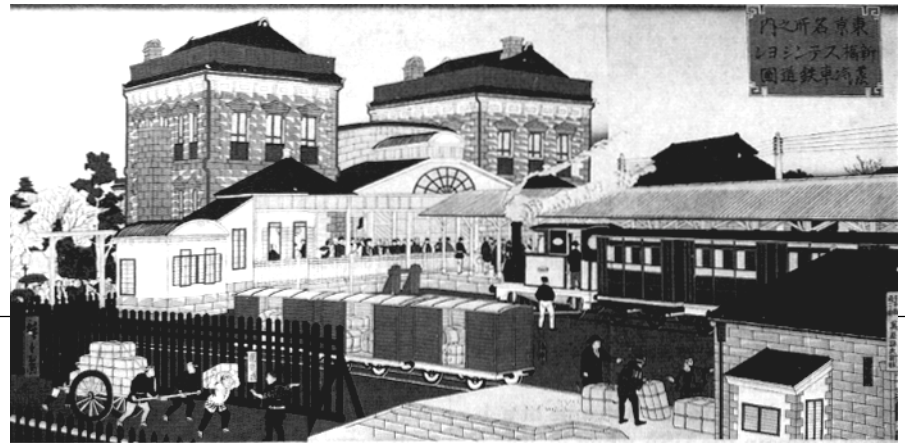


Dawn of Japanese Railways

Eiichi Aoki

■ Shimbashi Station, from a woodprint
 Courtesy : Transportation Museum, Tokyo



Railway construction plan and its social background

The ruling Tokugawa *Shogunate*, which had kept Japan in international isolation for 260 years, was replaced by the Meiji government in 1868. This marked the beginning of Japan's modernization with the new government ending feudalism and introducing Western ideas.

Nationwide distribution systems already existed in the Edo period. Long-distance transportation over hundreds or thousands of kilometers was nothing new. People were sending rice from the Tohoku and Hokuriku regions to Edo (now Tokyo) and Osaka. Fish-meal fertilizers were being sent from Hokkaido to regions along the Inland Sea. The main means of transport at that time was shipping. The key routes were formed by navigation along the coast and rivers.

By contrast, road transport was primitive. Commodities were carried by men and horses because there were no carriages. Unlike in the West, there was a world of difference between sea and road transport in Japan. Large rivers were obstacles to road traffic because there were no bridges.

Construction of railways, particularly between Tokyo and Yokohama, and Osaka and Kobe, was suggested several times by foreigners and some Japanese prior to the Meiji government. Their advocates proposed railways between ports and large cities but such plans never bore fruit due to the fall of the *Shogunate*. If they had been

implemented, foreigners might have won railway rights in Japan.

In 1869, Harry Parkes, the British Minister to Japan, advocated that railways would help modernize Japan insisting that the government build them as soon as possible. 1869 was another poor year for the rice harvest in Tohoku and Parkes explained that railways could carry rice quickly from other areas to Tohoku thereby minimizing the effects of famine. The Meiji government agreed to build railways for political reasons, to put an end to feudalism and centralise power in Japan.

Tokyo-Yokohama Railway

On 7 December 1869, Harry Parkes met the heads of the Meiji government to discuss basic measures for introducing railways and telegrams in Japan. The Japanese leaders at the discussion included Tomomi Iwakura (Vice Premier), Nobuyoshi Sawa (Minister of Foreign Affairs), Shigenobu Okuma (Vice Minister of Finance), and Hirobumi Ito (Assistant Vice Minister of Finance). Okuma and Ito later took charge of building railways. During the discussion, it was decided to build the first line between Tokyo and Kobe. It was also decided to build a branch from an appropriate location near Lake Biwa to Tsuruga, a town on the Sea of Japan.

Funds were to be procured by Horatio

Nelson Lay, an Englishman introduced to the Meiji government by Parkes. Lay sold railway bonds in London. He began hiring British engineers to design and build railways in Japan. He also began purchasing the necessary equipment for the Meiji government.

Lay had signed a loan contract with the Japanese government at an annual interest rate of 12% and a 10-year term of payment. However, he began selling railway bonds in London at an annual rate of 9% with an issue price of 98% of the face value. In other words, Lay intended to earn a 3% margin from every bond he sold. This led to distrust and the Japanese government consulted the head of the Yokohama branch of the Oriental Bank (a British bank) with the result that the government terminated the contract with Lay, and appointed the bank as its representative in London.

It was decided to build the country's first railway over the 29-km distance between Tokyo, Japan's capital, and Yokohama, one of the few ports open for international trade at that time. The preliminary survey work began on 25 April 1870. The terminal in Tokyo was to be built at Shimbashi and the terminal in Yokohama at Noge Kaigan. These two places were chosen because they were close to the city sections and the foreign settlements. The trains were to run on the 3' 6" (1,067 mm) gauge tracks used in many British colo-



■ A tank locomotive, built by Sharp Stewart & Co., at Shimbashi Station. *Courtesy: Transportation Museum, Tokyo*

nies at that time.

