MEIJI ISHIN: RESTORATION AND REVOLUTION

Edited by Nagai Michio and Miguel Urrutia

THE UNITED NATIONS UNIVERSITY
Major social transformations took place in non-European societies, such as those of Japan, China, Russia, and Mexico, during the last century. The UNU Project on Comparative Studies of Social Transformation looks into the interactions between different social, economic, political, cultural, and international environmental factors at work in these transformations and attempts to generate a new and synthetic conceptualization of such interrelationships. *Meiji Ishin*, the outcome of an international conference, is an examination of an important event in Japanese history from different theoretical standpoints by specialists from Japan, China, the Soviet Union, and the United States. The second volume of the Series on Social Transformation, now under preparation, will deal with the Mexican Revolution.

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The abolition of the *bakuhan* system, relatively quickly and without large-scale rebellions, helped to limit the danger of colonization (Japan had already been placed in a subordinate position by the unequal treaties). Rapid suppression of the Boshin War (1868–1869) also curtailed the expansion of popular struggle. After this, the bureaucrats of the new government seized the initiative in the effort to achieve independence and modernization. As a result, the Meiji government’s top priorities were to strengthen a system of control dominated by the emperor, peerage (nobility and former daimyo), and bureaucrats and to modernize Japan’s defences. Changes in the feudal relationships that underlay society and improvement of the living conditions of the masses were sacrificed. Although the peasants’ right to own land was recognized, they had to pay the same heavy land tax and local taxes as during the Tokugawa era. The freedom and popular rights movement was a reaction to the new exploitation, but it suffered a swift demise.

The movement failed to achieve its major objectives: (1) to strengthen the economic power of producers, expand domestic markets and shape capitalism to its benefit; (2) to reform bureaucratic absolutism and check nascent militarism by public opinion; and (3) to stimulate a democratic and modern popular consciousness. As the Western powers began adopting imperialist approaches in the 1880s, radical popular movements for democracy had little chance of success.

The government’s modernization policy linked with militarism became more or less successful in the 1890s, providing the base from which Japan grew into an imperialist country. The Western powers needed an imperialistic Japan to tighten their own hold on Asia. China, Korea and other parts of Asia, for example, had started to modernize, but their efforts were forestalled by the tough colonial policies of the West and Japan. Asia and Japan were now set on different, antagonistic courses.

MEIJI ISHIN: UNACCOMPLISHED BOURGEOIS REVOLUTION

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It is quite evident that no other events in the history of Japan arouse as much dissension among Japanese and foreign scholars as the revolutionary developments of the late 1860s and early 1870s, in Japanese the “Meiji Ishin” and in English the “Meiji Restoration.” Soviet japanologists actively participate in this dispute. Eminent Soviet scholars including E. M. Zhukov, H. T. Eidus, A. L. Galperin, P. P. Topeha, A. J. Fineberg and many others have given close attention to the Meiji Ishin in their writings. I shall call this period the Meiji Ishin for the sake of brevity although I usually classify this period using terminology of a different sort. In 1968 the Institute of Oriental Studies of the Academy of Sciences of the USSR convened a conference of Soviet japanologists in commemoration of the centennial of the Meiji Ishin, and heated discussions were held on the historical significance of the events at that time. Twenty-five leading experts in Japanese history, culture, and the economy presented reports and polemical speeches.

A number of Russian translations of books on the Meiji Ishin by foreign authors, including the work of Professor Töyama Shigeki and *Japan: Emergence as a Modern State*, by the Canadian japanologist Herbert Norman, have been published in the Soviet Union. It is a topic that arouses ever-growing interest these days. Soviet journals continue to publish articles on this theme. Our scholars pay special attention to works on the Meiji Ishin by Japanese historians as well as to their scientific discussions on this theme. Last year, the USSR Academy of Sciences Japan Section held a conference on the ten-volume *History of Japan* written by professors of the universities of Tokyo and Kyoto. Nauka Publishing House will publish a work by N. F. Leshchenko, research fellow of the Japan Section of our institute, under the title *The Meiji Ishin in the Works of Progressive Japanese Historians*; this covers in detail
the concepts of both the Rōnōha and its rival, the Kōzaha. In their studies Soviet japanologists rely not only on the works of Marxist historians but also on those of our ideological opponents, particularly those from the US, who regard Japanese history from the viewpoint of the so-called theory of modernization. In our studies we have in mind certain practical tasks: during the forthcoming five-year period a group of japanologists from the Institute of Oriental Studies will prepare a multi-volume history of Japan, referring to the most valuable works by their foreign colleagues.

