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## The Development of the Information and Communication Systems in Germany and Japan up to the End of the Nineteenth Century

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# The Development of the Information and Communication Systems in Germany and Japan up to the End of the Nineteenth Century

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## 1. GERMANY BEFORE THE MODERN ERA

In the European Middle Ages, the communications system of the ancient Greco-Roman times was in decline. Many achievements of the Roman Empire, such as its network of tarmac roads and well-organized messenger services that worked with horse relay stations, had disappeared or fallen into disrepair. They were not rediscovered by later Europeans until the time of the Crusades, when the European armies came into contact with Islamic culture, which had maintained many classical-era practices such as carrier pigeon post and mounted courier services. Finally, Italian merchants from the late Middle Ages were the first to re-establish regularly operating messenger lines and to extend their communications network into the northwest of Europe.

In Germany, writing entered many aspects of life around the year 1400, as a result of a shift of the literary language from Latin into German and the use of paper instead of the (very expensive) parchment. However, until the end of the fifteenth century, the messenger and postal services of, for example, the Hanseatic League and the Teutonic Order still relied almost exclusively on runners because an organized system of horse relay stations did not exist. The speed of these runners was impressive and could exceed 33 kilometers per day; for example, a runner could connect the ends of the Hanseatic League, the 2,000 kilometers from Bruges to Riga, in two months. From the end of the fifteenth century until the mid-seventeenth century in Central Europe, there were mainly mounted post connections equipped with postal stations (horse relay stations), which reached speeds of 84 kilometers per day; for example, the 422 kilometers between Cologne and Hamburg could be covered in five days. The quickest mounted post

connections reached a speed of up to 280 km per day; thus the furthest mounted connection, the 1,555 kilometers between Berlin and St. Petersburg, could be done within 129 hours.

From about 1650 onwards, mail-coaches were increasingly used for the transportation of letters, packages and persons. The mail-coaches reached the peak of development and use in about 1840 and were replaced by the emerging railways in the 1850s. Their speed was between 8 km/h and 12.7 km/h (the latter being the express mail-coaches on tarmac roads). But the distance they covered per day could not have ranged far beyond 100 kilometers because of border controls (even within Germany), provision of meals to the passengers and the like. Until well into the nineteenth century mounted messengers operated in addition to the mail-coaches because of their greater speed. Hence, before the introduction of the railway we find no technical progress from the ancient Greco-Roman times, since, even in the ancient Persian Empire, the speed of news transmission amounted to about 250 kilometers per day and in the Roman Empire to about 300 kilometers per day.

Not only in a technical sense but also in terms of organization it took a long time to approximate to the standards of the ancient world. Until well into the seventeenth century, the postal system in Germany consisted of rather unorganized connections between the messenger services of towns and monasteries, universities, orders of knighthood, guilds and merchants, monarchs and bishops. Some organizational integration occurred in 1615, when the princely house of *Thurn und Taxis* was entrusted with the postal services by means of a heritable enfeoffment by the Emperor. But very soon after the foundation of the so-called Imperial Post (*Kaiserliche Post*) under the leadership of Thurn und Taxis, a dualism emerged between the postal systems in the south and the north of the German Reich, which was to shape German postal history for the following 200 years or more. Starting with the establishment of the so-called *Schwedenpost* during the Thirty Years' War (1618–1648), which guaranteed the postal independence of the Protestant north of Germany, continuing through the State Postal Service of Prussia (*Preußische Landespost*) up to the Northern German Postal Union (*Norddeutsche Postunion*). Thurn und Taxis always found itself faced with a strong competitor in the north. During the seventeenth and eighteenth centuries, the relations between the two postal systems repeatedly switched between co-operation and hostility. After the Congress of Vienna in 1815 and the foundation of the German Union (*Deutscher Bund*), Thurn und Taxis was able to maintain its postal position in many parts of the country despite the loss of the imperial enfeoffment by the end of the old Reich (*Altes Reich*)—this time mainly in the form of enfeoffments by local kings or dukes.

So the inherited dualism persisted. However, within it, the northern section, represented primarily by the postal service of Prussia, tended more towards innovations, such as the development of the so-called optical telegraphy, which connected Berlin and Koblenz from 1835. It was mainly thanks to this dualism, that, despite some reform efforts that built on the British postal reforms of 1840, in

contrast to the German tariff union (*Zollverein*) founded in 1834, postal reunification was only achieved after 1851 through the agreement on the postal union (*Postvereinsverträge*). The final form of this agreement was signed on 2 March 1866, only few months before the beginning of the reunification war, during which Prussian troops occupied the head office of Thurn und Taxis in Frankfurt, and in Prussia. The agreement thus overcame the fragmentation of the postal system in Germany by force. This fragmentation had been responsible for the delayed development of a modern communications system in Germany.

