafter Mitsui).⁴ Prior to World War II, Mitsui was the most famous trading company in Japan and the core company of Mitsui Zaibatsu, the country's most influential financial group at that time. However, intense competition in the Japanese locomotive market constrained its market share.⁵ Mitsui competed with not only foreigners, but also many compatriots' medium-sized trading companies; the latter played a significant role in the machinery trade, which was highly specialised and required the personnel of trading companies to have technical experience. On this front, Okura had specialists such as Kadono Chōkurō (門野重九郎), director and general manager of the London branch, who had a background as a railway engineer. However, studies of medium-sized trading companies such as Okura have been slight and neglectful

² One reason for this phenomenon was the increase in the machinery trade that accompanied the growth of the first global economy. See G. Jones, *Multinationals and Global Capitalism* (Oxford, 2005).

³ In contrast, traders in modern China cooperated with foreign trading companies to procure machinery and conduct business, which enabled the latter to remain leading players in machinery trade within China. See Y. Lin 林玉茹, 'Kuaguo maoyi yu wenhua zhongjie: Kua zhengquan xia Tainan diyi fushen Wang Xuenong de chuxian 跨國貿易與文化中介: 跨政權下臺南第一富紳王雪農的出現 (1880–1905) [Cross-national trade and cultural brokers]', *Taiwan shi yanjiu* 台灣史研究 [*Taiwan Historical Research*], 27.4 (2020), pp. 56–58, 66.

⁴ M. Kasuya 粕谷誠, *Gōshō no Meiji 豪商の明治 [A Wealthy Merchant in the Meiji Period: The Case of the House of Mitsui]* (Nagoya, 2002); K. Uyeyama 上山和雄, *Hoku Bei niokeru sōgō shōsha no katsudō* 北米における総合商社の活動 [*The Activities of General Trading Companies in North America*] (Tokyo, 2005); S. Asajima 麻島昭一, *Senzen ki Mitsui bussan noikai torihiki* 戦前期三井物産の機械取引 [*Mitsui Bussan's Machinery Trade in the Pre-War Era*] (Tokyo, 2001); H. Mizuno and I. Prodöhl, 'Mitsui Bussan and the Manchurian soybean trade: geopolitics and economic strategies in China's Northeast, ca. 1870s–1920s', *Business History*, Taylor & Francis Online (December 2019), pp. 1–10.

⁵ N. Nakamura 中村尚史, *Umi wo wataru kikansha* 海をわたる機関車 [*Locomotives from Across the Sea*] (Tokyo, 2016), p. 181.

of the substance and role of the subject—a shortcoming that this article aims to address. By focusing on medium-sized trading companies, the social infrastructure supporting the activities of Japanese trading companies will become more apparent. This would be an essential contribution to clarifying the overall picture of the history of Japanese trading companies.

In contrast, related to the locomotive trade, Steven J. Ericson has examined activities by American locomotive manufacturers in Japan and competition among British, American, and German locomotive manufacturers in that market based on a notebook kept by Willard C. Tyler, a sales representative of the American Locomotive Company and other railway equipment manufactures.⁶ Ericson's works are essential references for understanding the process of locomotive importation in Japan and are direct predecessors to this article. While Ericson's articles investigate the locomotive trade from the viewpoint of US makers and intermediaries, this article focuses on the activities of a Japanese trading company via a case study of Okura.

In addition, this sheds new light on the subsequent activities of formerly hired foreigners—the *oyatoi* (お雇い), who contributed to Japan's industrialisation in the early Meiji period. Previous research on hired foreigners has focused on their role in introducing Western knowledge and technology to Japan in the 1860s and 1870s.⁷ However, the former *oyatoi* played a significant role as consulting engineers, advisers, or traders until the 1900s. This article focuses on the role of hired foreign engineers who supported Japan's industrial revolution rather than the early stages of industrialisation in Meiji Japan, based on the cases of the import trade of locomotives.

For its analysis, it draws on a collection of materials from the US National Archives in the Office of Alien Property Records (Record Group 131), which contains documents related to Japanese companies in the USA. This archive contains sources that clarify the details of Okura's activities regarding the import of railway equipment. Cross-checking these sources with Ericson's studies allows us to clarify the overall picture of how the trade in locomotives developed between the USA and Japan.

Japan's railways and locomotive trade

The development of Japan's railways

In 1872, the first government-operated railway in Japan opened from Shinbashi to Yokohama with the support of British capital, technology, and materials. Japanese and Chinese railways shared a common starting point in that the construction of their railways was mainly financed by loans from Great Britain and other world powers. However, in the 1880s, Japan's railways succeeded in breaking away from financial dependence on the British by raising funds from wealthy domestic agents such as merchants and landowners. In addition, they simultaneously cultivated their technological ability. These developments allowed Japan to freely procure railway materials from all over the world from the late 1890s onwards.⁸

⁶ S. J. Ericson, 'Importing locomotives in Meiji Japan', *Osiris*, 13 (1998); also S. J. Ericson, 'Taming the iron horse', in *Public Spheres, Private Lives in Modern Japan, 1600-1950*, (eds.) G. L. Bernstein, A. Gordon, and K. W. Nakai (Cambridge, MA, 2005).

⁷ See N. Umetani 梅溪昇, *Oyatoi gaikokujin: Meiji Nihon no wakiyaku tachi お雇い外国人: 明治日本の脇役たち* [A Study of the Hired Foreigners: Supporting Actors in Meiji Japan] (Tokyo, 1965), pp. 230-37; and H. J. Jones, *Live Machines: Hired Foreigners and Meiji Japan* (Vancouver, 1980), chapter 2.

⁸ Chinese railways depended on the foreign capital and technology at least until after World War I. See E. Köll, *Railroads and the Transformation of China* (Cambridge, MA, 2019).

Between the late 1880s and the 1890s, many private railways were established nationwide, creating railway booms that played a central role in Japan's industrial revolution. By 1900, there were five big railway companies and 36 middle-sized and small railway businesses, with the number of privately operated locomotives more than twice that of national lines.⁹ The development of private railways led to the diversification of the national origins of locomotives, as operators sought to internationally procure the best as cheaply as possible. During the railway booms, new railcars were increasingly imported from the USA, leading to a domination of American locomotives in the Japanese market.¹⁰ A competitive world locomotive market and the intermediary role of trading companies further facilitated global procurement. For small and medium-sized railway businesses with limited technological capabilities, trading companies had an essential role in procuring materials, particularly the medium-sized concerns that managed those trades.