Here I would like to introduce the views of Soviet japanologists with regard to various problems concerning the Meiji Ishin. The first problem is connected with the real historical nature of the Meiji Ishin. Most Soviet japanologists regard it not as a mere coup d’état, but as a people’s revolution which wrought great changes in Japan’s development. On this point our views differ substantially from those of Japanese historians, who support the semi-official and conservative trend, and see in the Meiji Ishin only a monarchist overturn of power through which the Japanese emperor restored his state authority, lost some time before, and “granted” his people the blessings of modern civilization. We are also far from agreeing with US scholars — supporters of the theory of “modernization” — who deny the revolutionary nature of the events of 1867–1868, and their historical reciprocity and class propinquity with such world events as the British Bourgeois Revolution of 1640–1660, the Great French Revolution of the end of the eighteenth century, and the German Revolution of the middle of the nineteenth century. We cannot agree with the modernization theory because it quite arbitrarily sets up the capitalist countries and bourgeois cultures of the Western world as the standard for world progress. As a result, the adherents of that theory measure the degree of Japanese modernization by the norms and standards of material and cultural life in the Western capitalist states. That theory disparages other types of economic development, and the state or cultural systems of other countries — in particular the ways of development of socialist countries — as “out of date” or even “anomalous.” The unreasonableness of this approach is quite evident. It seems to me that our American colleagues use the vague and amorphous term “modernization” only to avoid mentioning such social economic systems as feudalism, socialism, and capitalism. Supporters of the modernization theory ignore the class nature of the Japanese state at its different stages of development. Such objective factors of human existence as class struggle and the contradictory interests of the bourgeoisie and proletariat do not exist for them. Vivid examples of the

Soviet japanologists cannot agree with such judgements. We believe the revolutionary nature of the history of Japan in 1867–1868 can be demonstrated. We try also to reveal the decisive role of the Japanese masses in these events. Soviet japanologists counter the arguments of the modernization theory by defining the Meiji Ishin as a revolution and by considering as an indivisible complex — not as a string of separate occurrences — such events as the state coup of 1867–1868 (initiated by samurai detachments from the southern domains of Satsuma, Chōshū, Tosa, etc.), the spontaneous peasant revolts, and the half-religious, half-anarchist rebellious activities of certain groups within the Japanese population, known to history as the Ee ja nai ka movement. Moreover, we see the main importance of the revolution in the people’s struggle against feudalism and foreign colonialism, not in the coup that resulted in a mere transfer of shogunal power to the emperor. In particular, we regard the peasant revolts as the most essential and decisive factor in the revolution. The spontaneous outbreak of peasant revolts in different parts of the country turned out to be the major driving force of the revolution, not only shaking and weakening the basis of the shogunate but forcing the monarchical government in power to eliminate the feudal regime and carry out agrarian reforms in order politically to stabilize its own rule. In our approach to the history of Japan of the late Tokugawa and early Meiji periods, with its bloody battles that shook the country before and after the uprisings of 1867–1868, we cannot forget that heavy battles were waged not only between the troops of the shogun and those of the emperor but also between feudal detachments and forces of the central government, on the one hand, and rebellious peasants on the other. Suffice it to say that between 1868 and 1873 about 200 peasant revolts took place in the country. In nearly all of them thousands or tens of thousands of people took part and military forces of considerable size were deployed to suppress them.²

In general, the intensity and scope of the struggle waged by the shogunate in support of the feudal system against the forces fighting for
its overthrow was much greater than is allowed by researchers who do not wish to see that those events constituted a revolution. It must be said that Japanese historians have made a great contribution to the proper understanding of the problem in the post-war period, showing that the most decisive role in the violent events of the Meiji Ishin was played by the common people, not by the upper strata of society. The Japanese historian Inoue Kiyoshi underlines the important role of the common people in the civil war of that period:

It is often said that the Meiji Ishin was carried out without bloodshed, but that is contrary to the facts. Of course, the former rulers' blood was not shed, as it was in some of the popular revolutions of other countries, when former monarchs were executed. But the Meiji Ishin must not be considered only a palace revolt carried out under the motto of the “restoration of the emperor's power.” The basis had been laid by bloody struggles over a year and a half before the said event. To the battles of that period, beginning with those of Toba and Fushimi and up until that of Hakodate, the government sent a total of 120,000 troops, of whom 3,556 were killed and another 3,804 wounded. Bakufu troops together with the clan forces supporting them lost 4,707 men.... The scale of those battles rivals that of the Sino-Japanese war. In that war the Japanese army totalling 120,000 officers and men lost 5,417 in action.... The basic and profound force that propelled history to this point were the masses....³

Soviet japanologists who pay special attention to the revolutionary nature of the Meiji Ishin do not consider themselves pioneers in this contention. We only confirm the judgement of these events made by progressive Japanese ideologists. For example, I quote here the words of the brilliant Japanese revolutionary and thinker Kōtoku Shūsui, who wrote in his treatise Shakai shugi shinzui (The Nature of Socialism) published in 1903:

Social history is a chronicle of revolutions. Revolutions result in the progress of mankind. Try to imagine what stage of development mankind would be in if there were no Cromwell in Britain; if American independence were not proclaimed, if the French people did not create the republican system; if Britain continued to be feudally disintegrated; if Italy were not unified; if there were no Meiji upheaval in Japan.⁴