The railway construction was never entirely free of opposition during the first years of the new government. The major opposition came from the military which put priority on armaments and isolationism. Isolationism was quite common among Japanese people who feared the railway being built by foreign engineers as a strange foreign tool.

The first shipment of ten tank locomotives and 58 two-axle passenger carriages from Britain arrived in Yokohama in September 1871. On 12 June 1872, two daily train services started between Shinagawa and Yokohama, marking the start of regular passenger trains in Japan. Six daily services began two days later. The two trains going in opposite directions passed on sidetracks at Kawasaki. Services between Shimbashi and Shinagawa were delayed until October because the military would not allow tracks on their land facing Tokyo Bay. The railway advocates had to build a new embankment for the tracks.

The Meiji Emperor attended the opening ceremony on 14 October 1872 at Shimbashi and Yokohama stations making a round-trip passenger on the train between the two terminals. The number of daily round-trip services was increased to nine the following day. There were four stations on the line: Shinagawa, Kawasaki, Tsurumi, and Kanagawa. It took 35 minutes from one terminal to the other. Freight services started on 15 September 1873.

The original Shimbashi Station was renamed Shiodome Station and became a freight yard when a new terminal (To-

kyo Central) was opened in 1914 near the Imperial Palace. Shiodome was closed recently and awaits urban redevelopment. The original Yokohama Station is now called Sakuragicho; the surrounding area also awaits redevelopment.

The original railway between Shimbashi and Yokohama was under direct management of the government. In August 1871, it was put under control of the Ministry of Public Works, whose major role was introducing Western technology.

Masaru Inoue, the first Director of Railways in Japan, studied railway and mining at University College, London.

Expansion of railway network

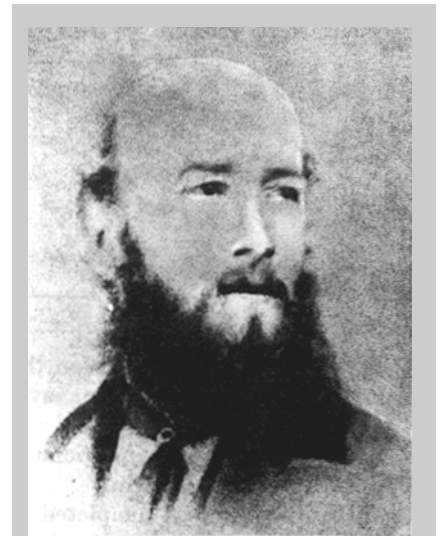
On 25 August 1870, just 4 months after surveying began for the Shimbashi to Yokohama section, surveying work began between Osaka and Kobe. Regular service started on 11 May 1874. The first wrought-iron bridge and tunnel in Japan (running under a raised-bed river) were built in this section. The line was later extended to Kyoto in 1876 and to Otsu in 1880. This section included the Osakayama Tunnel (646m long), Japan's first mountain tunnel and the first tunnel to be designed and built by Japanese engineers.

The Japanese government was suffering from a financial crisis at the time. The major cause was rapid introduction of Western technologies (construction of government-run plants and factories) and compensation for people deprived of feudal privileges. Riots started by former samurai occurred in Western Japan between 1874 and

1877. The government had to issue enormous amounts of inconvertible notes to quell the riots. This led to inflation.

In 1880, Finance Minister Masayoshi Matsukata took on a curtailment policy and started selling government-run plants and factories to the private sector. Railway construction was slowed for the same reason. He also approved privately-owned railway operations.

In 1881, Nippon Railway was authorized to run between Tokyo and Tohoku, and the first private service



Courtesy: Transportation Museum, Tokyo

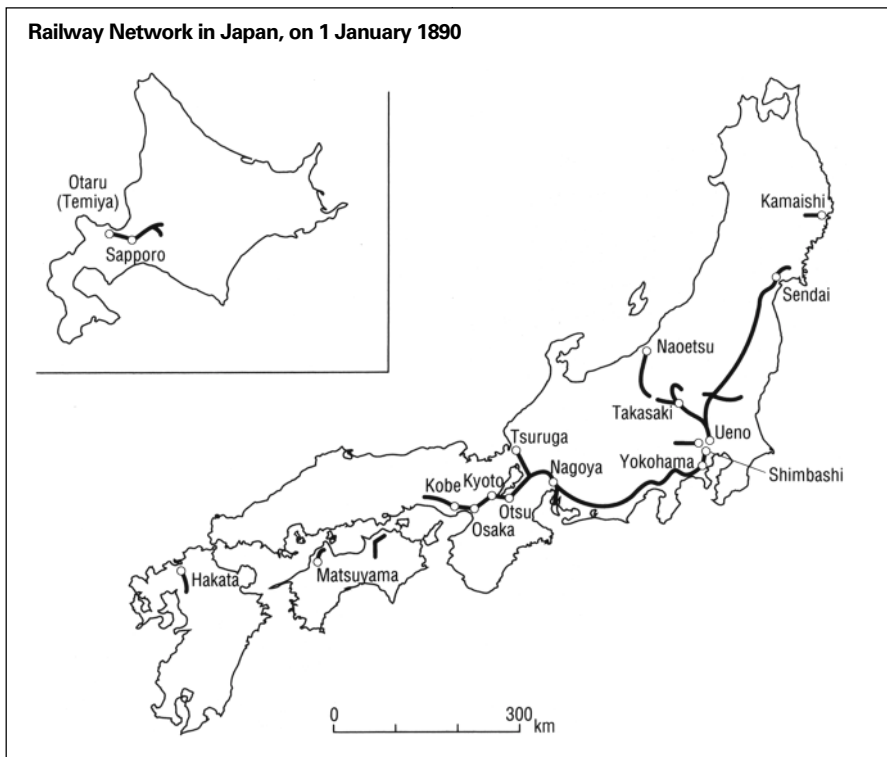
Edmund Morel (1841-1871)