Social infrastructure for locomotive trades

When examining the activities of mid-sized trading companies such as Okura, we must consider the underlying social infrastructure—communication, transportation, and financial—that supported their activities. Okura's New York office was established in 1901, at around the same time as transportation and information networks connecting East Asia and North America were starting to rapidly develop. In 1896, Nippon Yusen¹¹ successfully negotiated an agreement with the Great Northern Railway to connect land and sea service, and launched a Japan–Seattle route. In 1898, Toyo Kisen¹² concluded a similar agreement with the Southern Pacific Railroad and launched a sea route from Hong Kong to San Francisco. The establishment of these transpacific shipping routes enabled Japanese trading companies in New York to frequently exchange mail with their head offices in Japan.

With regard to freight transport, numerous new shipping companies connecting New York and East Asia via the Suez Canal entered the market in rapid succession from 1901 to 1902, leading to the creation of regular shipping routes using newer, faster steamships. As a result, the time required to ship freight between New York and Yokohama shrank from four to three months, while the shipping frequency increased to approximately 1.7 ships per month.¹³ Meanwhile, with regard to foreign bills of exchange, which were essential to the trading business, the Yokohama Specie Bank took care of Japanese trading companies, even providing bridge loans when necessary. Further, the promotion of the Japanese consul in New York to a consulate general in 1902 led to the complete protection of Japanese expatriates and more information for Japanese companies doing business in the USA. Okura used this external infrastructure to open a branch office with minimal human resources and funds.

⁹ The number of locomotives under private operation was 892 cars and under government operation was 387 cars. Sawai, *Nihon testudō sharyō kōgyō shi*, p. 16.

¹⁰ From 1888 to 1907, 906 locomotives were imported from the USA to Japan. At same time, the 871 British locomotives and 160 German locomotives were imported. See *ibid.*, p. 27.

¹¹ Nippon Yusen was established in 1885 and is the largest steamship company in Japan. It was one of the Mitsubishi Group's core companies. See W. D. Wray, *Mitsubishi and the N.Y.K., 1870–1914* (Cambridge, MA, 1984).

¹² Toyo Kisen was established in 1896 by Asano Sōichirō (浅野総一郎). It was the number three Japanese steamship company during the pre-World War II period.

¹³ Zai nyūyōku sōryōji 在紐育帝国総領事館 [the consul general of Japan in New York], 'Hōkoku: Nyūyōku kō to nishin ryōkoku sonota tōyō shokō tonō kōun jōko 報告: 紐育港ト日清兩國其他東洋諸港トノ航運狀況 [Report from the consul general of Japan in New York on the shipping situation between New York and East Asian ports including Japan and China] (29 November 1907)', *Tsushō isan Meiji 41 nen 通商彙纂 明治 41 年 [Collections of trade reports 1908]*, 4 (1908), p. 103.

Okura's trade in railway materials

Okura was established in 1893, with international trade as its primary business, and it sought engagement in various military and mining industries. Ōkura Kihachirō (大倉喜八郎), a company president, was one of the famous *goyō shōnin* (御用商人 purveyors to the government) in the early Meiji period and later the founder of the Okura Zaibatsu. He was a typical arms dealer whose business interests were in guns, other munitions trading, and military shoe manufacturing. At the time of its founding, Okura had only one overseas branch, in London, but it had agents in San Francisco, New York, Paris, Berlin, Melbourne, Sydney, Colombo, Calcutta, Bombay, Shanghai, Tianjin, and Hong Kong. In Japan, besides its head office in Tokyo, the company had six domestic branches, a leather manufacturing plant, and a gun shop. The director of the London branch office was Kadono Chōkurō,¹⁴ a former railway engineer turned merchant of industrial goods, who supervised agents in Europe and the USA.

Okura began brokering locomotives with its purchase of 48 British locomotives (Dübs' 0–6–2 tank) in 1901–02 for the Imperial Government Railway of Japan (IGR).¹⁵ At around the same time, it purchased six British locomotives (Nasmyth's 2–4–2 tank) for the Government-General of Taiwan.¹⁶ From this, it is evident that Okura's trade in railway goods began in earnest with British goods. In addition, the company established a New York branch in 1901 to broker the sale of American-made machinery and railway goods. The New York office, together with the London branch office, engaged mainly in the trade of machinery. Its first branch manager, Yamada Majirō (山田馬次郎), joined the company after graduating from Tokyo Higher Commercial School in 1894;¹⁷ after engaging in the machinery trade at the company's London office,¹⁸ he made his way alone to New York.

Yamada left a 'letter book' from his time in London and, when he first moved to New York, he also left numerous copies of business correspondences with the Tokyo head office overseas department and others in a tracing-paper booklet entitled *Domestic Letters 1900–1901*.¹⁹ Between 1901 and 1905, he produced eight volumes of tracing-paper booklets containing such copies, entitled *Tokio Letters*.²⁰ These documents provide fresh insights into the detailed activities of Okura's US branch during the Meiji era.²¹

The Hokkaido Government Railways tender

Yamada arrived in New York on 12 April 1901 to open Okura's new branch office.²² He began enthusiastically collecting information immediately after reaching New York and

¹⁴ Kadono graduated from the Department of Civil Engineering in the College of Engineering, Imperial University in 1891 and got a job in the Pennsylvania Railroad Company in 1892. In 1896, he returned to Japan and became a section chief engineer at Sanyo Railway Company; in 1897, he joined Okura & Co. and became the director of the London branch.

¹⁵ Dübs & Co., General Particulars of Engines, Tenders, Dübs Records 3/1/1–2 (Glasgow University Archives).

¹⁶ Nasmyth Papers, *Loco Specifications 1867–1922*. This trade was also conducted in 1901–02.