## 2. JAPAN BEFORE THE MODERN ERA

The origins of a regular transmission of news in Japan date from the year 646, when, in the course of the Chinese-inspired Taika reforms (*Taika no Kaishin*), the Japanese government established mounted courier services, which probably already operated with horse relay stations (*shukueki*). After the decay of this first governmental constitution of Japan, the Kamakura shogunate (1185–1333) again set up a mounted postal service, which for example enabled the all-important connections between Kamakura and Kyoto within five to seven days. As postal stations with capacity to exchange horses were provided (probably) by the lords of *shōen* or by *gokenin*, nonstop couriers were able to deliver messages at a speed of about 170 kilometers per day. Already in the Kamakura period we find the foot messengers (*hikyaku*) who were later to become so common in the Edo period. Mail-coaches did not, however, become established in Japan, because the condition of roads and bridges did not allow it.

With the political reunification of the country in the Edo period (1600–1867) traffic and postal activities intensified considerably. The amount of transmission and transportation services increased enormously, while the technical equipment remained the same as during the Middle Ages; that is, the majority of the connections were by hikyaku-runners. Express transmission services—namely, using runners who shuttled letters and goods between two postal stations day and night—could achieve as much as 200 kilometers per day. However, the average speed of services operated by hikyaku-runners was between 125 kilometers and 150 kilometers per day; for example, the long-distance 1,000-kilometer connection from Nagasaki to Yokohama required eight days. There was also mounted messenger (*kiba shisha*) service in the Edo period, but because of the very occasional horse-relay stations, they could not cover much beyond 170 kilometers per day. On the other hand, carrier-borne passenger litters (so-called *hayauchi kago*, or fast litters), whose carriers were exchanged at each postal station, could reach distances of up to 148 kilometers per day.

The hikyaku services of the Edo period were, at first, purely state-run organizations that had to support the administrative concerns of the central government (*Bakufu*). Apart from the delivery of official documents and letters between the Bakufu and its administrative outlets throughout the country, as well

as between the Bakufu and the different feudal domains (*han*), the *hikyaku* services also transported private mail, but at extraordinarily high prices. Soon private postal enterprises developed in the cities of Edo, Osaka and Kyoto; these businesses were the so-called *hikyaku don'ya*, and they established their own merchant guilds (*nakama*) from 1668. These businesses paid fees to use the Bakufu's system of postal stations and, on occasion, official messengers. However, in the early eighteenth century they started establishing private express postal lines using their own horse relay stations; with these, they could reduce the transmission time between Edo and Kyoto to three-and-a-half or four days. In 1743, the Bakufu prohibited this fast private service, which operated exclusively with its own mounted couriers, and with that, the potential for further improvement of the whole system was lost.

An efficient information system developed around the Dōjima rice market in Osaka. Because in the south and west of Japan the price of rice fluctuated widely, the Dōjima merchants built up a communication network consisting of so-called *kome-bikyaku*, messengers whose task was to report to Osaka the current local prices of rice. During the entire Edo period, postal connections between the major cities and towns were organized on a similar basis to the circumstances in Europe at the time, but the delivery of mail in the rural areas remained difficult and sporadic.

Finally, it is worth mentioning one communication system that functioned in a very similar manner to optical telegraphy in Prussia: the *tebata-shingō* system, which was introduced in the region around Osaka in the mid-eighteenth century. This system involved signals being transmitted during the day with black and white flags of different sizes and by paper lanterns and large mirrors during the night hours. This news system was exclusively operated by private firms. Despite its prohibition by the Bakufu in 1775, it spread throughout the region around Osaka and continued even into the twentieth century, when it was replaced by the telephone.

In sum, with the exception of the *tebata-shingō* system, information and communication systems remained at a very low technical and organizational level in both Japan and Germany in the era before the establishment of the modern nation state. The only exception for Germany was the early transportation of mail by rail after the 1830s. Indeed levels of information and communication systems fell well short of the transmission standards that had been enjoyed by the classical Greco-Roman civilizations.

### 3. GERMANY IN THE SECOND HALF OF THE NINETEENTH CENTURY

The development of postal services in the German Reich from 1866 until the end of the century was marked by the great reformer of the German postal system, Heinrich Stephan (1831–1897). Stephan rose to the position of High Secretary within the general postal administration of Prussia in Berlin in the late 1850s. In 1866, he was sent to Frankfurt to supervise the break-up of the Thurn und Taxis

post, and he was also in charge of the ensuing unification of the postal system in Germany. In 1872 the Grand Duchy of Baden agreed to join the German postal union, the *Deutsche Reichspost*. Thereafter, only three postal administrations existed within the territory of the Reich: the Deutsche Reichspost and the postal services of Bavaria and Württemberg. This tripartite division persisted until 1920, mainly because Bavaria held on to its postal independence.

Stephan contributed much to international activities such as the foundation of the Universal Postal Union in the autumn of 1874 in Bern (Switzerland). Then, on 1 January 1876, he oversaw the unification of the postal and telegraph administrations of the Reich under his leadership. Since the telegraph system had been under the auspices of the military, this meant that control of the new structure shifted into the civilian—and by definition, public domain and that the post offices could be equipped with telegraphs for public use. The brisk expansion of telegraph services through all parts of the Reich was strongly promoted by the fact that a powerful center of the electro-technical industry took shape in Berlin around the companies of Siemens and AEG.