Soviet japanologists, unlike many foreign scholars, consider the revolution of 1867–1868 a bourgeois revolution, which was not an exception among global natural phenomena. We think that the Meiji Ishin, like the bourgeois revolutions of Western Europe, initiated the transition in Japan from feudalism to capitalism. In formulating our viewpoint we draw on the experience of many countries, which shows us that the nature of any revolution is primarily determined by objective factors, such as the economic, social and political benefits gained by this or that class, and not by the social background or class affiliation of the leaders who stand at the head of the revolution. Our analysis of the consequences of the Meiji Ishin shows quite definitely that it was the beginning of Japan's transition from feudalism to capitalism, and that it was young members of the Japanese bourgeoisie who gained the real benefit from the conflicts of 1867–1868; the feudal forces had to adjust themselves to bourgeois norms in order to preserve their ruling position. This is vividly demonstrated by the agrarian reform of 1873, whereby the possession of land came to be determined not by feudal but by bourgeois law with its concept of land as private property that can be freely bought and sold. At this point it seems to me we cannot agree with our Japanese colleague, Professor Tōyama Shigeki, who writes in his important work Meiji Ishin (The Meiji Restoration), that the events of 1867–1868 were only a transition from one form of feudalism to another. In our view Tōyama underestimates the scope of the development of the capitalist structure in the feudal society of the Bakumatsu period. Nor does he reveal the contribution made by young members of the Japanese bourgeoisie (i.e. the banking and merchant houses of Mitsui, Kōnoike, Sumitomo, etc.) among opponents of the bakufu. Soviet japanologists are inclined to think that there were three leading forces engaged in the struggle against feudalism as embodied by the bakufu. Those forces pursued different goals and represented three different currents: the poor peasants and townspeople, who fought spontaneously against feudal rule without any clear political purpose in mind; the court nobility and samurai, who fought against the shogunate in order to establish absolute monarchy; and, finally, the emerging commercial and industrial bourgeoisie, which purported to be monarchist but was pursuing its own class goals for the future. The further the Meiji reforms went, the more real advantages and benefits were gained by bankers, merchants, and industrialists.

All this does not mean that Japan under Emperor Meiji was a one-class bourgeois society. Soviet japanologists regard it as a unity of power of the landlords and bourgeoisie, which in the nineteenth century was mainly influenced by landlords' interests. The absolute monarchy, with its relative independence in determining state policies, became a symbol of
the leading role of landlords in the ruling oligarchy. But this monarchy was not as absolute as that of the Bourbons in France or the Tudors in England, who were supported only by feudal landlords and the court nobility. It was another type of autocracy which expressed simultaneously the interests of the Japanese commercial, banking and industrial bourgeoisie. These are the main social consequences of the revolution of 1867–1868, to which we Marxists pay the greatest attention.

This does not mean, of course, that other aspects of life in countries experiencing revolutionary events do not interest us. Because it is a painful crucible of experience for the people, any country's revolution, including bourgeois revolutions, greatly influences the destiny of that country. It gives the people a new incentive for living, and spiritually rejuvenates and inspires them, arousing the most resolute and capable of them to action. The Japanese revolution is no exception. One of its important political results was the demonstration of the Japanese people's determination, including that of those heading the new government, to save their country from colonialism and to lead the way to independent development. We should respect the Meiji government for fulfilling the will of the Japanese people. On the other hand, the strengthening of bourgeois influence on state policy during the revolution intensified the activity of Japanese merchants, businessmen and intellectuals, an activity that found its reflection in feverish developments in education and culture, and in the rapid mastery by the Japanese of foreign achievements in science and technology. This was part of the Meiji government's drive to make the country part of world capitalist civilization, thus creating for itself a halo of wisdom, foresight, and progressiveness, though many aspects of the government's domestic and foreign policies do not support this image. The cultural reforms carried out in Japan in the Meiji era were truly great. We think that the main credit should go not to the emperor's court or the militarists but to the Japanese intellectuals who were resolute enough to sweep aside the old feudal outlook in favour of new, progressive ideas. Soviet japanologists have great respect for the activities and writings of such prominent Enlightenment thinkers as Fukuzawa Yukichi and Nakae Chōmin, whom we consider to be the best representatives of Japanese society of the Meiji era.

We should say, however, that Soviet japanologists are far from overestimating the historical significance of the Meiji epoch. E. M. Zhukov, H. T. Eidus and other Soviet scholars have often pointed out the fact that the revolution of 1867–1868 only began the transition in Japanese society from feudalism to capitalism. In spite of all the great changes in the country's life towards the end of the nineteenth century, the remnants of feudalism were not done away with until after the Second World War. The persistence after the Revolution of semi-feudal land ownership exposes the incompleteness of the Japanese bourgeois reforms. During the nineteenth and the first half of the twentieth century Japanese peasants remained under the landlords' yoke and were severely exploited in the pre-capitalist manner. The heavy burden of the remnants of feudalism was felt by working people in several ways, for example in the pre-capitalist practice whereby parents sold their daughters to the owners of factories and weaving mills, and in the extremely low wages of Japanese workers. In many cases the wages of Japanese workers did not differ much from those of workers in colonial countries.

The structure of the government and state policy also preserved obvious remnants of feudalism. The Meiji reforms did not eliminate but on the contrary strengthened such attributes of feudalism as the emperor's absolute power, the tennōsei. The reforms did not put an end to the privileges of aristocrats. The system of severe suppression of the civil rights and freedoms of the Japanese people by means of state power and the artificial implanting of Shinto as a state religion are vivid demonstrations of the anti-democratic, medieval spirit of the rulers.

Why did the revolution not develop further? What stopped the Japanese peasants from throwing off the yoke of the landlords? What prevented all the Japanese people from obtaining those elementary bourgeois-democratic rights which by that time had already been obtained by the peoples of Britain, France and other Western capitalist countries? The answer to these questions can be found in the behaviour of the participants in the coup. The court aristocracy, samurai, and, overshadowed by them, the merchants, bankers and businessmen did not want to fight for the complete elimination of feudalism. They did not want to side with the participants of the spontaneous peasant revolts, who had no clear political aims. The semi-religious and anarchic Ee ja nai ka movement became a vivid expression of the political immaturity of the peasant and urban masses. Neither the lower classes nor the Japanese bourgeoisie or small groups of intellectuals had at that time any clear revolutionary political programme. There was thus no revolutionary organization capable of expressing precisely the interests and claims of the classes suppressed by bakufu rule.