¹⁷ Yamada Majirō was born 1870 in Wakayama Prefecture, Japan. He became the Okura & Co. vice president for business affairs in December 1917, and subsequently its president and a member of its board of directors. Unfortunately, there is no information on Yamada's early years at Okura & Co. and his private life. See Kōjunsha 交詢社, *Nihon shinshiroku Showa 16 nen han* 日本紳士録 昭和 16 年版 [*Who's Who 1941*] (Tokyo, 1941), 'ya' column, p. 111.

¹⁸ No. 1 *Domestic Letters 1900–1901*, p. 17, RG131/A1/Entry–123/Box–838 Okura (NARA College Park).

¹⁹ *Ibid.*

²⁰ RG131/A1/Entry–124/Box–856 and 857 Okura.

²¹ For a key study, see Ōkura zaibatsu kenkyūkai 大倉財閥研究会 (ed.), *Ōkura zaibatsu no kenkyū* 大倉財閥の研究 [*A Study of the Okura Zaibatsu*] (Tokyo, 1982).

²² 'A letter from Yamada to Uchiyama Yorikichi (20 April 1901)', No.1 *Domestic Letters*, p. 32.

started fully fledged business activities on 9 June after moving into a space on Broadway.²³ At the time of its launch, the New York branch office consisted of one director, one typist, and one messenger boy. For the next 10 months, Yamada personally carried out almost every aspect of the work.²⁴ This included vigorously visiting journalists at American trade magazines such as *The Iron Age* to get technical and industry information related to machinery.²⁵ The first major job of his office entailed purchasing six locomotives for the Hokkaido Government Railways.

On 10 June 1901, the Hokkaido Government Railways issued a call for tenders regarding the procurement of six locomotives and other railway equipment to enhance its facilities in view of route expansions.²⁶ A quote request for this tender arrived at Yamada's office sometime between 13 and 15 July, over a month after the initial announcement. Upon receiving the notice, Yamada issued requests for quotes to major manufacturers of American locomotives and railcar components on 15 and 17 July.

At this time, the American locomotive manufacturing industry was undergoing large-scale consolidation, resulting in the merger of eight locomotive manufacturers centred on Schenectady Locomotive Works (Schenectady) in July 1901 to establish the American Locomotive Company (ALCO). This merger narrowed the field of major American locomotives to just three companies: ALCO, Baldwin Locomotive Works (Baldwin), and Rogers Locomotive Works (Rogers). Yamada sent information regarding this change to the London branch office and the Tokyo head office on 20 and 23 July, respectively.²⁷ In this letter, he mentioned that ALCO's vice president and head of the sales department were both from Schenectady and that Mitsui,²⁸ which had many previous transactions and strong connections with Schenectady, would likely serve as the new company's agent in East Asia. Yamada thus speculated that, even if ALCO provided a quote for the six locomotives in this tender to a firm other than Mitsui, it would not be an honest price. Indeed, although Yamada visited ALCO repeatedly to conduct negotiations, he ultimately failed to obtain a price quote.²⁹

Just as Schenectady and Mitsui had formed a close partnership, Baldwin had built a strong business relationship with Frazar & Co.—a mid-sized American trading company with offices in Yokohama and New York.³⁰ Since the Hokkaido tender came after Frazar had already requested a price quote, Yamada was also unable to obtain a price from Baldwin.³¹

On the other hand, the third major manufacturer, Rogers, could accept the request from Okura because it had no agents or sales representatives in Japan. Yet, the manufacturer had temporarily suspended business due to the passing of the company's former president. Yamada still requested a quote from Rogers on the basis of having recently

²³ 'A letter from Yamada to the Tokyo head office, overseas department (10 June 1901)', *ibid.*, pp. 193–94.

²⁴ 'A letter from Yamada to the Tokyo head office, overseas department (5 February 1902)', *Tokio Letter No. 2* (1902), pp. 103–04, RG131/A1/Entry-124/Box-856 Okura.

²⁵ N. Nakamura 中村尚史, 'Ökura-gumi New York shiten no shidō to tetsudō yōhin torihiki 大倉組ニューヨーク支店の始動と鉄道用品取引 [The establishment of Okura & Co.'s New York branch and the trade of railway materials]', in *Senzen ki Hokubei no Nihon shosha 戦前期北米の日本商社 [Japanese Trading Companies in the North America during the Pre-War Period]*, (eds.) K. Uyeyama and Y. Kikkawa (Tokyo, 2013).

²⁶ *Kanpō 官報 [Official Gazette]*, 5379 (10 June 1901), p. 183.

²⁷ 'A letter from Yamada to the Tokyo head office, overseas department (23 July 1901)', *No. 1 Domestic Letters*, pp. 421–25.

²⁸ Japan's biggest general trading company before World War II and later an agent for the American Locomotive Company.

²⁹ 'A letter from Yamada to the Tokyo head office, overseas department (23 July 1901)', *No. 1 Domestic Letters*, pp. 421–25.

³⁰ Nakamura, *Umi wo wataru kikansha*, pp. 108–10.

³¹ 'A letter from Yamada to the Tokyo head office, overseas department (23 July 1901)'.

heard that a proprietor had been decided and that the factory would soon resume operations. However, he also noted that, given the company's situation, he did not expect them to give Okura a quote.³²

Consolidation in the American locomotive manufacturing industry increased the advantage of trading companies like Mitsui and Frazar, which had entered the market early and developed long-term business relationships with the remaining manufacturers, thus leaving little room for latecomers such as Okura. For this reason, Yamada's initial attitude was pessimistic, as evidenced by the following comment: 'Unfortunately, I do not think we [Okura] will be able to participate in this tender for six locomotives.'³³

However, on 25 July 1901, Okura's New York branch received notification that Rogers 'would very much like to provide a quote for the tender by the Hokkaido Government Railways for six locomotives'. In response, Yamada requested that Rogers provide a price quote by the following Monday and simultaneously asked the Tokyo head office to consider the possibility of submitting a bid for the six locomotives based on the price from Rogers.³⁴ Thereafter, on 4 August, Yamada visited Rogers in Paterson, New Jersey, where he saw that its factory had resumed operations and learned from its president that the company planned to produce an average of 200 locomotives per year.³⁵ On 6 August, price quotes from Rogers for six mogul-type (2-6-0) tender locomotives and other railway goods arrived, which were promptly telegraphed to the Tokyo head office.³⁶ Given that the per-locomotive price in this quote was USD 9,833 compared with the per-locomotive price offered by Rogers of USD 9,250,³⁷ the difference of USD 583 (6 per cent of the price per locomotive) is likely to have been Okura's commission or brokerage fee. Since the average brokerage fee for railway goods around that time was 5 per cent, this quote would have been considered reasonable.³⁸