Stephan also introduced and promoted the telephone. Telephone service began in 1880 connecting only eight subscribers, and at first it was restricted to a 60-kilometer radius around the city of Berlin. Although the telephone was initially received by the public with reluctance, it spread very fast throughout the country in the late 1880s and in the 1890s. Stephan believed strongly that in Germany—unlike many other countries—telephone services should be a state-run institution, and he rejected applications by firms to establish private networks.

During this period, Germany's international postal connections depended heavily on foreign shipping lines. Given the nationalistic and imperialist mood of the time, Stephan's demands for the construction of German mail-steamers and the establishment of independent shipping lines met with strong enthusiasm. In 1886 the first German mail-steamer *Oder* was launched and was used chiefly on the first German mail-steamer route from Bremen to Yokohama. Over the next decade or so, several German shipping lines emerged, primarily aiming to serve the new German colonies in Africa and Micronesia as well as to regions of German emigration.

After Stephan's death in 1897 German postal policies continued the fast pace of technical modernization represented by, for example, the introduction of stamp machines and other office machines into the post offices as well as vending machines for the sale of postage stamps and postcards in or around 1900 and the first postal lines run by automobiles in 1905. On the other hand we find strong influences of the contemporary German economic thinking which centered on a very active role for the state. Nevertheless it has hardly been recognized that private courier services, too, persisted until the very end of the nineteenth century, mainly operating inside the large towns. They survived because of their cheap local tariffs. But the reduction of the local tariffs of the *Deutsche Reichspost* in 1900 caused the last of these private enterprises in the postal system of Germany to disappear.

#### 4. JAPAN IN THE SECOND HALF OF THE NINETEENTH CENTURY

In Japan, too, the establishment of a modern state-run postal system was promoted by a brilliant top bureaucrat, Maejima Hisoka (1835–1919). Maejima promoted a plan for the construction of a modern state-run postal organization that would be based on a European model. In order to investigate the advantages and disadvantages of the different postal administrations in the Western countries, Maejima was sent by the government on a study tour through Europe and North America. During the tour, Maejima paid special attention to the British postal system, which was widely reputed to be the most advanced in the world. In the spring of 1871, under the supervision of Maejima, the Japanese state-run postal service was founded. The first service was limited to connecting Tokyo and the Kansai region of Osaka, Kobe, and Kyoto. In 1872, Maejima extended the postal services to a national scale, and the next year, he enforced a state monopoly on postal services, eliminating the private postal services that had been operating since the mid-Edo period. This allowed him to standardize postal tariffs and issue universally valid stamps in 1873. Thus, by 1874, a national Japanese postal system replaced the hitherto existing, complicated distance-orientated tariff system with universal tariffs calculated by weight. In the early years Maejima had already been well aware of the importance of international ties and signed a postal agreement with America in 1874. From 1 June 1877 Japan also joined the Universal Postal Union.

As in Germany during the first decades after the foundation of her modern state-run postal system, Japan suffered from a strong dependence on foreign shipping lines for its international postal connections. In the 1870s, though, the Mitsubishi company established mail-steamer lines to Shanghai, Korea, and Vladivostok, and by the 1890s, NYK (*Nihon Yūsengaiisha*, or the Japan Mail-Steamer Company), an enterprise belonging to the Mitsubishi group, was successfully operating on all routes important for Japan and competing efficiently against the American and European lines in Eastern Asia.

As in Germany and many other countries, the telegraph in Japan was first promoted by the military. As early as 1869 the first telegraph connections were run between Tokyo and Yokohama. In the following years the telegraph network was rapidly extended, aided by the 1872 law for integrating state-run and private telegraph lines. The first long-distance connection, between Tokyo and Aomori, was completed in 1873. Submarine cables of the Great Northern Telegraph Company had already connected Nagasaki with Vladivostok and Shanghai as part of a line from Europe through Russia and China to Japan from 1871. Furthermore, crucial domestic submarine connections to the islands of Kyūshū, Shikoku and Hokkaidō were soon completed by British engineers; in 1879, Japan belonged to the nations that signed the Universal Telegraph Union treaty. In the same year more than 20,000 international telegrams were sent from Japan. This number rose to 290,000 by the year 1902. Domestic telegrams rose from 1.2 million

in 1879 up to more than 17 million in 1902. In 1886—ten years later than in Germany—the postal and telegraph administrations were merged.

Despite the civil management of the telegraph system that this effected, the telegraph remained centrally important to the military, especially during the Sino-Japanese War (1894–1895) and the Russo-Japanese War (1904–1905). The telephone, which was invented in 1876 by Alexander Graham Bell, was introduced to Japan as early as 1877, but, in the early years, it was only used for government communication between offices in Tokyo and Yokohama. In public debate about how to expand telephone use by the general public, there was much controversy as to whether the network should be operated by private firms or by the state. As in Germany, the government favored a state monopoly. In December 1890 a public telephone service was inaugurated, although with only a small number of private users. After the Sino-Japanese War, the government launched a program to extend the telephone system all over the country. Its planned target was achieved in 1903, the year when all major cities and towns had been incorporated into the telephone network and the number of connections had risen to 35,000.

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