As for the samurai and aristocratic leaders of the coup, their aspirations became, in subsequent years, quite counter-revolutionary; they sought,
rather, to stabilize the situation. And that was why they showed resolution in suppressing sedition and peasant revolts without restricting themselves in the use of arms. As soon as their power had been consolidated, the adherents of the restoration of the Meiji emperor started intervening in the activities of the common people. And they succeeded in this matter little by little. Beginning in 1873 the peasant revolt started dying out, as a result of agrarian and other reforms, on the one hand, and suppression of the instigators of peasant revolts on the other. Consequently the further development of the revolution was brought to a halt. These are the reasons why Soviet japanologists call the Meiji Ishin not only a bourgeois revolution but also "an unaccomplished revolution." This term underlines specific features of Japan's development and shows that the revolution of the nineteenth century was interrupted half-way, as a result of which Japan retained numerous vestiges of medieval feudalism until the end of the Second World War.

None the less, as far back as the beginning of the twentieth century Japan became an imperialist state dominated by a monopolistic bourgeoisie. The contradictory foreign policy of Japan in the last quarter of the nineteenth and the first half of the twentieth century has its roots in the incomplete character of the bourgeois reforms undertaken by the Meiji government. On the one hand, the aim of creating a powerful armed force capable of repelling colonial aggressors agreed with the interests of the Japanese people. On the other hand, while the ruling class bloc represented by the landlords and bourgeoisie consolidated itself and enjoyed freedom of action as a result of the Meiji Ishin, there appeared new trends in Japan's foreign policy. Japan began to aim its foreign policy not only at the defence of its frontiers, but also at expansion and the invasion of other countries' territories. The Japanese military expeditions against Taiwan in 1874 and Korea in 1876 were the first demonstration of these trends. One of the most negative consequences of the unaccomplished character of the bourgeois revolution found expression in the growing influence of military-feudal extremists on the state and the political life of Japan, which in turn led to the militarization of the country and turned it at the end of the century into a hotbed of aggression dangerous to neighbouring peoples. The heroes of the Meiji Ishin, who had once defended the freedom of their motherland, later began to encroach upon other countries' independence, experiencing the same historic metamorphosis as the heroes of the Great French Revolution, Bonaparte and his comrades. The Meiji epoch brought not only national self-consolidation and progress to the Japanese people; it also was a period of growing imperialism and uncurbed militarism that brought incalculable calamities both to the Japanese people and to the peoples of neighbouring countries. That is why, in our evaluation of the reforms and developments of Meiji Ishin, we have to be most circumspect and take into account the duality of the Japanese state policy of that period, giving equal attention to both the positive and negative aspects of that policy.

Notes
THE RESTORATION AND THE HISTORY OF TECHNOLOGY

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When different cultures come into contact, understanding between them is initially sought through translation. This was true in the twelfth century when Europe encountered the scientific learning of the Islamic world. And it explains the significance of the publication in 1774 of Kaitai shinsho (The New Book of Anatomy) by Sugita Genpaku and Maeno Ryotaku, the first attempt to make Western science and technology accessible to the Japanese in general. This book was a translation of the Dutch version of a German work on anatomy by Johann Adam Kulmus. The Japanese found that the human body as described by Kulmus was quite different from that taught by traditional Chinese medical science, and they realized that Western anatomy was much more accurate. From the time the book appeared, the recognition spread that Western science explained the real world far better than Confucianism-centred Chinese learning, which until that time had been the mainstream of Japanese scholarship. Many people began to study Dutch, and there appeared a whole series of translations of Dutch works in different fields. Table 1 shows how this movement looks in figures.

Western medicine and pharmacology proved more effective in curing illnesses, so naturally they began to take the place of traditional medicinal practices, and numerous works on these subjects were translated. The subject of translated works second in popularity only to medicine was military science. Indeed, emphasis on the practicality of medicine and the growing interest in military concerns were characteristic of technology in the Bakumatsu period.

Why was there such great interest in military science? Plainly Japanese were impressed with Western military strength, demonstrated shockingly close to home by the defeat of China in the Opium War of 1840–1842 and the arrival off the coast of Japan of Commodore Perry’s fleet in 1853. China’s response to defeat in the Opium War was to build gunboats. The reason it had been defeated in the war, it concluded, was that it lacked sturdy steamships equipped with cannon. If it was to resist the West, China must have steam-powered warships as well. No time was wasted in establishing the Mai Shipyard in Foochow in southern China, and hiring Western engineers to build steamships. In central China, the Chiangnan Manufacturing Bureau was set up to manufacture various kinds of equipment and arms, and the organized translation of Western works on science and technology was begun.