When the Hokkaido Government Railways held its tender on 10 August 1901, Okura was awarded a contract for locomotives, wheels, axles, and springs. This news was telegraphed on the same day to the New York branch office, which promptly sent out orders for the items.³⁹ Upon receiving news of the successful bid from the Tokyo head office, Yamada immediately telegraphed Kadono in London and asked him to come to New York as soon as possible.⁴⁰ In summoning Kadono, who had approval authority and know-how of the machinery trade, Yamada, suddenly responsible for the first major order of the New York branch (valued at USD 70,000), hoped to eliminate the time and effort needed to exchange information between New York and London and facilitate the ordering process. Kadono obliged by arriving in New York on 24 August, where he remained until the order for railway goods was settled on 17 September.⁴¹ At a time when transportation and communication systems remained undeveloped, it was more efficient to have officers with approval authority travel to make decisions on the spot, rather than waiting for the head office to approve each item.

³² *Ibid.*

³³ *Ibid.*

³⁴ 'A copy of a telegraph to Rogers (25 July 1901)', *No. 1 Domestic Letters*, p. 436; 'A letter from Yamada to the Tokyo head office, overseas department (28 July 1901)', *ibid.*, pp. 442-45.

³⁵ 'A letter from Yamada to Kadono Chōkurō (4 August 1901)', *ibid.*, pp. 458-60.

³⁶ *Tokio Letter No. 1*, p. 16.

³⁷ 'A letter from Yamada to the Tokyo head office, overseas department (1 October 1901)', *ibid.*, pp. 170-74.

³⁸ As of 1898, Frazar & Co.'s brokerage fee for Baldwin locomotives was 5 per cent. Baldwin Locomotive Works, *Engine Orders, 1898-1900* (Smithsonian Institution Archives).

³⁹ *Tokio Letter No.1*, pp. 17-18.

⁴⁰ 'A telegraph to Kadono (10 August 1901)', *ibid.*, p. 13.

⁴¹ 'A letter from Yamada to the Tokyo head office, overseas department (30 August 1901)', *ibid.*, pp. 62-66; 'A letter from Yamada to the Tokyo head office, overseas department (20 September 1901)', *ibid.*, pp. 151-54.

The locomotive trade in New York

What procedures were involved in ordering, delivering, and paying for locomotives? The purchasing process and route of machinery, such as locomotives, were different in countries and periods.⁴² It is thus worth clarifying the specifics of the machinery trade in the USA around 1900 through examining the locomotive trade carried out by Okura in its New York branch office.

Price negotiations

In competitive tenders for railway materials, trading companies obtained price quotes from manufacturers and, after they added brokerage fees, submitted a bid based on the delivery date and specifications stipulated by the tender's issuing party. If a company successfully won a bid, it placed official orders with the manufacturers that had provided the price quotes. Strictly speaking, however, manufacturers were not determined when a contract was awarded and there was no rule that the manufacturers who submitted the price quotes had to be used. This explains why Okura's New York branch sent out new requests for price quotes from each manufacturer after being awarded the Hokkaido Government Railways contract for locomotives and other components.⁴³ In addition, Yamada visited Baldwin and ALCO to solicit price quotes and initiate long-term business partnerships. However, the two companies expressed their intent to maintain their long-standing trade relationships with Frazar and Mitsui, extinguishing Yamada's hopes of obtaining quotes. Through this process, Yamada realised anew the importance of forming an exclusive trade relationship with Rogers, which had prepared the original price quotes, and thereon he strongly promoted getting an agency agreement with Rogers.⁴⁴

Meanwhile, since the winning bid was already fixed at USD 9,833 per locomotive,⁴⁵ any lowering of the product price would mean higher handling fees for Okura. However, because Yamada's negotiations with Baldwin and ALCO did not go well, it was impossible to predict the 'market price' of a discount. As such, Yamada consulted J. U. Crawford, formerly hired foreigner for the *Kaitakushi* (開拓使, Hokkaido Development Commission) with substantial experience as an inspector of railway materials exported from the USA, on a purchase of Schenectady locomotives by Kyushu Railway. This information prompted Yamada to request a 5 per cent discount from Rogers—a development I later discuss in detail. However, negotiations foundered and the order was ultimately placed with Rogers at the price originally quoted at the end of August.⁴⁶

Delivery

Having gotten this far with ordering the locomotives for the Hokkaido Government Railways, the thorny issue of the delivery date remained. To begin with, according to the original tender, delivery to the Asahikawa would occur in February (four locomotives)

⁴² On the post-World War II period, see M. Sawai 沢井実, *Yushutsu rikkoku no jidai, Nihon no keikikai kōgyō to America shijō 輸出国の時代 [In the Age of Export Nations: Japan's Light Machinery Industry and the US Market]* (Nagoya, 2022).

⁴³ 'A letter from Yamada to the Tokyo head office, overseas department (13 August 1901)', *Tokio Letter No. 1*, pp. 21–24.

⁴⁴ *Ibid.*

⁴⁵ This means that the tender decided only on price; the trading company that won the bid was free to decide which manufacturer to place the order with.

⁴⁶ 'A letter from Yamada to the Tokyo head office, overseas department (30 August 1901)', *Tokio Letter No. 1*, pp. 62–66.

and April (two locomotives) of 1902.⁴⁷ Considering the time required for shipping, delivery to the New York port needed to take place in October and December 1901, which left only two and four months for the respective shipments from their ordering in August. This was a short lead time for locomotive production, for which the general rule was made-to-order manufacture. Concerning the lead time, as shown in Table 1, American manufacturers enjoyed a substantial advantage over their British counterparts, with the shortest and average lead times for the latter generally being three months (Neilson & Co.) up to almost a year compared with one month to three months (Baldwin).