After studying civil engineering at King's College, London, Edmund Morel was engaged in railway construction in many countries including New Zealand and Australia. In April 1870, he was hired by the Japanese government as first Engineer-in-Chief. His role included guiding and supervising railway construction as well as screening engineers and providing advice about inspection of foreign equipment and instruments arriving in Japan.

Morel's most important contribution during his short assignment in Japan was making significant proposals to the Japanese government regarding engineering administration and education. The government established the Ministry of Public Works in December 1870 on his advice. The new ministry's function was integrating introduction of foreign technologies and their application. The Engineering College (predecessor of Tokyo Imperial Technical University) was established in April of the following year to educate key engineers.

Morel was later taken ill and the Japanese government suggested transferring him to India to cure his tuberculosis. But his physical condition prevented him from making the long journey and he died on 5 November 1871. His Japanese wife was also infected by tuberculosis while caring for her dying husband. She died just half a day after him. Their tombs in Yokohama are designated a national railway memorial.

Railway Network in Japan, on 1 January 1890



learn civil engineering and other skills. A British Engineer-in-Chief, T. R. Shervinton was appointed master instructor. Twenty-four students had graduated by the time the school closed in 1882. These graduates were engaged in building the railway between Kyoto and Otsu beginning in 1878. When the work was completed, they assumed key posts in designing and building new railways in other parts of the country.

By 1880, there were enough capable Japanese engineers to replace foreigners in most key posts except in designing steam locomotives and bridges where foreigners continued the design work until the 1890s. They included Richard Francis Trevithick and his brother Francis Henry Trevithick, grandsons of Richard Trevithick the inventor of the steam engine. They were both locomotive engineers, and were hired by the Japanese government from 1888 to 1904 and from 1876 to 1897, respectively. They made a large contribution by guiding and supervising the design and manufacture of locomotives.

Many of the British engineers in the key posts were devoted to learning and very dedicated to their duties. They wrote many articles about Japanese railways in technical periodicals in Britain. ■

began in 1883 between Ueno (on the north side of Tokyo) and Kumagaya. By 1891, the company had completed its line between Ueno and Aomori through northeastern Honshu.

Another railway was completed in 1882 in Hokkaido. Its primary objective was shipping coal from the Horonai coal mine to the port of Otaru (Temiya Station). This railway was designed and built under the guidance of American engineers. The locomotives and most other equipment were imported from the United States.

A mining railway was completed in 1880 to transport iron ore to the Kamaishi Iron Mill on 2' 9" (838 mm) narrow-gauge tracks.

Contributions by foreign engineers

A large number of British engineers were hired by the Japanese government in the early stage of Japanese railways. Their specialities ranged from civil engineering and machinery for manufacturing and repairing rolling stock, to scheduling train services and operations. Nearly 300 foreigners in total (mostly British) were also hired for various posts. Their jobs in-

cluded directors, engineers-in-chief, locomotive superintendents, traffic managers and other key posts, as well as mechanics, masons, plasterers, carpenters, engine drivers, track maintenance and other field workers. They were excellent teachers and skilled workers and were essential to the railway construction and management.

Hiring of foreigners for railways began in 1870. The number rose to 119 in June 1874, but fell afterwards especially when the curtailment policy was put into effect in 1881. During those years, foreign engineers taught basic techniques and valuable know-how to their Japanese counterparts. They also made special efforts to educate key railway engineers in Japan.

In May 1877, the Engineer Training College was opened at Osaka Station. Young Japanese who passed the entrance examination were admitted to



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After graduating from the Faculty of Science at Chiba University in 1957, Mr. Aoki received a doctorate in science from the Tokyo University of Education (now called Tsukuba University). After serving at Tsuru City University and Tokyo Gakugei University as an assistant professor, he became a professor at Tokyo Gakugei University in 1978. He specialises in transportation geography and is also a leading Japanese scholar of the history of railways and marine transportation. Mr. Aoki is now president of the Japan Railway History Society. His publications include *World History of Sea Power and Japanese Railway—Its Rise and Development*.