Japan’s response was exactly the same. The view that the West excelled in cannon and shipbuilding technology was widely held immediately after the Opium War. The manufacture of Western-style cannon was begun soon afterwards, not only by the bakufu but by many of the domains, and although at this time only old-style bronze cannon were cast, the building of newer-style iron cannon was later planned in the Saga, Satsuma, and Mito domains, as well as in Nirayama, part of the shogunal lands. The common text used for all these projects was a work published in 1826 by a Dutchman, Ulrich Huguenin, entitled Het Gietwezen in 'sRijks IJzer-Geschutgieterij, te Luik. This book was concerned mainly

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### Table 1. Translation of Western works, 1720–1867

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Source: Ōtsuki Joden, Shinzen yōgaku nenpyō (New Almanac of Western Learning).
with the casting of iron cannon, but also gave detailed drawings and explanations of the building and operation of blast furnaces and of reverberating furnaces for smelting iron, as well as of methods of casting and boring the cannon body. Using various translations of this work by Tezuka Ritsuzō, Sugitani Yōsuke, and others, the domains attempted to build reverberating furnaces and to cast cannon.

The Saga domain in Kyushu completed its first reverberating furnace in 1850, and within the next two years had built two more. It used iron sand from Iwami (in present-day Tottori Prefecture), and charcoal for fuel. However, casting cannon solely on the basis of a written text proved extremely difficult, and it was a year and a half before a usable cannon was finally produced.

Following the arrival of Perry’s fleet, the bakufu determined to strengthen coastal defences, and it ordered fifty cannon from the Saga domain; these were finally completed in 1855. From 1864, rear-loading cannon began to be made in place of the outmoded front-loading cannon. Between 1843 and 1867, 346 Western-style cannon were made, but only 80 of these were iron; the rest were of bronze.

The Satsuma domain, also in Kyushu, built a reverberating furnace in 1853, but its first attempt failed. A second was built in 1856 and a third in 1857. Cannon manufacture in Satsuma was fairly successful, but, as with Saga, most of its output was bronze cannon. In the Mito domain, a reverberating furnace was built in 1855 by Ōshima Takatō (1826–1901) and others. Coal was used as fuel, and in order to secure a steady supply of iron ore, Ōshima built an iron mine at Kamaishi.

In developing the Kamaishi Iron Mine, Ōshima relied on the iron-making methods explained in Huguenin’s book, and this meant using a blast furnace, a method entirely different from the tatara process formerly used in Japan. In 1857, Ōshima built a firebrick furnace, with a base of granite, and made iron using charcoal. It was a small model, about 9 m high; the air supply was controlled by a bellows driven by a water-wheel. Each small furnace of this type achieved an annual output of 250 to 300 tons of pig iron.

In the Nirayama area of the Izu peninsula, a reverberating furnace was built by Egawa Hidetatsu (1801–1855) in 1855. However, the foundry had little success in casting cannon until experienced engineers were invited from Saga. Some cannon were made, but few were usable, and in 1864 the bakufu closed the ironworks and built a cannon foundry in Edo, concentrating its armaments manufacture there.

Second in importance to guns were steamships. A manual on steamship engines was translated at the order of Shimazu Nariakira (1806–1858), lord of the Satsuma domain, and an attempt to build a steamship was based on that work. The translation’s introduction stated that the Western nations could come and go freely anywhere in the world because they had guns and ships. Japan had already learned to make guns; now it must master Western methods of shipbuilding. On the basis of this text, the Unkōmaru was completed; it was tested in Edo but was not operable. Shimazu Nariakira launched efforts in several other industries, one of them glass-making: at its peak, ten furnaces and 100 workmen were involved in glass-making begun on his initiative. He also started spinning and weaving factories using water-powered equipment, and built ceramics, porcelain, leather-craft, and paint-making workshops, most of which were concentrated around the Iso coast of Kagoshima. There were as many as 1,200 workmen. The Dutch physician Pompe van Meerdervoort (1829–1908) was astonished by the flourishing industries he saw during a visit to Japan. Nariakira firmly believed that physics and science were the basis of the economy, and he sought to modernize the domain economy through the introduction of Western-style science and technology.

The lord of the Saga domain, Nabeshima Naomasa (1814–1871), brought in Western-style ships and planned the construction of a factory for ship repair; in 1857 machinery and equipment were ordered from the Netherlands. The equipment reached Saga the following year, but the actual building of the plant was frustrated by the straitened condition of Saga domain finances. The equipment was presented to the bakufu, but was not used. It was not until after the new Meiji government was formed that it was put to use. Nabeshima also set up an office in charge of metal refining and instituted research on steamships and steam locomotives as well as having model engines built.

As these examples show, the introduction of Western technology in the domains was carried out on the individual initiative of the local lords. They began with the premise that Japan had to have greater military capability, which would be acquired by possessing steamships and weapons that could resist the armed forces of the Western powers. Most of their efforts, however, were undertaken completely without regard to the state of domanial fiscal affairs, plunging provincial governments
promptly into severe financial difficulties. If the lord who had undertaken a project subsequently died, and a political upheaval occurred, policy vis-à-vis technological development might take a totally new direction.

Moreover, inflation was rampant in the latter years of bakufu rule, and the price of domestic resources rose steadily, meaning that the costs of self-development could only continue to rise. Production of a locally made 100 lb cast-iron cannon cost Satsuma as much as 500 ryō, more costly than a cannon imported from the United States. In addition, production was slow; one statement estimated the time necessary to build the required number of guns would be eight to nine years.