As such, given that British manufacturers would have had difficulty accommodating a lead time of only two to four months, it seems likely that this tender targeted American manufacturers from the beginning. That said, the lead times of American manufacturers had also been increasing from 1899 owing to increased domestic demand. In 1900, Baldwin had an average lead time of 234 days.⁴⁸ Furthermore, exports of locomotives to Japan had started to decline as a result of the railway boom in the USA, leading Yamada to observe that ‘at any rate, during periods when orders for products bound for the domestic market are flourishing, as has been the case recently, small-volume, low-margin exports bound for Japan are not preferred’.⁴⁹ In fact, Baldwin’s exports to Japan fell dramatically from 115 locomotives in 1897 to fewer than 10 in 1898.⁵⁰

Given these circumstances, Okura’s Tokyo head office predicted from the start that the delivery date could not be met and instructed the manufacturer to submit a letter explaining the late delivery to the Hokkaido Government Railways.⁵¹ Yamada, assuming shipment from New York in January 1902 with delivery to Asahikawa in May of the same year,⁵² met with Rogers to come up with a reason for this setback. The explanation they settled on referred to a strike by US steel workers that had occurred in August 1901.⁵³ A letter from the Japanese consul in New York (with whom Yamada had friendly relations) certified the event as a general strike despite its small scale in reality, allowing it to serve as an acceptable excuse for the delay.⁵⁴ After discussing the propriety of this reason with the Tokyo head office and Uchiyama Yoriyoshi (内山頼吉) of the executive staff of Okura-gumi Gun Shop, who had stopped by New York as part of a tour of Europe and the USA in December of the same year, Yamada sent a letter of explanation signed by Rogers to the Hokkaido Government Railways. Its acceptance enabled the delivery of the first four locomotives to be postponed by four months and that of the last two locomotives by two months.⁵⁵ Following the same procedure, Yamada also requested that the delivery of other railway goods included in the awarded contract be delayed by one month.

⁴⁷ No. 1 *Domestic Letters*, p. 374.

⁴⁸ Of course, the Hokkaido Government Railways did not know this, as companies keep lead times top secret. However, it is possible that the Hokkaido government estimated the delivery time using common information before 1899.

⁴⁹ ‘A letter from Yamada to the Tokyo head office, overseas department, 6 December 1901’, *Tokio Letter No.1*, pp. 385–91.

⁵⁰ Nakamura, *Umi wo wataru kikansha*, p. 157. Japan experienced what is often referred to as its ‘second railway boom’ between 1896 and 1899. The number of locomotives imported during this time increased from 1,621 in 1896 to 4,236 in 1897, peaking at 4,266 in 1898 and subsequently falling back to 1,968 in 1899. See Sawai, *Nihon tetsudō sharyō kōgyō shi*, p. 26, Table 1–7.

⁵¹ ‘A letter from the Tokyo head office to the New York branch (10 August 1901)’.

⁵² ‘A letter from Yamada to the Tokyo head office, overseas department (13 August 1901)’, *Tokio Letter No. 1*, pp. 21–24.

⁵³ ‘A letter from Yamada to the Tokyo head office, overseas department (7 September 1901)’, *ibid.*, pp. 117–21.

⁵⁴ ‘A letter from Yamada to the Tokyo head office, overseas department (26 November 1901)’, *ibid.*, pp. 348–52.

⁵⁵ ‘A letter from Yamada to the Tokyo head office, overseas department (2 November 1901)’, *ibid.*, pp. 278–83.

Table 1. Comparison of delivery times between British and American locomotives exported to Japan

Year	Neilson & Co. (British)				Baldwin Locomotive Works (American)			
	Shortest	Longest	Average	No. of shipments	Shortest	Longest	Average	No. of shipments
1893	122	214	183	12	64	174	129	25
1894	90	118	105	12	38	158	66	30
1895	109	109	109	6	38	62	53	13
1896	180	302	240	18	30	70	55	31
1897					36	102	58	115
1898					61	83	68	7
1899	290	390	340	32	105	105	105	9
1900					185	302	234	8

Note: Delivery time is the number of days from order to shipping, not including transportation days. Source: Baldwin Locomotive Works, *Engine Orders* (in Smithsonian Institution Archives) and Neilson Co., *Engine Orders*, NBL/2/1/1 (in National Railway Museum).

Despite these postponements, difficulties in procuring locomotive components caused yet more delivery delays, with penalties levied in some cases.⁵⁶ For railway goods, whose associated handling fee rates were low to begin with, the application of a penalty could mean a substantial loss.⁵⁷ Okura's Tokyo and London offices thus paid close attention to locomotive delivery dates.⁵⁸ To that end, Yamada visited the Rogers manufacturing plant and urgently pressed them to stay on schedule.⁵⁹ In short, both the manufacturer and the trading company scrambled to meet the deadline of 15 January 1902.

Four locomotives were shipped from Rogers on 27 January 1902 and loaded onto the New York and Oriental Steam Ship Co. (NY&O) steamship *Satsuma* on 1 February.⁶⁰ However, the two remaining locomotives that were supposed to have been loaded onto the same ship did not arrive on time and ended up being loaded onto the next steamship, the *Shimosa*.⁶¹ According to a memo from Yamada, the *Satsuma* left New York on 2 February and was scheduled to arrive in Yokohama via the Suez Canal sometime in April. The *Shimosa* was scheduled to set sail on 15 February and arrive in Yokohama via the same route in mid-May.⁶² Yamada thus believed that both shipments would meet the delivery date of 15 June in Asahikawa. However, the arrival of the *Shimosa*, which was coming from England, met substantial delay due to bad weather; it set sail from the Port of New York on 6 March, some 20 days after the scheduled departure date.⁶³ As a result, Yamada had to write a second letter to the Hokkaido Department Railways explaining the delayed delivery. The *Shimosa*, a new, powerful steamship, made the New York–Yokohama trip in three months rather than the conventional four,⁶⁴ and it reportedly arrived in Yokohama on 6 June.⁶⁵ This substantial increase in shipping speed was undoubtedly beneficial to trading company activities, which were in many ways a race against time. From July 1902 to June 1903, 18 steamships departed New York for Japan (48,975 tons) and 23 arrived in New York from Japan (62,121 tons).⁶⁶ The discrepancy in the number of ships departing and arriving can be explained by the long travel times, with an average of 1.7 ships per month moving between the two ports.

⁵⁶ The Draft Contract for the Supply of Foreign Goods (September 1902) from the Hokkaido Government Railways stipulates the following: 'Article 12. Compensation for late delivery shall be calculated as a proportion of the price of the good in question (n/1000) per day times the number of days from the next day of the end of the contract period to the eventual delivery date.' Hokkaido chō tetsudōbu 北海道庁鉄道部 (ed.), *Tetsudō buhō* 鉄道部報 [Report of the Railway Department], 151 (30 September 1902), pp. 1163–64.

⁵⁷ Mitsui & Co. 三井物産, *Mitsui bussan shitenchō kaigiroku Meiji 36 nen* 三井物産支店長会議録 明治 36 年 [Minutes of Branch Manager Meetings in 1903], (Tokyo, 1903), p. 20.

⁵⁸ 'A letter from Yamada to the London branch of Okura & Co. (4 January 1902)', *Tokio Letter No. 1*, pp. 462–63.

⁵⁹ 'A letter from Yamada to the Tokyo head office, overseas department (8 January 1902)', *ibid.*, p. 476. The maker had to pay the penalty if they delayed the delivery time.

⁶⁰ The *Satsuma* was an iron and steel ship with a gross tonnage of 4,204 tons, built by the British company Sunderland Shipbuilding in 1901. It ran between New York and Yokohama via the Suez Canal.

⁶¹ The *Shimosa*, built by Sunderland Shipbuilding in 1902, had a gross tonnage of 4,221 tons. Similar to the *Satsuma*, it was operated by NY&O. See 'Barber steamship lines have unique flagship', *Port of Houston Magazine* (November 1968), pp. 18–19.

⁶² 'A letter from Yamada to the Tokyo head office, overseas department (1 February 1902)', *Tokio Letter No. 2*, pp. 78–79. RG131/A1/Entry–124/ Box–856 Okura.

⁶³ 'A letter from Yamada to the Tokyo head office, overseas department (8 March 1902)', *ibid.*, pp. 212–13.

⁶⁴ The steamship *Indrasamha*, carrying axles and wheels bound for the Hokkaido Government Railways, sailed from New York on 6 November 1901 and arrived in Yokohama five months later on 14 April 1902 (*Japan Weekly Mail*, 14 December 1901 and 19 April 1902).

⁶⁵ *Japan Weekly Mail* (14 June 1902), p. 663.

⁶⁶ *Zai nyūyōku sōryōji*, 'Nyūyōku kō to nisshin ryōkoku sonota tōyō shokō tonō kōun jōko', p. 103.

Unlike Mitsui,⁶⁷ which was a general trading company able to transport freight using a combination of its own and chartered ships,⁶⁸ Okura was much smaller in size and did not possess shipping know-how. It was thus forced to rely on freight liners despite the risk of delays. At the same time, the activities of its New York branch concerning the shipment of machinery (heavy freight) were enabled by freightliners that connected New York to East Asia via the Suez Canal. Before the 1914 opening of the Panama Canal, the normal route used for shipping heavy freight from the east coast of America to East Asia—an expensive endeavour to begin with—did not take the transcontinental–transpacific route, but rather the transatlantic–Suez Canal route.⁶⁹ Regarding the latter route, new shipping companies such as NY&O⁷⁰ and the American Asiatic Steamship Co.⁷¹ were established in 1901 and 1902, respectively, resulting in additional ships and a dramatic reduction in shipping times. These freight services formed part of the infrastructure that enabled Okura’s New York branch to smoothly conduct its business.

Payment

At the time, manufacturers of railway materials in the USA received payment when the goods were loaded onto ships. Okura’s New York branch obtained the money needed for its payments from the Yokohama Specie Bank, using bills of exchange combined with letters of credit for each ordered item.⁷² Incidentally, with regard to payment for the Hokkaido Government Railways’ six locomotives (USD 60,089), it established a letter of credit⁷³ at four months after sight in advance.⁷⁴ Yamada notes that from March 1902 onward, ‘it became possible to issues letters of credit in any amount up to USD 10,000 in exchange for documentary bills for shipment from the source country (USA) and loading documents with no restriction on the number of letters issued’.⁷⁵ Based on this system, the New York branch was able to conduct bill of exchange transactions without the hassle of obtaining a letter of credit from the Tokyo head office each time, so long as the value of the transaction was less than USD 10,000.

⁶⁷ H. Oshima 大島久幸, ‘Mitsui bussan ni okeru yusō gyōmu to yōsen shijō 三井物産における輸送業務と備船市場 [Mitsui & Co.’s transportation business and the chartered vessel market in Japan]’, in *Shōhin ryutsū no kindaiishi 商品流通の近代史 [A Modern History of Goods Distribution]*, (eds.) S. Nakanishi and N. Nakamura (Tokyo, 2003), pp. 213–19.

⁶⁸ Mitsui & Co. expanded its fleet of ships in the latter 1890s after the end of the Sino-Japanese War and established a shipping department in 1903.

⁶⁹ Zai nyūyōku sōryōji, ‘Nyūyōku kō to nisshin ryōkoku sonota tōyō shokō tonō kōun jōko’, p. 103.

⁷⁰ NY&O, established by Edward J. Barber in 1901, operated its steamships between New York and East Asia. Its fleet included the newly built 4,000-ton class *Satsuma*, *Shimosa*, and *Suruga*. See ‘Barber steamship lines have unique “flagship”’, *Port of Houston Magazine*, November 1968, p. 17.

⁷¹ ‘Nichibeishi shin kōro no kaishi 日米新航路ノ開始 [Launch of a new Japan-US shipping line]’, *Tsushō isan Meiji 35 nen 通商彙纂 明治 35 年 [Collections of Trade Reports in 1902]*, 237 (1902), p. 51. The American Asiatic Steamship Co., established in New York with a capital stock of USD 500,000, had a fleet that included the newly built 8,600-ton class (registered tonnage of 3,803 tons) *Gibraltar*. It later announced that it would add new ships to its fleet and operate at a pace of one passage per month.

⁷² ‘A letter from Yamada to the Tokyo head office, overseas department (11 November 1901)’, *Tokio Letter No. 1*, pp. 295–98.