Political change was occurring at a rapid pace inside and outside the country during the Bakumatsu period, and efforts to build up military forces were being speeded up in response to the events accompanying that change. Ultimately, the domain governments abandoned the policy of gradual development and self-sufficiency, and began to import weapons and steamships. Taking advantage of their eagerness to obtain these goods, many merchants sold off to Japan outmoded firearms and ships from Europe and the United States. Nevertheless, both the local and central governments consistently sought to obtain the latest types of armaments, for it was an age when up-to-date armaments could mean the difference between winning and losing in the test of military strength. Some 200,000 Western firearms were imported.

Parallel to the domain-led movement promoting industry, mainly focused on the build-up of armaments, was the bakufu effort to nurture Western-style arms manufacture. There were six bakufu production facilities later taken over by the new Meiji government: the Sekiguchi Cannon Works (renamed the Tokyo Arsenal); the Ishikawajima Shipyard (later privately run as the Ishikawajima Hirano Shipyard); the Yokosuka Ironworks (Yokosuka Naval Arsenal); the Nagasaki Ironworks (Mitsubishi Nagasaki Shipyard); the ship repair equipment presented to the bakufu by Saga domain (Akabane Naval Arsenal); and gunpowder manufacturing equipment imported by Sawa Tarōzaemon (Itabashi Gunpowder Works).

Of these, the largest projects were the Yokosuka and Nagasaki Ironworks. Both had been built to construct ships, and foreign engineers were brought in to supervise their construction and operation. All the machines and equipment used were imported. This method, of bringing in from the advanced nations of the West engineers together with whole factories and related equipment, was a pattern widely followed by the Meiji government as well. It was the first attempt at a method which helped modern industry and technology become established in Japan at an early stage.

The Nagasaki Ironworks was built with Dutch assistance. As a result of the opening of the ports gained by Commodore Perry and his fleet, the bakufu had decided upon a policy of building a Western-style navy. The Netherlands immediately offered assistance for such a project, seeking to gain an advantage over the United States and other countries attempting to establish closer ties with Japan. In 1855, negotiations on the project were completed and a naval training school set up in Nagasaki. The first training corps from the Dutch army arrived and the Soembing, a ship with a 150-horsepower engine, was presented to Japan. Simultaneously, a plan for building a warship repair yard was drawn up and necessary equipment ordered from the Netherlands. In 1857 the equipment reached Nagasaki along with the second naval training corps. The leader of the team, Ridder Huijssen van Kattendijke, and engineering supervisor H. Hardes chose the site for the factory, and construction began under Hardes's direction. The foundry was completed in 1861. Made up of three divisions for forging, construction, and smelting, its major equipment included a 29-horsepower steam engine, 18 power lathes and a steam-hammer, the entirety costing the bakufu the huge sum of 58,000 ryō. Even after the training corps left, Hardes and ten others remained to provide instruction on technical matters. Sir Rutherford Alcock, the first British minister to Japan, and the Italian envoy V. F. Arminjon both highly praised the achievements of Hardes and the well-equipped shipyard. Alcock, in particular, believed that the Dutch would probably one day be blown up by a land-mine of their own building.

In 1863, the bakufu hired 14 more Dutch engineers and began building a shipyard to construct steam-powered warships. Again it imported the equipment from abroad. However, this project was taken over by the Meiji government and it was not until 1879 that the dock was completed.

In eastern Japan, the Yokosuka Shipyard was begun with a plan to obtain assistance from the French government. France encouraged Japan to build a shipyard near Edo and dispatched an army training corps to train the bakufu army in Western methods. It also sent an engineer named François Léonce Verny (1837–1908), who arrived in Japan in 1865 and immediately drew up a plan, proposing that an ironworks, intended for repairs, training, and on-the-job experience, should be built at
Yokohama and a full-scale foundry and shipyard (Yokosuka Seitetsujo) at Yokosuka; as a model he adopted the Toulon Shipyards of his own country. He returned briefly to France, came back to Japan in 1866 having procured the necessary engineers and machinery, and began construction immediately. Ground was broken for the No. 1 Dock in 1867. As a result of the upheaval surrounding the Restoration, the ironworks came into the possession of the new government in 1871, but construction had continued throughout the period, and in that year the No. 1 Dock was completed. At that time there were 43 French engineers working on the project. The shipyard made not only ships, but new modern-style lighthouses and equipment for mining. Verny finally left Japan in 1876.

The bakufu was not only receptive to aid from the Netherlands and France, but eager to obtain information about conditions abroad. In 1860 it sent a study mission of 77 people to the United States. The members of the mission made detailed records of what they observed of American civilization, realizing for the first time the existence of a civilization completely different from their own. A second mission, of 36 people, was sent to Europe in 1862, partly to conduct diplomatic negotiations, but also for the purpose of observing Western civilization and institutions. The members reported on the institutions, industry, arms, and other aspects they heard about and observed in each of the countries they visited. They were particularly anxious to learn about the military systems and arms industries of the West, and very detailed notes were made of the production systems and equipment at the Woolwich and Enfield Arsenals in England, where the Armstrong gun was made.

The route by which these missions sailed to and from Europe, moreover, led them from one colonial outpost to another, exposing them first-hand to the reality of Western expansion into Asia. What they saw filled them with both wariness and the clear recognition of what Japan would have to do to survive as an autonomous state. Many of the travel journals and personal accounts written by the members of these missions remain, and all of them include observations on the Western push into the East as well as the power struggles among the Western countries themselves in their scramble for hegemony. They saw that military strength and skill at diplomacy were the factors that determined the winner.