⁷³ A letter of credit (L/C) is a document a bank prepares to confirm payment for goods in an international trade transaction. At the importer’s request, the importing country’s bank (issuing bank) will guarantee the amount of the import payment to the exporter in exchange for this document if it meets specific letter of credit conditions.

⁷⁴ ‘A letter from Yamada to the Tokyo head office, overseas department (28 February 1902)’, *Tokio Letter No. 2*, pp. 167–68.

⁷⁵ ‘A letter from Yamada to the Tokyo head office, overseas department (17 [March] 1902)’, *ibid.*, pp. 220–21.

In cases in which the arrival of the official bill of exchange⁷⁶ was delayed, the branch could receive a bridge loan from the Specie Bank for any amount less than the designated credit limit. For example, with regard to the delivery of Rogers locomotives to the Hokkaido Government Railways, the official bill of exchange was delayed due to a discrepancy in the quote for transportation costs from the factory to New York and an ongoing dispute between the manufacturer and the steamship company as to which party should pay the difference. However, because Okura's New York branch and the manufacturer had agreed to 'make payment in exchange for ship receipt' so long as it had received the goods, the former was obligated to pay promptly or tarnish its reputation. Accordingly, Yamada borrowed money to pay Rogers for the four locomotives from the Specie Bank for 12 days at an interest rate of 6 per cent.⁷⁷

For transactions with the Yokohama Specie Bank as described above, Yamada kept in close contact with the New York branch manager of the bank and collected information regarding the conditions and interest rates of loans, which he reported to the Tokyo and London offices in the hopes of gaining even the slightest advantage.⁷⁸ However, the relationship between Okura's New York branch and the Yokohama Specie Bank was essentially limited to the exchange of bills. With the exception of bridge loans, there is no evidence that the bank provided direct financing for the activities of the branch. As explained earlier, funds for Yamada's office during this period were sent from London rather than being secured in New York.

The role of former *oyatoi*

The previous section examined the steps in Okura's delivery of railway goods, particularly locomotives, to the Hokkaido Government Railways. Yamada Majirō established the company's New York branch office in April 1901, won a massive contract for railway goods worth over USD 70,000 in July of the same year, and ultimately succeeded in loading goods on a ship bound for Japan by February 1902. How did Yamada, who had only arrived a few months earlier, accomplish such a large job with such a short lead time? Aside from his own exceptional ability and internal factors, including appropriate support from top managers of his firm, such as Kadono, what comes to the fore is the key external factor of Joseph U. Crawford, a consulting engineer who formerly served as a hired foreign engineer in Japan.

In 1878, Crawford was invited to Hokkaido as a civil engineering consultant by the Hokkaido Development Commission, where he immersed himself in railway construction until 1881. From 1880 to 1881, he travelled with Matsumoto Sōichirō (松本莊一郎), then an officer of the Commission (and later the director of the Railway Works Bureau), to inspect potential routes for railway lines from Tokyo to Aomori and Takasaki and to estimate construction costs, which laid the foundation for establishing the Nippon Railway Company.⁷⁹ Crawford was honourably discharged from this service during a trip home to the USA in 1881. Still, after the 1890s, he contributed to the development of Japan's railway industry as an on-site preliminary inspector of railway goods shipped from the USA to Japan.

⁷⁶ A bill of exchange (B/E) is a security in which the drawer of the bill entrusts a third party (payer) with transferring a certain amount of money to the payee of the invoice or its designee.

⁷⁷ 'A letter from Yamada to the Tokyo head office, overseas department (15 February 1902)', *Tokio Letter No. 2*, pp. 135–36.

⁷⁸ 'A letter from Yamada to the Tokyo head office, overseas department (17 [March] 1902)'.

⁷⁹ N. Nakamura 中村尚史, *Chihō kara no sangyō kakumei 地方からの産業革命 [Reconsidering Japan's Industrial Revolution from a Local Perspective]* (Nagoya, 2010), pp. 72–73.

The relationship between Okura's New York branch and Crawford began when Yamada visited Crawford at his home on 12 August 1901, seeking advice on specifications for the Hokkaido Government Railways' locomotives.⁸⁰ His concerns centred on discrepancies between the Hokkaido Government Railways' specification document and the detailed quote prepared by Rogers regarding the size of the firebox and the material properties of the track wheel centre.⁸¹ Crawford advised that the former could be resolved simply by recalculating the size using the specified area; on the latter, he observed that the cast steel advocated by Rogers was fine, as similar material had been used in locomotives manufactured by Schenectady for Kyushu Railway Company. Yamada took this advice into consideration and submitted an official order to Rogers at the end of August 1901.

To Yamada, who had just arrived in New York, Crawford's intimate knowledge of Japanese railways, technological expertise, and abundant experience in inspecting American-made locomotives and railway goods made him a reliable resource. It is for this reason that he asked Crawford to serve as a consulting engineer⁸²—a role that comprised the following four functions: inspecting and certifying purchased items; providing information on price, technical knowledge, and know-how on railway goods; evaluating technical discrepancies between specification documents and quotes; providing product information via personal connections with Japanese individuals involved in the railway industry.

Of these functions, the first entailed serving as an inspector, for which Crawford received a handling fee equal to 1 per cent of the product price. The second made him a source for knowledge on railway goods and know-how of its trade, which Yamada lacked. For example, as described earlier, regarding negotiations for a discounted price with Rogers, Crawford informed Yamada of the actual cost price of the Schenectady locomotives for Kyushu Railway that he himself had inspected.⁸³ Yamada depended on this information to know the 'market price' of railway goods. For the third function, if specification documents for railway goods needed to be changed in the manufacturing stage, Crawford would directly contact and negotiate with the source of an order to make them acknowledge the necessary changes.⁸⁴ His expertise allowed him to do this task, which would have been impossible for Yamada as a non-engineer. Finally, in regard to the last function, the relationship between Crawford and Matsumoto Sōichirō, his former colleague, is particularly noteworthy.⁸⁵ In 1900, Matsumoto, then the top official of the Imperial Government Railways (director-general of the Railway Works Bureau), visited Crawford in Philadelphia and discussed his bureau's evaluation of Rogers' locomotives. Yamada learned of this from Crawford himself, which enabled him to confirm the IGR's positive assessment of Rogers' products. Furthermore, the Hokkaido Government Railways hired Crawford as a consulting engineer in October 1901.⁸⁶ This proved extremely favourable

⁸⁰ 'A letter from Yamada to the Tokyo head office, overseas department (13 August 1901)', *Tokio Letter No.1*, pp. 21–24. Yamada would have known Crawford before this visit, given the latter's established reputation as a famous American railway engineer in Japan. However, there is no information on how Yamada could have got an appointment with Crawford.

⁸¹ The size of the firebox determines the output of the locomotive, while the track wheel centre, which bears heavy loads, requires a material with high strength and durability.

⁸² Crawford had become a consulting engineer for Okura & Co. by 5 September 1901, at the latest. 'A letter from Yamada to the Tokyo head office, overseas department (5 September 1901)', *Tokio Letter No. 1*, pp. 115–16.

⁸³ 'A letter from Yamada to the Tokyo head office, overseas department (22 August 1901)'.

⁸⁴ 'A letter from Yamada to London branch office (5 September 1901)'.

⁸⁵ 'A letter from Yamada to the Tokyo head office, overseas department (5 November 1901)', *Tokio Letter No. 1*, pp. 284–86.

⁸⁶ 'A letter from Yamada to the Tokyo head office, overseas department (17 October 1901)', *ibid.*, pp. 228–31. From then on, Crawford became a consulting engineer for both Okura and the Hokkaido government.

to Okura's New York branch in terms of its activities and information gathering. Yamada's effective use of Crawford as a consulting engineer thus enabled him to purchase railway materials despite his newcomer status.

Conclusion: acquiring knowledge and know-how in the locomotive trade

The above analysis has investigated the process of acquiring knowledge and know-how in American branch offices of Japanese trading companies through the case of Yamada Majirō, the first manager at Okura's New York branch office. Okura's purchase of locomotives for the Hokkaido Government Railways benefited from Rogers' timely resumption of manufacturing after the latter's temporary suspension of operations, but there is no denying that Yamada's wide-ranging personal network allowed its New York branch to capitalise on this opportunity despite being newly opened.

Detailed examination of Yamada's thoughts and actions reveals his ability to acquire trading know-how and utilise business opportunities by collecting relevant and accurate information through a network that included Japanese companies, the consul in New York, local experts such as journalists for industrial magazines, consulting engineers, as well as Japanese businesspeople and engineers visiting New York temporarily.⁸⁷ In particular, being in attendance with multiple Japanese businessmen in New York for work provided him with important information and knowledge. It is likely that many mid-sized trading companies accumulated know-how on overseas trade in a similar fashion. Furthermore, the expansion of Japanese trading companies' overseas branch networks in around 1900 facilitated Japanese manufacturers' smooth procurement of machinery and materials worldwide. In this sense, the growth of trading companies became a significant part of the social infrastructure that supported Japan's industrialisation.

In closing, the critical role played by *oyatoi* as consulting engineers cannot be underestimated. For Okura's New York office, their successful procurement of a large account despite just having been established hinged on Yamada's hiring of Crawford and the latter's advice in various steps of the transaction. Crawford had the ability not only to inspect parts, but also to provide technical knowledge along with information on American railway goods manufacturers and Japanese railway companies, which compensated for Yamada's lack of know-how. Without Crawford, the successful delivery of railway goods to the Hokkaido Government Railways would not have been possible. Examples of former *oyatoi* engineers becoming consulting engineers or inspectors for Japanese trading companies after returning to their home countries also appeared in the UK.⁸⁸ As well as railways, there were also examples in other industries in which former *oyatoi* played a significant role in Japan's industrialisation even after return to their home countries.⁸⁹ In shipbuilding, for example, Albert R. Brown played an essential role in building Japan's first large steamship, the *Hitachi Maru* (常陸丸), in 1898.⁹⁰ Brown, a British captain and inspector of shipbuilding, was hired by the Meiji government from 1869 to 1885, then transferred to the Nippon Yusen Kaisha (NYK). After retiring from the NYK in 1889, he

⁸⁷ These Japanese businessmen were mainly significant customers for Okura, including Uemura Chōzaburō 植村澄三郎 (managing director of Sapporo Beer) and Utsunomiya Kanichi 宇都宮貫一 (driving division head of the IGR).

⁸⁸ Illustrated by the case of Thomas R. Shervinton, who served as a chief engineer for the Railway Bureau from 1877 to 1881. See Nakamura, *Umi wo wataru kikansha*, chapter 3.

⁸⁹ O. Checkland, *Britain's Encounter with Meiji Japan, 1868-1912* (Basingstoke, 1989), chapter 12.

⁹⁰ Building the *Hitachi Maru* was one of the landmarks of independence of the Japanese shipbuilding industry and essential evidence of the progress of the industrial revolution in Japan. See Y. Inoue 井上洋一郎, *Nihon kindai zosengyō no tenkai* 日本近代造船業の展開 [*Development of the Modern Japan's Shipbuilding Industry*] (Kyoto, 1990), pp. 122–27.

returned to Scotland and established a trading company, A. R. Brown McFarlane & Co., in Glasgow. When the Mitsubishi Nagasaki Shipyard built the *Hitachi Maru* by introducing technology from the UK, Brown acted as an intermediary in the selection of consulting engineers, procurement of materials, and purchase of blueprints.⁹¹

Engineers and other former *oyatoi*, in various roles, supported the overseas activities of Japanese trading companies and formed an essential route of knowledge transfer in cross-regional commercial management. The hired foreigner system, adopted to transfer modern technology to Japan, continued to link Japan and overseas countries even after Japan had achieved technological independence. In sum, the role of former *oyatoi* in Japan's industrialisation was significant not only in the early Meiji period, which has been the focus of previous research, but also during Japan's industrial revolution.

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⁹¹ M. Kita 北政巳, *Kokusai Nihon wo hiraita hitobito 国際日本を拓いた人々 [People Who Pioneered International Japan]* (Tokyo, 1984), chapter 7; and T. Nakaoka 中岡哲郎, *Nihon kindai gijutsu no keisei 日本近代技術の形成 [Formation of Modern Technology in Japan]* (Tokyo, 2006), pp. 395–404.

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