In 1864 Japan sent an envoy to France, and a diplomatic mission followed in 1865 to negotiate matters relating to the above-mentioned Yokosuka Seitetsujo (Yokosuka Ironworks). Again, for the International Exposition held in Paris in 1867, the bakufu sent, as well as another diplomatic mission, an immense collection of display articles from many fields, including agricultural products, textiles, dyed products, lacquerware, ceramic wares, paper, and books, assembled with the motive of pursuing new trade routes. The policy of choosing display items centred around traditional arts and crafts turned out to be useful in that it awakened awareness in the West of the existence of Japan. The same policy was followed by the Meiji government when Japan participated in the International Exposition in Vienna in 1873, the Philadelphia Centennial Exposition in 1876, and others, and the group of people who organized the Japan exhibition remained almost the same.

The nineteenth-century world expositions were showrooms for the merchandise of the participating countries. At the opening of the Paris exposition, Napoleon III declared that it was an occasion where the peoples of the world could compete in know-how and industry, just as the Greeks had once competed for athletic prowess in the Olympic Games.

The Paris exposition in 1867 was housed in a pavilion consisting of seven concentric oval structures. On the outermost perimeter were displayed products related to the machine industry, and the centre portion was devoted to art. Symbolizing the arrival of the age of steam power, all the power for the exposition site was provided by steam engines, together totalling 1,000 horsepower. And yet there were many electric-powered items on display, including telegraph mechanisms and electric beacons, prophesying the imminent arrival of a new age of electric power. Germany, a newly emerging state, displayed many items of military hardware, including a giant cannon weighing 50 tons made by the Krupp company, which astonished all who saw it.

The competition between the Western countries in the effort to achieve industrialization made a deep impression on the Japanese mission. Shibusawa Eiichi (1840–1931), who was to become a leader in the Japanese business world, was dumbfounded by the tremendous number of machines on display. He wrote that it was like playing in a dream world. But he was especially interested in the spinning machines, agricultural equipment, and scientific instruments from the United States and England. If the Japanese delegation was somewhat taken aback by the displays presented by the Western powers, it was comforted by the praise accorded the Japanese exhibition by the local press, which commented that it was the best prepared and organized of all the Asian countries, and applauded the beauty of its arts and craft products. It also became
better known in Europe that Japan was purchasing many steamships and that it was making great efforts to adopt Western inventions. The mission of which Shibusawa was a member, like those before it, also went to England, visiting the Woolwich Arsenal, the Times newspaper company, the Bank of England, and the Crystal Palace, as well as viewing military drills.

The bakufu's method of sending missions to observe and study conditions in the advanced countries and gather information was carried on by the Meiji government. The mission to the United States and Europe headed by Iwakura Tomomi (1825–1883), leaving Japan in 1871, is a good example. It was a large mission made up of about 50 members; among its leaders were central figures in the new government, including Iwakura, Kido Takayoshi (1833–1877), Ōkubo Toshimichi (1830–1878), and Itō Hirobumi (1841–1909). There were also among them many who had visited Western countries in the pre-Restoration period, and most of these were put in charge of the practical affairs connected with the mission. The average age of the members was 30, a generation receptive and flexible in its attitude towards other cultures. The Iwakura mission was accompanied by a group of 59 students on their way to take up studies in various parts of the United States and Europe. Estimates are that, at this time, about 500 Japanese had been abroad and seen Western civilization first-hand.

The members of the Yōsho Shirabesho translated the gist of commentary in foreign newspapers and presented these materials to the officials in the upper ranks of the bakufu. As a result, officials were also aware of the kinds of criticisms being levelled at the Japanese government by other countries. There were even times when they, too, assumed the position of critics operating within the establishment.

Language is one kind of skill, and just as the bureaucrats who rose by their language skills were capable of neutrality, engineers in production technology also began to rise into the technocracy. For example, Ōshima Takatō, who had built the first reverberating furnace in the Mito domain and had developed the Kamaishi Iron Mine, was a samurai from the Nanbu domain, and there were many other leaders in technology who directed their efforts far beyond the narrow interests of their own domains. Another such person was Takeda Ayasaburō (1827–1880), a bakufu official, who was prized by the bakufu as an expert on military technology, and was instrumental in the opening up of Hokkaido. He later returned to Edo, where he played a leading role in the manufacture of arms at the Sekiguchi Cannon Works and other arsenals. He did not, however, become involved in the struggle between the bakufu and anti-shogunal forces, firmly maintaining that his job was simply to manufacture arms, not to fight on the battlefield. He came under severe attack from some bakufu adherents, but retained his neutrality as a technocrat and later served as a member of the Meiji government.

A very different kind of personality, but also a technocrat, was Enomoto Takeaki (1836–1906). Enomoto was born of low samurai rank, but rose in the ranks of the bureaucracy in the achievement-oriented Bakumatsu period. He was among the second class of students graduated from the naval training school in Nagasaki and also went to the Netherlands for study. Unlike Takeda, he developed an intense sense of loyalty to the bakufu as one of the élite bureaucrats. After the fall of the shogunate and the defeat in the Hakodate war, however, he served the Meiji government as a technocrat. The majority of the former bakufu technocrats later became part of the new government.

It was only natural, then, that the course of industrialization of Meiji Japan as planned by these technocrats should follow roughly the same direction it had begun under the bakufu. All that had essentially changed was that the role of the bakufu was taken over by the new Meiji leaders. The political authority of these leaders, moreover, was not diffused as it had been under the decentralized system made up of numerous feudal
domains, but well-unified and concentrated in the hands of the central government.

This unity was characteristic of Japanese technology and industry after the Meiji Restoration. In order to solidify this unity and concentration of power, the government pressed for the completion of a national telegraph network and for the building of domestically made steam locomotives. Improvement of the speed and efficiency of the systems of transportation and the distribution of information was all conceived in terms of the framework of the state as a whole. In 1870 the Ministry of Public Works was established. Its purposes were research in engineering, promotion of industrialization, nationalization and management of mines, manufacture and repair of ships and shipping equipment, and building and running of the railway and telegraph systems. In all these endeavours, the West was made the model.

The Tokugawa policy of industrial development — that of reproducing models from the West and hastening the process as much as possible by bringing in engineers, factories, and machinery all together — was continued by the new government. Technology was imported in all kinds of fields, mainly by tapping the skills of the foreign specialists whom the government had hired to teach the Japanese. This approach extended even to building the framework of the state, its administrative and economic structure. One might say that Japan was, for intellectuals of nineteenth-century Europe, a kind of “laboratory state,” unlike any other they had come to know in Asia. Perhaps that is why most of those who came to Japan at the invitation of the Japanese government were among the most able men in their own countries. From the time of the International Exposition in London in 1862, it had become known that Japan was a country with a uniquely well-integrated cultural system which had never been interfered with by Europeans. The transplantation of Western civilization to such a country held a singular interest for many European intellectuals.

Many specialists in science and technology from the West sought to come to Japan, and Japan, for its part, accepted most of them without question. However, modern technology in the mid nineteenth century was still in its growth phase, and change and improvements were constantly going on. In shipbuilding, this was the time during which the materials were changing from all wood to wood and iron, and then again to all iron. Utilization of electrical energy was still in its infancy. Science and engineering were finally recognized as independent professions, and most technologies were growing through repeated processes of trial and error and experimentation.

Not only the Ministry of Public Works but also the Home Ministry, led by Ōkubo Toshimichi, developed a new policy under the slogan “increase production and promote industry.” In contrast to the Ministry of Public Works’ policy of complete reliance on Western models, the Home Ministry made agriculture its basis, seeking industrialization of the traditional rural handicrafts industries. Nevertheless, improvement in these industries, too, was achieved by introducing Western-style innovations. In agriculture, when the same method was adopted, it ended only in failure. Still, the system of agricultural experimental stations testing the effects of improved plant varieties and fertilizers later had a considerable beneficial effect. Improvements in the quality of raw silk, at that time the most important export product, were also attempted using French and Italian methods, and Japanese raw silk was highly praised at the International Exposition in Vienna in 1873. Later, French methods of silk reeling were combined with traditional reeling techniques in a new method that was widely used among small-scale silk manufacturers. The Home Ministry introduced Western methods in other fields such as weaving of woollen cloth and spinning, seeking to provide models that would promote improvement of indigenous techniques.

In 1877, taking the Paris and Vienna expositions as its models, the Home Ministry held the first large-scale national exposition in Japan in Tokyo’s Ueno district. The principle of competition in industry among nations as applied to the international expositions was adopted on the domestic level. There were more than 80,000 items on display and a total of 16,000 exhibitors, and there were 400,000 visitors. Many spinning and silk-reeling machines were on display, but all of them were driven by water power; the sole steam-powered machine was one built by the Public Works ministry. The exposition was a microcosm of a nation in the early stages of industrialization — candles, oil lamps, and gas lamps were displayed next to a Jacquard loom imported from France, and these only a step away from traditional looms. Expositions like this one were held with government sponsorship five times during the Meiji period, and they provided an important incentive to the expansion of industrialization throughout Japan.

Also important was the great effort concentrated on the teaching of engineering by both ministries. The engineering college (Kōbu Daigakkō) established by the Ministry of Public Works in 1877, the same year as the
national exposition, was an institution for advanced study specializing in engineering that boasted an ideal system for professional study unprecedented in the whole world. However, the cost of this programme was so high that within a few years it had to be suspended. Modern technology is such that it can be taught through a prescribed framework of education, and the fact that the system for teaching technology was built so quickly in Japan was largely due to the activities of the foreign specialists and advisers, who saw Japan as a nation for experiment. The educational system of the time, which emphasized the practical aspects of education, turned out to be effective in developing the industrial technology of Meiji Japan.

The above is but a brief sketch of the trends of technology in Japan in the period just before and after the Meiji Restoration. As far as technology is concerned, the Restoration occurred only in the political realm, and the movement towards modern industrialization, which had begun in the late Tokugawa period, was carried on by the Meiji government. The trend towards militarization and export had its beginnings in the Bakumatsu period, too, and continuity was provided by the upcoming technocrats.

The technology of the nationally run enterprises brought in by foreign specialists hired by the Ministry of Public Works and other parts of the government had been thought to be universally applicable, but after the Restoration a process of selection began, adapting that technology to the specific natural and social conditions of the country. It was finally understood that modern technology was by no means universal, but it did not become truly established and adapted to the Japanese environment until the beginning of the twentieth century.